Why are equity analysts so inaccurate in their target price forecasts? Empirical evidence from the Italian market.

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Abstract

Thousands of reports are published yearly by brokerage houses and investment banks, providing trading advice to investors and forecasts concerning the future market price of stocks (the so called target prices). Using a database of reports concerning blue chips listed on the Italian stock market, we have measured the forecasting ability of equity analysts in determining target prices. After having discovered considerable levels of inaccuracy, we have explored the weight of the various factors potentially affecting the accuracy of different analyst firms. More precisely, we have worked on two alternative assumptions: the *no-conflict hypothesis* (the analysts' errors are due to the intrinsic difficulty of the task) and the *conflict-of-interest hypothesis* (the analysts' errors are partly or mainly due to an optimistic bias aimed at securing/retaining investment banking clients or at boosting trading activity). In a context of generalised excessive optimism of equity analysts, our evidence supports the first hypothesis, showing even a certain over-pessimism of the most active traders and investment bankers.

JEL Classification: G14, G24

Keywords: stock recommendations, target price, equity analysts, conflicts of interest, forecast accuracy

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Introduction

Thousands of reports analysing the economic perspectives of listed companies are spread each year by major investment banks, brokerage houses and specialised research firms in all countries where a developed equity market exists. A typical equity research report contains – beyond a qualitative description of the methodology and the data used by the analyst – some typical summary information: the date of the report, the current market price of the analysed stock, a forecast concerning the future earnings of the firm, a target price and an investment recommendation. The latter three elements are particularly important for the readers of the report.

Earnings forecasts are especially analysed by investors in the US market, where listed companies have the habit of distributing dividends quarterly and where the level of this dividend distribution is analysed with a great deal of interest by investors who "read" earning surprises as very important pieces of information on the health of companies. In European markets, where the annual distribution of dividends is the norm and where the dividend policy of listed companies is under less intense scrutiny by investors, the earnings forecasts made by analysts are less influential and read as one of the many elements driving target price determination. The target price or fair value represents a forecast of the market price the stock should reach, according to the analysts' opinion, in the future. The forecast is usually referred to a 12-month time horizon, but not all analysts clearly specify this important aspect[1]. The recommendation is a trading advice given to the investor and is usually articulated in a 3-level ranking (buy, hold or neutral, sell). Some analysts use a 5-level ranking (strong buy, buy, hold or neutral, sell, strong sell), but the trend among the major actors in the sector is to move towards an homogenous 3-level ranking, which is less ambiguous for the investors and facilitates comparisons among different analysts' judgments. The buy (sell) recommendations are usually associated to a positive (negative) return on the stock higher than 10 per cent. Different analysts, however, use different criteria and scales for defining their recommendations. Consequently, the comparability of

[1] Very rarely, however, the analyst specify a time horizon other than 12 months. Thus, either the forecast is stated without a clearly specified time frame or it is presented as a 1-year-ahead price.

recommendations provided by different analyst firms is limited and requires some caution.[2]

Equity research reports are most often produced by research departments of investment banks and brokerage houses. Some major firms are active worldwide and publish reports on stocks listed on different national markets, other analysts are more focused on a single marketplace or a single industry. In any case the role played by independent specialised research firms is rather marginal. In fact, the revenue generating capacity of research activity tends to be quite limited. Most often the reports are offered to clients as a part of a packet of other financial services, cross-subsiding the research activity. This cross-subsidisation and the lack of independent research represent a fertile ground for conflicts of interest which can damage the quality and objectivity of the research produced. In particular, analysts may be under pressure to produce over optimistic reports either to gain or retain important investment banking clients or to boost trading and the related trading commission flow[3] or to push up the value of a stock overweighted in the proprietary portfolio of the intermediary.

During the last two decades equity analysts' activity has been put under intense scrutiny by the academic community and, in a few occasions, by the judicial authorities[4]. Academic literature has explored the phenomenon under three major perspectives. On one side, some researchers have tried to test and measure the ability of analysts to offer a valuable service to their client investors. Under this point of view many questions have been addressed: do the prices of stocks and the volume traded react to the issue of a new report changing the previous earning forecast or

[2] Not only the threshold of expected return that qualifies a recommendation as a buy varies from analyst to analyst, but also the very definition of this return. In some cases the definition is referred to an absolute level of return, in other cases it is referred to an expected over (under) performance relative to a market benchmark.

[3] The potential optimistic bias originating from the trading activity of the analyst firm is related to the difficulties and costs most investors experience in taking short positions, not only in less developed stock markets, but even in the leader Us marketplaces. Thus, a buy recommendation is likely to generate a greater flow of negotiations than a sell recommendation.

[4] The most famous and interesting case is the inspection led by Eliot Spitzer which resulted in the *Global Research Analyst Settlement* signed with the Securities Exchange Commission, in the year 2003, by ten major investment banks charged for inappropriate behaviours, due to conflicts of interest, in their research production and diffusion (Bear Stearns, Citigroup, Credit Suisse First Boston, JP Morgan, Lehman Brothers, Merryl Lynch, Morgan Stanley, UBS, US Bancorp Piper Jaffray).

recommendation or target price? If an abnormal return can be associated to the issue of a report, is it short-lived or does it produce a longer-term price drift in the direction forecasted by the analyst? Can investors profit from any abnormal return associated to the issue of a report through a feasible trading strategy?

The second line of research has explored the ability of equity analysts to provide accurate forecasts. Various accuracy metrics have been devised to measure and compare the forecasting performance of different individual analysts or brokerage firms. The major questions addressed under this point of view have been: are the equity analysts good or bad forecasters? Do analysts exhibit persistent differences in their forecasting ability? Which major factors affect the forecasting performance? Are investors able to recognise and reward the different forecasting ability of the analysts?

The third line of research has focused on the conflict of interest problem. As already mentioned above, there are many reasons to doubt the objectivity of analysts. In particular, there are important factors pushing the analysts towards an excess of optimism in their forecasts. Thus many researchers have been trying to prove the existence and the effects of the conflicts of interest. The issue has been explored under many different points of view: do analyst firms exhibit different degrees of optimism and which factors affect the relative optimism? Do the relative performance and accuracy of different analyst firms depend on the intensity of their investment banking and/or trading businesses? Do recommendations issued by affiliated versus unaffiliated intermediaries present different performance in the case of IPOs? Do the differential optimism of individual analysts affect their career perspectives? Do reputation concerns represent an effective counterbalance in reducing the bias due to the conflicts of interest?

This study belongs partly to the second and partly to the third line of research. Specifically, we focus our attention on the accuracy of analyst firms in their target price forecasts. We first measure the degree of accuracy through different alternative metrics. Having verified impressive levels of inaccuracy, we explore the weight of various factors potentially affecting the accuracy of different analyst firms. On one side, the errors made by analysts could just be explained by the intrinsic difficulty of forecasting a 1-year-ahead stock price, whatever the experience and the reputation of the analysts

firm. If so, bolder forecasts would be less likely to be met. Likewise, forecasts expressed during periods characterised by stronger market momentum would be associated to a larger degree of inaccuracy. Finally, due to the predominance of a good or bad "luck component", we should not verify persistent superior forecasting abilities or inabilities across our sample of analyst firms.

On the other side, the level of accuracy could be influenced by the exposure of the analysts to conflicts of interests. If this is the case, we would expect overoptimistic behaviour caused by investment banking or trading pressures to be associated with larger levels of inaccuracy. In the final part of the paper, we try to test the existence of a link between the level and features of the forecasting errors made by the analyst firms and proxies for their exposure to potential conflicts of interest, originating from their trading or investment banking activity.

This paper provides new contributions to the existing literature on the topic under different perspectives. First of all, the majority of papers is focused either on the earning forecasts or on the recommendations issued by equity analysts. The target price forecasts are far less explored, partly because this additional piece of information has been gradually added to the reports during the last decade and was not a standard beforehand. Furthermore, the few published papers focusing on the target price mostly analyse the price and volume impact generated by this additional forecast, but do not explore in depth the accuracy issue. Finally, an important differential aspect is the market context and the database on which the research is based. The majority of empirical studies is focused on the Us stock market and is based on the I/B/E/S database, provided by Thompson Financial. This study focuses on the Italian stock market and is based on a database compiled by the author through a text search of the analysts reports available in their integral version from the website of BorsaItaliana. Why is this market choice relevant and interesting? The Italian market is characterised by an important peculiarity. Indeed, Italian law imposes strong duties of disclosure for equity research reports published by banks and brokerage houses. More specifically, up to 1st April 2006, the disclosure obligation concerned all the equity research reports covering stock listed on the Italian market and published by financial intermediaries authorised to operate on the national territory. These reports had to be immediately

transmitted to the Consob (the public agency in charge of supervising the financial markets) and published within 60 days in their integral version through the website of the stock exchange, into an open access and free of charge section. Recently, the Italian regulation has been partially aligned to the European standard set by the Directive n.125/2003[5] and the disclosure duty has been restricted to the intermediaries acting as market makers for each stock, the lead manager and the co-managers in case of public and private offerings of stocks, the listing partner[6] in case of initial public offerings. Thanks to this peculiar regulatory environment, a large sample of analyst reports become public and can be easily cross compared, thus becoming susceptible to the critical ex-post scrutiny of investors and academics. The ability of various stakeholders to cheaply monitor the past accuracy of analyst firms may represent a disciplining device and prevent excessive optimism driven by conflicts of interest[7]. In other markets – and in particular in the US market – the reports are private information and the research databases are compiled by specialised information providers who collect the reports published by associated financial intermediaries[8]. The costs for consulting the database are not negligible and are not affordable by the general public of investors. Thus, the "research world" tends to be more opaque. This study tries to explore empirically if a greater transparency is effective or not in improving the accuracy and/or in diminishing the bias of the analyst firms.

Our evidence, despite showing impressive level of forecasting inaccuracy, provides weak support to the *conflict-of-interest* theory. The most active traders and

[5] The European Directive does not foresee a duty of public disclosure for the equity research reports and recommendations, which thus remains an Italian peculiarity. In fact, elsewhere only the clients of the intermediary have access to the reports, at the moment of the publication and afterwards. In order to ease the conflict of interest problem, the European Directive has focused the attention on various disclaimers and information to be specified in the reports, warning the investor against the risk of biased information and the potential conflicts of interest. Among this information, the intermediary has to specify the percentage of buy, neutral and sell recommendations issued during the most recent quarter, for all the covered companies and for the investment banking clients subgroup.

[6] The listing partner is an intermediary – foreseen by the internal regulations of BorsaItaliana – who is in charge of coordinating all the listing process and who will follow the company during the first stages of negotiations.

[7] According to game theory, in case of repeated interactions between agents, reputation becomes very valuable and the fear of loosing reputation acts as a powerful deterrent against opportunistic behaviour. A heightened disclosure should maximise the negative effect on reputation caused by forecasting inaccuracy and bias.

[8] The well-known and extensively used I/B/E/S database, provided by Thompson Financial, is characterised by these features. Even if the sample is very large, there is still a potential bias caused by the voluntary participation of the firms transmitting the reports. In the Italian case this bias does not exist.

investment bankers, even if somewhat less accurate than other analysts, do not seem characterised by an optimistic bias. On the contrary a negative correlation emerged between the sign of the forecasting errors and the intensity of trading/investment banking business. This evidence – partly contradicting what emerged in other papers on the topic – could indeed be the result of the peculiar regulatory environment characterising the Italian market. The heightened disclosure duties, in fact, potentially increase the reputation damage caused by the provision of biased forecasts, especially if too optimistic.

Literature review

As anticipated above, academic research on financial analysts' behaviour can be roughly subdivided into three main streams, labelled from now on as: the *profitability issue*, the *accuracy issue* and the *conflicts of interest issue*.

The papers focused on the *profitability issue* are aimed at analysing the market reaction following the release of a new report, especially when the report contains a revision in the earnings forecast or target price or recommendation. Most often attention is focused on the price impact (in terms of variously measured abnormal return of the stock price), but a few studies also explore the impact on the traded volume. Some papers concentrate on short-term market response, considering the days immediately before and after the issue of the report. Other studies analyse the longer-term price pattern of the stock, sometimes measuring the return obtainable through a trading strategy based on the analysts' advices.

The pioneer work of Womack (1996) documents a strong short-term abnormal return associated to recommendations upgrading and an even stronger impact of the recommendations downgrading, plus a longer-term price drift in the direction forecasted by the analyst. Various subsequent works have confirmed the short-term and longer term impact generated by a new report release, while exploring more in depth the combined and independent informative value of different parts of the report: the earning forecast and the recommendation (Francis and Soffer, 2003), the target price (Brav and

Lehavy, 2003), the strengths of the arguments proposed by the analyst (Asquith et al., 2005). Barber et al. (2006) examine the correlation between the profitability of stock recommendations and the rating distribution of different analyst firms. They find that – on the recommendation announcement day – there is not a significant difference in the market impact of reports released by analyst firms characterised by different degrees of optimism in their outstanding coverage. On the contrary, in the longer run, the abnormal return associated to upgrades (downgrades) issued by analyst firms with the greatest percentages of buys is lower (higher). Mikhail et al. (2004) find a positive correlation between the market reaction to a recommendation revision and the past performance of the individual analyst, both in the days immediately surrounding the announcement and in the longer run. Jegadeesh and Kim (2006) introduce an international perspective, comparing the market reaction to report releases in the G7 countries. They document significant short-term price reactions and post-revisions drifts in all countries, except Italy. The largest market reaction is observable in the United States and the authors attribute the gap to the higher skills of Us analysts in identifying mispriced stocks, after controlling for various alternative explanations.

Despite the overwhelming evidence of a significant market impact generated by analysts' forecasts revisions, most studies aimed at testing the profitability of various trading strategies based on them document very thin net abnormal returns, after transaction costs (see Barber et al., 2001; Mikhail et al., 2004)

The papers focused on the *accuracy issue* are aimed at measuring and comparing the forecasting ability of different individual analysts or analyst firms, exploring the main drivers of this ability (or inability) and its time persistence. Stickel (1992) documents a positive relation between earnings forecast accuracy and reputation, analysed using as a proxy the Institutional Investors' annual ranking called All-American Research Team. In the same paper the more reputable analysts also appear to produce a stronger impact on market prices when revising a forecast. Mikhail et al. (1997) find that a significant decline in the earnings forecast errors made by individual analysts as his/her firm-specific experience (measured in number of quarters since the first earnings forecast release) increases. Clement (1999) finds that earnings forecast accuracy is positively associated to analysts' experience and analyst firm size (seen as a

proxy of the resources available), while is negatively affected by the coverage scope, measured by the number of companies and industries followed.

Looking at the consequences of the forecasting ability for the individual analysts, Mikhail et al (1999) find a higher turnover probability for relatively poor earning forecasters. Similarly Hong and Kubik (2003) document a positive correlation between accuracy and positive career developments, like moving to a high-status brokerage house or being assigned to the coverage of more prestigious stocks.

The papers dealing with the *conflict of interest issue* try to test if the analysts potentially more exposed to distorting incentives do actually provide overoptimistic and biased forecasts. A few studies also analyse the capacity of investors to distinguish the "conflicted" analysts and appropriately "discount" their forecasts. Amongst the many papers belonging to this line of research, we can make two further distinctions. First, considering the potential source of bias, some authors focus on investment banking business, while others look also (or exclusively) at trading business. Second, when defining the profile of the conflicted analysts, some researchers just consider the firms releasing a report on an actual or recent investment banking client, while others consider all the firms having a relevant trading or investment banking business.

Michaely and Womack (1999) document a significant underperformance of the buy recommendations issued by affiliated brokers in case of IPOs, confirming the bias suspicion. Jackson (2005) and Cowen et al. (2006) compare the strength of different potential factors affecting the analysts' relative optimism: the underwriting activity, the trading business and the reputation. Both studies find that trading-generation incentives are as strong or even stronger than investment-banking incentives in determining research optimism. They also document the important role of reputation-building concerns as a counterbalance to analysts' opportunistic behaviours. Barber et al. (2007) document a significant lower abnormal return of buy recommendations issued by investment banks compared to other types of analyst firms (either brokerage houses or pure research firms). The opposite evidence emerges for hold and sell recommendations, suggesting a reluctance of investment banks to downgrade stocks whose prospects are deteriorating. Ertimur et al. (2007) document a strong positive correlation between earning forecasts accuracy and recommendations profitability.

Nevertheless this correlation doesn't hold when considering buy recommendations issued by analysts more exposed to conflicting incentives. They argue that, in these cases, the issuance of optimistic recommendations can be seen as a good revenue-boosting device, with low reputation costs, compared to the provision of inaccurate earnings forecasts. Thus, the best earning forecasters – when pressured by conflicting incentives – do not necessarily release the most profitable recommendations. Ljungqvist et al. (2007) find that analyst firms are more accurate and less optimistic when covering stocks largely owned by institutional investors. In fact, investment banking and brokerage pressures are – for these particularly visible stocks – counterbalanced by reputation costs of publishing biased research. Confirming the importance of reputation concerns, Kadan et al. (2008) document a reduced frequency and improved informative content of optimistic recommendations following some important regulatory changes aimed at establishing more stringent disclosure requirements on the research activity (NASD Rule 2711 and NYSE Rule 472).

Concerning the Italian stock market, there are a few working papers analysing the profitability issue (Belcredi et al., 2003; Cervellati et al., 2005 and 2007, Bonini et al., 2008b), the accuracy issue (Cervellati et al., 2008; Bonini et al., 2008a) and the conflict of interest issue (Cervellati and Della Bina, 2005). Some of these works are mainly aimed at verifying on the Italian market phenomena highlighted by the preceding literature on the topic. The results documented are quite similar to the ones described so far. Cervellati et al. (2005) challenge the evidence found by Jegadeesh and Kim (2006), by showing that the peculiarity of the Italian case disappears when considering the data available from the website of BorsaItaliana, instead of those provided by Thompson Financial. Our work is closer in spirit to Bonini et al. (2008a), even if we try to go further in depth in the understanding of the drivers explaining the target price forecasting accuracy of the analyst firms.

Sample description

The dataset used throughout this paper is made of 8,157 reports, published from the beginning of January 2004 to the end of March 2007. We decided to consider all the

equity research reports issued during the sample period and concerning stocks qualified as "Blue Chips" by BorsaItaliana on 2 January 2008[9]. In the Italian market the Blue Chips segment is comprised of all stocks having a market capitalisation greater than 1 billion euro. These companies represent the bulk of the market in terms of trading volume and are largely present in the institutional investors' portfolios. The choice to select this group of stocks is strictly linked to the focus of this paper: the target price forecast accuracy of analysts. Blue Chips are well known stocks, characterised by liquid and deep markets, wide analysts coverage and good information transparency. Thus, the forecasting activity should be relatively easier, compared to other types of stocks. Therefore, this context looks appropriate for analysing the issue of potential forecasting biases.

The final number of reports included in the dataset has been obtained after imposing some filters on the initial sample. First of all, given the objective of the research, all the reports not explicitly stating a target price have been eliminated. A by-product of this filter is an under representation of a few analysts who have not the habit of indicating explicitly this forecast[10]. Second, we have eliminated from the sample all analyst firms publishing less than 5 reports during the period taken into consideration on Blue Chips stocks, because their accuracy statistics would not be significative. Third, in case of two reports published by the same analyst firm, on the same stock, with unvaried recommendation and target price, with a time distance equal or lower than two working days, we have retained only the most recent one. Fourth, when analysing a report on a company listing both common and preferred stocks, we have exclusively considered the target price forecast on the common stock. Finally, we have eliminated all the "mirror reports"[11], considered as mere loading mistakes made by BorsaItaliana.

[9] The stocks listed into the Italian stock market, managed by BorsaItaliana spa, are subdivided in 4 different segments: Blue Chips, Star, Standard 1, Standard 2. The inclusion in the first segment (Blue Chips) is automatic and is linked to a market capitalisation threshold (1 bln. Euro). The inclusion in the Star segment is voluntary and the company willing to achieve this qualification needs to comply with some precise requirements in terms of transparency and corporate governance. Furthermore a market making system (called specialist), financed by the company, is required in order to insure a satisfactory level of liquidity. The stocks belonging to Standard 1 and 2 segments are characterised by thinner levels of liquidity and by modified trading rules, aimed at improving the price searching mechanisms.

[10] This is the case, in particular, for Banca IMI and Cazenove.

[11] We define "mirror report" a report having exactly the same data of another one in the sample, in terms of analyst firm, stock covered, date, target price and recommendation.

As already mentioned above, the final dataset contains 8,157 reports published by 30 different analysts, on 79 companies. Table 1 provides some descriptive statistics on sample reports by recommendation. In line with the evidence available on other stock markets, the total weight of the sell and strong sell recommendations is very limited (below 7 per cent). The majority of recommendations is concentrated in the "buy" category, immediately followed by the "neutral" category[12]. Looking more in detail at the neutral recommendations, in the greatest majority of the cases (slightly above 90 per cent) the target price stated by the analyst is above the current market price of the stock. Thus, the global impression and implicit advice given to the investor is more of a buy type, than a sell type. Summing up all the "positive recommendations" (defined as strong buy, buy and neutral recommendations with a ratio target price on current market price greater than 1), the total weight on the sample is 89.64 per cent and this right-skewed distribution is rather stable during the various years included in the sample. Thus, the idea of a widespread optimism characterising the analyst firms and the suspicion of a potential conflict of interest look quite confirmed. However, to be fair, we have to notice that the period taken into consideration is characterised by a bull market. A predominance of the optimistic forecasts is thus more than justified. To draw significant conclusions a comparison should be made with a bear period.[13]

Panel B, in Table 1, addresses the problem of the non homogeneous parameters used by different analyst firms in defining their recommendation scale. In order to draw a more precise picture of the recommendations distribution, we have introduced a modified classification criteria, by which we have transformed into strong buy (strong sell) all the buy (sell) recommendations having a target price more than 20 per cent

[12] We already mentioned above that different analyst firms often use different definitions for their recommendations and sometimes different scales (3-point scales vs. 5 point scales). There is as well a certain linguistic variety. For our analysis we have used the following conventions: (a) the recommendation "overweight" has been translated into "buy"; (b) the recommendation "buy" has been translated into "strong buy" if the analyst uses the "overweight" category in his classification; (c) the recommendation "underweight" has been translated into "sell"; (d) the recommendation "sell" has been translated into "strong sell" if the analyst uses the "underweight" category in his classification; (e) the recommendation "hold" has been translated into "neutral".

[13] At first glance, the situation doesn't seem very different in bear periods. Just a small piece of evidence: out of 900 reports, available from the website of BorsaItaliana for the same group of 30 blue chips taken into consideration in the rest of the paper, published during the period 1 July 2007 – 31 December 2007 (clearly a bear period, without perspectives of a quick resolution incumbent the sub-prime crisis), just 72 are sell or strong sell recommendations (8 per cent), 491 are buy or strong buy recommendations (54.56 per cent), 337 are neutral (37.44 per cent). Thus, the panorama doesn't look that changed. The evidence is too limited to be considered conclusive, nevertheless it seems quite interesting.

higher (lower) than the market price of the analysed stock two working days prior to the report release (Mp_{-2}). It is possible to observe how - using this modified classification - the weight of the strong buy category increases dramatically (from 7.06% to 44.49%), whereas the weight of the strong sell category remains quite unvaried. Beyond being right-skewed, the recommendations distribution is thus characterised by a large share of extremely optimistic forecasts. It is interesting to note that the mean ratio Tp/Mp_{-2} of the strong buy recommendations (using the modified classification criteria) is 1.4873. This means that, in 44.49% of our sample reports, the analyst was forecasting on average a 1-year return of about 50 per cent for a long position taken in the stock. The average of the same indicator on the entire sample is 1.269 (see Table 3), corresponding to an expected yield of return of 27 per cent. Even with a bull market background such a forecasts distribution sounds really optimistic and legitimates a bias suspicion.

Table 2 provides some descriptive statistics on the sample reports by analyst firm. First of all it is possible to observe a relevant dominance by a restricted group of brokerage houses providing intensive coverage to the Blue Chips stocks. The five most frequent report publishers are authors of almost 46 per cent of the sample reports and issue an average of 749 reports each (59 reports per quarter), over an average of 272 reports for the entire sample. Upscaling to the ten most frequent publishers, the share accounted for rises to 71.56 per cent of the total number of reports. The major five analyst firms are also characterised by a wider coverage (on average 44 companies covered each year, against an overall mean of 23) and a higher updating frequency of the analysts views (18 reports on average published per firm covered against a sample mean of 10 reports). Thus, the research field looks subdivided in two segments: a core group of analyst firms, providing a rich and well structured service to the client investors, and a plethora of minor players, issuing reports less regularly and on a more restricted number of stocks.

Panel A of Table 2 also permits to discuss the question of a domestic bias of the sample reports. Even if the majority of reports (60.61 per cent) is published by intermediaries mainly operating in Italy, the weight of international players in the sample is not negligible, though some major names are completely missing or

underrepresented.[14] On balance, the domestic bias of the sample does not look severe, considering that a certain predominance of national players is the rule in any market context.

Table 4 provides some statistics on the sample reports by covered company. Even if the total number of companies included in the sample is quite limited, they represent the bulk of the market, both under the point of view of capitalisation and turnover. The sample has a well balanced composition: even if the financial sector represents a larger share in terms of capitalisation, the total number of reports is fairly distributed across the three macro sectors (industrial, services, financial). On the contrary, the sample is a little tilted towards the larger caps. The 10 most intensely covered companies represent slightly over 30 per cent of the sample reports and almost 42 per cent of the sample capitalisation. However this degree of concentration should not affect the results of our tests.

Accuracy metrics

As already mentioned, the main focus of this paper is on the issue of accuracy. A first choice we had to make was to decide when to consider a forecast accurate and how to measure the forecasting errors made by the analysts. The existing literature on the topic basically uses two kinds of accuracy metrics. A few authors use a binary metric, distinguishing between accurate forecasts and failed forecast. In this case the forecast is considered accurate if the actual price falls within a predetermined interval around the forecasted price at the end of the forecasting period. The majority of authors use however a cardinal measure of the forecasting errors. In this case the forecasting error is usually measured by calculating the spread (sometimes in absolute value) between the actual price at the end of the forecasting period and the forecasted price, scaled by market price at the time of the forecast.

We have basically used both approaches, incorporating an additional point of view. We said before that most analysts present their target prices as 1-year forecasts. However, common sense dictates that it is extremely difficult for anyone to foresee a

[14] The most striking missing name is Morgan Stanley, but the weight of other important names – like JP Morgan – is quite limited.

stock price on an exact date 12 month away from the forecasting date. To address this concern, in the case of the cardinal metrics, we have computed a modified and more "generous" version of the forecasting errors by calculating the spread between the maximum (minimum) price touched by the stock during the year following the report issuance and the forecasted price, in case of recommendations having a Tp/Mp_{-2} above (below) 1. This accuracy metric may be interesting in ex-post analysis of the forecasting ability of the analyst, but the results obtained cannot be used to judge the potential return for a client investor following the analyst's advice, since it is clearly impossible to recognise ex-ante the moment a stock is reaching its maximum (minimum) level over a given period.

More specifically, for each report in the sample we have computed 6 different accuracy metrics:

AC_5pc	Accurate forecast if: $TP \times (1-0{,}05) < MP_{+365} < TP \times (1+0{,}05)$
AC_10pc	Accurate forecast if: $TP \times (1-0{,}1) < MP_{+365} < TP \times (1+0{,}1)$
TPE_12m_AV	$\frac{\lvert TP - MP_{+365} \rvert}{MP_{-2}}$
TPE_ANY_AV	If $Tp/Mp_{-2} > 1$: $\frac{\lvert TP - P.MAX_{12m} \rvert}{MP_{-2}}$
	If $Tp/Mp_{-2} < 1$: $\frac{\lvert TP - P.MIN_{12m} \rvert}{MP_{-2}}$
TPE_12m	$\frac{TP - MP_{+365}}{MP_{-2}}$
TPE_ANY	If $Tp/Mp_{-2} > 1$: $\frac{TP - P.MAX_{12m}}{MP_{-2}}$
	If $Tp/Mp_{-2} < 1$: $\frac{TP - P.MIN_{12m}}{MP_{-2}}$

where:

TP: target price;

MP_{-2}: official market price[15] of the stock 2 working days prior to the issue of the report;

[15] The official market price is a weighted average of the prices of all contracts negotiated on the stock throughout the entire trading session. In our analysis we have used a dividend-adjusted time series of official prices, kindly provided by ADB Dati Borsa.

MP_{+365}: official market price of the stock 365 days after the issue day of the report (or the first following working day, in case the date coincides with a closing day of the stock exchange);
$P.MAX_{12m}$: maximum official market price registered by the stock during the 12 months following the report issue date, i.e. before MP_{+365};
$P.MIN_{12m}$: minimum official market price registered by the stock during the 12 months following the report issue date, i.e. before MP_{+365}.

The first two metrics are simpler and belong to the binary "family". Having set a predefined tolerance (either 5 or 10 per cent) over and below the target price, they just subdivide the sample into two groups: accurate forecasts and failed forecasts. This leads to an excessively simplified analysis. In fact, especially when the tolerance is wide, an analyst can have a high percentage of accurate forecasts even in presence of a substantial average gap between the forecasted and the actual stock prices.

The other four metrics are of a cardinal type. Those in absolute value concentrate on the magnitude of the forecasting error made by the analyst, whatever the "direction" of this error. These metrics allow a measurement and a comparison of the mean accuracy over different analysts and over different periods, but the existence of a systematic bias in the forecasts issued is not so easy to judge. The latter two metrics, on the contrary, may be more useful under this second point of view. Considering how the metric is computed, a positive error always signals an excess of optimism in the forecast (either the price didn't raise as much as forecasted in the buy-type recommendations or the price decreased more than forecasted in the sell-type recommendations), whereas a negative error is generated by a pessimistic forecast. A right-skewed distribution of the forecast errors made by a certain analysts or during a certain period may be linked to latent conflicts of interest.

Table 5 presents some descriptive statistics on the sample mean levels of the above described accuracy metrics and on their average levels conditional on the ratio Tp/Mp_{-2} (Panel A) and on the recommendation given by the analyst (Panel B).

Overall the forecasting ability of the analysts appears very poor. Allowing a 5 per cent tolerance over and below the target price, only 15.36 per cent of the forecasts can be considered accurate. Even allowing a more generous tolerance of 10 per cent (which means a total interval of 20 per cent around the target price), the percentage of

accurate forecasts only rises to 29.52. The absolute magnitude of the forecasting errors is also impressive. The overall mean level of the indicator TPE_12m_AV is 30.16 per cent. In other words, the average difference between the target price and the actual price reached by the stock 1 year after the forecast is 30 per cent of the current market price at the time the forecast is made. The average level of the more clement TPE_ANY_AV is relevant as well: 24.88 per cent. Thus, even ignoring the time horizon of the forecast and taking into consideration the most favourable price reached by the stock in the direction forecasted by the analysts, the average error is around 25 per cent of the market price of the analysed stock. The level of the two final metrics (TPE_12m and TPE_ANY) is more reduced. At this very preliminary stage such a reduced overall level seems to indicate quite a balanced weight of the positive errors (excess of optimism) and the negative errors (excess of pessimism). While the overall mean TPE_12m has a positive sign (7.33 per cent), the mean TPE_ANY even shows a negative sign (-1.88 per cent), indicating a predominance of the pessimistic forecasts. Thus, there is no immediate evidence of a biased distribution of the forecasts. As explained above the incentives related to the conflict of interests would push to an excess of optimism aimed at boosting the trading fees or at securing investment banking clients. At this stage, however, forecasting errors would seem more related to the incompetence of the analysts (or, if we want to be more clement, to the intrinsic difficulty of forecasting a 1-year-ahead stock price) than to a conscious manipulation.

The forecasting errors made by the analyst firms appear strongly related to the level of ratio Tp/Mp_{-2}. We could summarise the evidence saying: the bolder the forecast in terms of difference between the target price and the current market price, the larger the error. Just 7 per cent of the forecasts are accurate in the fourth quartile of the ratio, against a 20 per cent accuracy share in the two intermediate quartiles and a 15 per cent in the first one (with a 5 per cent tolerance, but the picture looks very similar with a 10 per cent tolerance). Similarly the TPE_12m_AV and the TPE_ANY_AV have a much higher average level in the highest quartile of the ratio Tp/Mp_{-2} (respectively 46.68 per cent and 37.93 per cent), whereas the level is rather flat in the other three quartiles. To summarise, even if a little brutally: when the forecast made by the analyst is very optimistic, the investors should not be too excited in buying the stock, because the price will probably not fly that high. The described piece of evidence would – at first sight –

seem quite obvious: greater price fluctuations are less likely than smaller fluctuations, since the price movements tend to be normally distributed.

Quite a similar evidence emerges looking at the mean levels of the accuracy metrics across portfolios based on the type of recommendation given by the analyst (Table 5, Panel B). The most extreme types of recommendation (strong buy and strong sell) are characterised by lower percentages of accurate forecasts and by larger errors in absolute value. The TPE_12m and TPE_ANY indicators show that the analysts tend to exceed in optimism in their strong buys and exceed in pessimism in their strong sells. However the evidence concerning the strong sells should be taken with some caution given the quite limited number of observation available in this category (just 86, even using a modified classification system).

Table 6 presents some statistics on the mean forecasting accuracy of analyst firms. We have selected just two metrics: one binary (AC_5pc) and the other cardinal (TPE_ANY_AV). Analyst firms are presented in decreasing order of forecasting ability, based on the cardinal metric. Looking at the figures, a limited dispersion of both accuracy metrics emerges, except for the analyst firms publishing less reports (in these cases, however, the mean over a reduced number of observations can be clearly influenced by a few extremely good or extremely bad forecasts). The figures also show a relevant difference between the rankings based on the two different metrics. Some analyst firms almost constantly fail their forecasts, but not by a wide absolute margin. Others, who are more often accurate, tend to commit larger mistakes when they are wrong.

At first sight the analyst firms in our sample seem to possess quite similar (low) forecasting ability. The first impression seems confirmed by another type of analysis summarised in Table 7. After having subdivided our sample period in 13 quarters, we have tried to check if the better (worse) forecasters in a given quarter tend to be good (bad) forecasters in the following quarter as well. In each quarter the analyst firms have been ranked on the basis of TPE_ANY_AV. Then the mean accuracy level has been calculated for 3 sub-groups: the top 5 forecasters in the quarter, the second best 5 forecaster, the bottom 5 forecasters. For the analyst firms included in each subgroup various mean accuracy metrics have been computed for the following quarter, to check

if the differential forecasting ability persists or not. The analysis has been repeated by ranking the analyst firms on the basis of the AC_10pc. The results shown in Table 7 – pooled across quarter periods – are quite impressive. Apparently there is very limited persistence in the forecasting ability of the analyst firms. The relevant accuracy gap in a given quarter almost completely disappears in the following quarter and the performance of the three analysed subgroups is levelled. In fact the difference between the top forecasters and the worse forecasters is almost always not statistically different from zero in the subsequent quarter. In the only case where a statistical significance emerges (see Table 7, Panel A, third column) the t-statistic is very close to its critical value at the 5 per cent level. Thus, the forecasting ability of our sample analyst firms appears quite mean reverting. This evidence is in contrast with a few prior studies identifying significant time persistent differences in analysts' earnings forecast accuracy and stock picking ability (see Stickel, 1992; Sinha, Brown, Das, 1997; Clement, 1999, Mikhail et al., 2004). However Bradshaw and Brown (2006) – whose work is closer to ours – document a similar lack of persistence in the target price forecasting accuracy of equity analysts.

Explaining the forecasting inaccuracy

After having verified impressive levels of forecasting inaccuracy among the equity analysts, we have tried to explore more in depths the reasons of such systematic mistakes. A first possible explanation is linked to the intrinsic task difficulty. Forecasting a 1-year ahead equity price can almost be considered a "mission impossible", given the high volatility of the stock markets. Forecasting the quarterly earnings of a company is comparatively a much easier task for an analyst deeply knowing a sector and the management of the individual companies. A second possible explanation is linked to the conflict of interests potentially affecting the analysts' behaviour. Under this second point of view the mistakes could be explained by the mixed objectives of the analyst: not only being credible and providing a valuable service to the investors, but also pleasing the management of a potential investment banking client or driving the clients to buy more stocks (thus boosting the trading fees cashed by the brokerage house). In such a scenario the analyst could sometimes (or

often) purposely provide unrealistic forecasts. This behaviour would be more likely in a context where the reputation penalty for the forecasting inaccuracy is limited or absent. In theory a more transparent environment where the reports become public and are easily accessible – such as the Italian one – should increase the potential reputation damage of high and systematic inaccuracy levels.

If the mistakes made by the analysts are mainly due to the intrinsic task difficulty (we will call this the *no-conflict hypothesis* from now on), then we would expect larger mistakes when the price of the analysed stock experiences a sharp increase or decrease during the year following the forecasting date. Extreme price fluctuations – being less likely – are more difficult to predict. Likewise, large price movements preceding the report release could also be associated to larger mistakes, for a kind of "psychological bias" induced in the analyst, pushing him/her to endorse a enthusiastic or pessimistic market mood. For reasons already mentioned before, we would also expect bolder forecasts to be more frequently wrong. In other words, the target prices very far away from the current market prices would be less likely reached.

Coming to the peculiar features of each analyst, we would expect forecasting accuracy to be independent from the coverage scope. In fact, given the irrationality of the stock market and the difficulty of forecasting a future equity price, the strategy of investing research effort on a limited set of companies would not necessarily result in a higher accuracy level. Likewise we would expect the specific experience gained by an analyst firm on a company not to improve dramatically its forecasting ability. Finally, as again partially explored in the previous paragraphs, we would expect the past forecasting ability not to influence significantly the subsequent forecasting ability, given the predominance of a "luck" component, aside from the analysts' skill. In order to test the relevance of these factors, we have considered the following variables:

TP_MP	Ratio of the target price (TP) to the official market price of the stock 2 working days prior to the issuance of the report (MP_{-2})
EXTRA_REND	Difference between the log return of the stock during the year following the report release and the log return of the stock market index (S&PMIB) during the same period.
EXTRA_REND_AV	Absolute value of the EXTRA_REND variable.

MOMENTUM	Log return on the stock during the 6 months preceding the report issuance, calculated as log (MP_{-2}/ MP_{-180}).
COV_SCOPE	Number of stocks covered by the analyst during the year in which the report is issued.
COV_AGE	For each pair analyst firm - stock, time (in years) since the analyst firm first started the coverage, calculated from the older report available in the BorsaItaliana website, unless a gap longer than one year exists between two subsequent reports in the database. In this case the coverage is considered suspended and resumed at a later stage. The coverage age is calculated from the nearest resumption.
PAST_FORSCORE	Relative forecasting ability shown by the analyst firm publishing the report in the quarter preceding the report issuance. The relative forecasting ability is calculated following the methodology proposed by Hong and Kubik (2003). In each quarter the analyst firms are ranked on the basis of a predefined average accuracy metric (in our case the TPE_ANY_AV), taking into consideration all the reports published during the period. The best forecaster receives a rank equal to 1. A relative accuracy score is then calculated, according to the following formula: $$\text{REL\_FORSCORE}_{\text{quarter t}} = 1 - \left(\frac{\text{Rank}_{\text{quarter t}} - 1}{\text{Num\_An}_{\text{quarter t}} - 1} \right)$$ Where $\text{Num\_An}_{quarter\ t}$ is the number of analysts publishing at least two reports in the analysed quarter. Using this method, in each quarter, the best forecaster gets a score equal to 1, the worst forecaster a score equal to zero. For each analyst the PAST_FORSCORE coincide with the REL_FORSCORE calculated for the previous quarter.

To test the relationship of the described independent variables with the accuracy metrics calculated on each report, we have run various OLS regressions. The results are summarised in Tables 8 and 9.

Looking first at the absolute value of the forecasting errors made by the analyst firms, the size of both TPE_ANY_AV and TPE_12m_AV appear strongly and positively correlated to the TP_MP and EXTRA_REND_AV variables. As expected, the mistakes made by the analysts are larger when the forecast is aggressive or when the stock experiences a consistent price movement during the year following the report issuance (measured by the distance between the stock return and the market index return). These two factors appear to be the major elements explaining the forecasting

inaccuracy. The analysts tend also to make larger forecasting mistakes when evaluating stocks characterised by a strong momentum during the months preceding the report publication.

As already highlighted by the univariate analysis, the relative level of forecasting ability does not persist throughout the sample period and it does not represent a significant element in explaining the size of the errors made by the various analyst firms. COV_SCOPE has a positive statistically significant coefficient, even if the value of this coefficient is very low. Thus, the analysts covering a larger set of companies would seem more or less as accurate in their forecasts as those concentrating their research efforts on a more restricted group. Similarly, COV_AGE has a negative but very low coefficient, indicating that the experience matured by an analyst firm on a specific company does not significantly improve the forecasting ability. This evidence, which contradicts the standard theory of the learning curve, supports the idea that forecasting a future stock price is extremely difficult, whatever the skills and the specific knowledge possessed by the expert.

Looking at the sign of the forecasting errors made by the analysts – always under the *no-conflict hypothesis* – the evidence shown in Table 9 is quite similar. When the TP_MP is high, the price of the stock tends not to rise as much as foreseen and the forecasting error is positive (i.e. excess of optimism). The correlation is strong and highly significant under a statistical point of view. On the contrary when the stock has been characterised by a marked increase in the 6 months preceding the report release or when the stock price increases sharply during the following year, the forecasting error tends to be negative (i.e. excess of pessimism). Again the correlation is strong and statistically relevant. These 3 factors combined together explain a large fraction of the forecasting errors and the adjusted R^2 of the regression is above 0.70 for the TPE_ANY and above 0.93 for the TPE_12m[16].

The past forecasting performance is positively, but very weakly, correlated to the forecasting error. We could summarise this empirical result by saying that the best forecasters tend to be slightly over-optimistic in their subsequent research activity.

[16] In unreported tests we have tried to check if the mentioned results may be influenced by extreme levels of the TP_MP parameter characterising some reports in the database. To achieve this objective we have reduced the sample by eliminating the highest and lowest deciles of reports based on the TP_MP variable. We have then run the same OLS regressions, obtaining very similar results and comparable levels of adjusted R^2.

Similarly the coverage scope is weakly, but positively linked to the forecast error. The analysts who follow a wider portfolio of stocks would seem slightly overoptimistic in their forecasts. On the contrary, COV_AGE doesn't appear to be statistically related to the sign and magnitude of the errors.

In order to explore the alternative (or, maybe better, integrative) *conflict-of-interest hypothesis*, we had to devise some indicators able to proxy the intensity of investment banking and trading activity carried out by each analyst firm in our sample. Unfortunately, no official and periodical survey is available as far as the investment banking activity of the sample analyst firms is concerned, providing comparable data on the market share or the total revenue generated by this activity. Following a widespread solution adopted in academic studies on similar subjects, we have constructed a personalised proxy of the investment banking activity of our sample analyst firms, based on the data available on the IPOs carried out on the Italian stock market. The IPOs are clearly just a part of the investment banking activity, but admittedly a very important one, characterised by a high revenue-generating capacity. Furthermore, an intermediary deeply involved in the IPOs sector will most probably be involved in a good share of other investment banking deals carried out in the market.

For trading activity we had to face quite a similar lack of comparable and periodical data. The only available source of information was Assosim, a private and voluntary association to which the majority of our sample analysts belong and periodically provide data. Unfortunately the data on the trading activity of the Associates are released by Assosim on a annual basis, in a very summarised form and more detailed data could no be disclosed due to privacy agreements.

Having to cope with the described restrictions, we built the following two variables, aimed at proxying the investment banking and trading activity of each analyst firm:

IB_ACT	Percentage of IPOs in which the analyst firm has participated in the role of lead/co-lead manager or underwriter, calculated over the total number of IPOs carried out in the Italian stock market during the period January 2003 – December 2007.
TRADING_ACT	Percentage of negotiations intermediated on behalf of third parts by the analyst firm in Italian stock market, over the entire amount of negotiations

carried out by Assosim Associates, during the year preceding the report issue. In calculating this percentage the value (and not the number) of the deals has been taken into consideration. The TRADING_ACT variable could be computed exclusively for the analyst firms belonging to Assosim.

We have run again a series of regressions adding the described variables, in order to check if the size and direction of the errors made by the analysts depend on the intensity of investment banking and/or trading activity carried out (the *conflict-of-interest hyphothesis*). To check the quality of the results, we have used three different databases: (a) the entire set of reports available for the Assosim associates; (b) a database obtained by eliminating the highest and lowest deciles of reports based on the TP_MP ratio; (c) a database obtained by eliminating reports if another analysis has been published on the stock during the 3 preceding months by the same analysts and with the same target price. The aim of the two reduced database was to avoid that our conclusions could be driven by particularly aggressive forecasts or by forecasting mistakes on a few stocks been reiterated by the analyst in many subsequent reports[17].

The results of OLS regressions – detailed in Table 10 and 11 - are somewhat surprising. The absolute size of the errors made by the analysts seems positively correlated to both the trading and investment banking activities, even if in some specifications the estimated coefficients are not statistically significant. Thus, the most active traders and investment bankers would seem less accurate in their forecasting activity. The positive correlation is stronger when we exclude the most aggressive forecasts (columns 3 and 4, in Table 10) and when we reduce the reports' clustering (columns 5 and 6, in the same Table). The estimated coefficients are higher and statistically stronger for the trading activity than for the investment banking activity.

Up to here the evidence would seem in line with the *conflict-of-interest hypothesis*. However, when we observe the "direction" of the errors made by the analysts – in Table 11 – a negative correlation emerges between the forecasting errors and the trading/investment banking activity. Thus, the most active traders and investment bankers would seem characterised by an excess of pessimism – instead of

[17] To explain this latter concern, it is worth specifying that some reports are sometimes reiterated – with unchanged target price – many times during the same months. If an analyst has formed a wrong vision of a particular stock and this vision is reiterated many times in a short period of time, we risk overweighting a single forecasting mistake.

the expected optimism – in their (inaccurate) forecasts, contradicting the *conflict-of-interest hypothesis*.

Table 10 and 11 also explore the correlation between the COV_AGE variable and the size/direction of the forecasting errors. The specific experience matured by an analyst on a particular stock appears as a factor improving his/her accuracy (through a reduction of both the TPEANY_AV and TPE12m_AV indicators) and increasing his/her optimism bias. This evidence is in line with the results of other studies on the topic (Bradshaw et al., 2006; Cowen et al., 2006; Yonca et al., 2007).

Conclusions

Equity analysts are very inaccurate in the target price forecasts. Are they biased or just unable to foresee the stock price movements? Our evidence would point to the second direction, favouring what we called the *no-conflict* hypothesis over the *conflict-of-interest* explanation. Seen from another point of view, our evidence provides support to the theory of market efficiency, both in the weak and semi-strong form. In fact, the analysts seem quite unable to forecast whatever the specific experience accumulated in the valuation of a certain company and whatever the coverage scope i.e. the number of companies covered. The lack of persistent superior forecasting performance across our pool of analyst firms reinforces the *no-conflict* (efficient market) hypothesis and the impression of a predominance of random factors over the skills and the intentional manipulations of the researchers. Thus, professional analysis of publicly available information does not seem to provide a competitive hedge in producing more accurate forecasts.

The most active traders and investment bankers, even if somewhat less accurate than other analysts, do not seem characterised by an optimistic bias. On the contrary a negative correlation emerged between the sign of the forecasting errors and the intensity of trading/investment banking business. This evidence – partly contradicting what emerged in other papers on the topic – could be attributed to the peculiar regulatory environment characterising the Italian market. The heightened disclosure duties, in fact, potentially increase the reputation damage caused by the provision of biased forecasts, especially if too optimistic.

As usually happens, there are some potential weaknesses in our analysis. First of all, the proxies used to measure the intensity of investment banking and trading activity are not completely satisfactory. In the case of investment banking we have taken into consideration the IPO market, assuming it to be a key revenue driver in the field. However, a more precise measure of the role played by the investment banking activity over the total revenue for each analyst firm would be preferable. Unfortunately, it was impossible to collect comparable accounting data to compute such a measure. For the trading activity, we had to cope with very summarised data provided by Assosim, an association to which just a sub-sample of our analyst firms belong to. The summarised data on the trading activity were available on an annual basis and could not be subdivided per single share. More on the conflict of interest issue could have been learned by observing the relation between the analysts' optimism and their trading activity on particular stocks.

A second potential weakness lies in the overlap between different reports produced by the same analyst firm on a certain stock. If an analyst has formed a very inaccurate/accurate forecast and this is reiterated many times, we risk a bias in evaluating the forecasting ability of the analyst. As detailed before, we have used some devices to reduce the phenomenon, but to a certain extent to problem remains, even if our results indicate a substantial irrelevance of the problem.

There are a few related research questions which could be addressed in the future, building on the work done. First, an international comparison could be useful in order to check if the peculiar Italian legal environment is really relevant in reducing the conflict-of-interest issue and the consequent over-optimism of the analyst firms. An alternative explanation could, in fact, be linked to the heavy academic and journalistic campaign which has repeatedly addressed the problem during the last decade, discouraging market abuses. Second, our results could be double-checked in a bear market. The over-optimism driven by the conflicts of interest could be somewhat masked in a bull market by the continuous rally of stock prices. Finally, the research could be extended to stocks characterised by thinner capitalisation and more restricted analysts' coverage. Many papers on the topic have highlighted larger abnormal returns and abnormal volumes produced by the publication of a reports in these cases. Given the larger market impact,

the temptations linked to the conflict of interests could be stronger.

Table 1
Descriptive statistics on sample reports by recommendation (January 2004 - March 2007)

This table presents various descriptive statistics on analyst stock recommendations. Panel A details, by year, the number of recommendations issued on the sample stocks, the number of strong buy, the number of buy, the number of sell and the number of strong sell. The last column presents the average rating of the recommendations issued per year, calculated according to the following scale: strong buy = 5; buy = 4; neutral = 3; sell = 2; strong sell = 1. Panel B presents the average weight of each recommendation on the entire period taken into consideration (2004 – first quarter 2007). The weight is first calculated on the basis of the original recommendation written by the analysts. The weight is then recalculated translating in strong buy (strong sell) the recommendations where the target price is 20% higher (lower) than the market price of the stock two working days before the publication of the report. The need for this different classification originates from the non homogeneous classification methods used by the analysts. In fact, some use a 5-point scale, others a 3-point scale. Furthermore the definition of the various ranking brackets are not standardised. The line labelled "positive recommendations" presents the overall number and weight of the reports expressing an optimistic vision of the analyst through a strong buy, buy or neutral (with Tp/Mp >1) advice. Panel C presents, by year, the number of reports for which is available a previous report by the same analyst on the same stock in the sample, the number of upgrading to higher recommendations, the number of downgrades to lower recommendations, the number of reiterations of previous recommendations. The last column presents, by year, the average target price change in subsequent reports on the same stock.

Panel A: Descriptive statistics by year and type of recommendation

Year	Obs.	N. strong buy	N. buy	N. neutral	N. sell	N. strong sell	Average rating
2004	2.811	257	1.382	1.009	157	6	3.6165
2005	2.930	222	1.415	1.034	248	11	3.5461
2006	1.882	80	1.039	658	104	1	3.5813
2007 (first quarter)	534	17	253	227	37	0	3.4682
Overall	8.157	576	4.089	2.928	546	18	3.5734

Panel B: Descriptive statistics by type of recommendation (original and modified classification)

	Original classification		Modified classification		
Year	Obs.	In %	Average Tp/Mp	Obs.	In %
Strong Buy	576	7.06%	1,4697	3.629	44.49%
Buy	4.089	50.13%	1.1437	1.036	12.70%
Neutral	2.928	35.90%	1.1807	2.928	35.90%
with tp/mp>1	2.647	32.45%	1.1949	2.647	32.45%
with tp/mp<1	281	3.44%	1.0474	281	3.44%
Sell	546	6.69%	1.0218	478	5.86%
Strong Sell	18	0.22%	0.7359	86	1.05%
Positive recommendations	7.312	89.64%		7.312	89.64%
Overall	8.157	100%	1.2686	8.157	100%

Panel C: Descriptive statistics by type of recommendation revision

Year	Obs.	N. of upgrades	N. of downgrades	N. of reiterations	Average $\Delta Tp/Tp_{-1}$
2004	2.071	163	148	1.760	1.56%
2005	2.751	223	243	2.285	3.85%

2006	1.765	160	164	1441	4.95%
2007 (first quarter)	486	46	54	386	5.91%
Overall	7.073	592	609	5.872	3.60%
In % of the overall number of revisions	100%	8.37%	8.61%	83.02%	

Table 2
Descriptive statistics on sample reports by analyst firm (January 2004 - March 2007)

This table details the sample composition from the point of view of the analyst firms included. Table A subdivides the number of reports per analyst firm and per analyst type. The analyst firms are subdivided in two categories (domestic and international) on the basis of the headquarters location. In particular are defined as domestic the banks or brokerage houses whose headquarters and main activities are located in Italy. The last two columns detail the average number of companies covered by the analyst firms on a yearly basis (during the period Jan. 2004 – Dec. 2006) and the mean number of reports published on each covered company. Panel B presents the recommendation frequency by analyst firms, focusing the attention on the number and percentage weight (on total reports issued) of the buy and strong buy advices. The last column presents the average Tp/Mp level per analyst firm over the entire sample period analysed.

Panel A: Descriptive statistics on sample reports by analyst firm, analyst type and coverage scope

Name	Type	# reports	% reports	Average number of stocks covered	Mean number of reports per stock, per year
AbaxBank	Domestic	73	0.89%	12.33	5.92
ABN Amro	International	37	0.45%	5.33	6.94
Axia	Domestic	78	0.96%	19.33	4.03
Banca Akros	Domestic	462	5.66%	41.33	11.18
Banca Aletti	Domestic	19	0.23%	1.67	11.40
Banca Finnat	International	6	0.07%	2	3
Banca Leonardo	Domestic	496	6.08%	30.33	16.35
BNP Paribas	International	10	0.12%	0.67	15
Caboto	Domestic	528	6.47%	43.33	12.18
Cazenove	International	24	0.29%	5	4.80
Centrosim	Domestic	311	3.81%	32	9.72
Chevreux	International	86	1.05%	23	3.74
Citigroup	International	384	4.71%	27.67	13.88
CSFB	International	81	0.99%	10	8.10
Deutsche Bank	International	1,029	12.61%	36.67	28.06
Dresdner	International	23	0.28%	4.33	5.31
Euromobiliare	Domestic	821	10.06%	53.67	15.30
Exane BNP Paribas	International	24	0.29%	4.67	5.14
Goldman Sachs	International	155	1.90%	13	11.92
ING	International	202	2.48%	20.67	9.77
Intermonte	Domestic	761	9.33%	43.33	16.79
JP Morgan	International	57	0.70%	7.33	7.77
Kepler	International	139	1.70%	26.67	5.21
Lehman Brothers	International	242	2.97%	18.67	12.96
Mediobanca	Domestic	236	2.89%	36.33	6.50
Merril Lynch	International	390	4.78%	26.67	14.63
Rasbank	Domestic	308	3,78%	30	10.27
UBM	Domestic	605	7.42%	40.67	14.88
UBS	International	361	4.43%	31.33	11.52
Websim	Domestic	209	2.56%	37	5.65

Total number of reports		8,157	100%		
Total reports published by domestic firms		4,907	60.61%		
Mean		271.9		22.90	10.26
Top 5	Total number of reports: 3,744 Percentage of reports: 45.90% Average number of reports per analyst firm: 748.8 Mean coverage scope: 43.93 Mean number of reports per stock covered, per year: 17.44				
Top 10	Total number of reports: 5,837 Percentage of reports: 71.56% Average number of reports per analyst firm: 583.7 Mean coverage scope: 37.70 Mean number of reports per stock covered, per year: 15.48				

Panel B: Descriptive statistics on sample reports by analyst firm and recommendation

		Original classification		Modified classification			
Name	# reports	N. buy	N. strong buy	N. buy	N. strong buy	% buy and strong buy	Average Tp/Mp
AbaxBank	73	37	0	21	16	50.68%	1.13
ABN Amro	37	24	0	0	24	64.86%	1.34
Axia	78	47	1	10	37	61.54%	1.28
Banca Akros	462	192	57	74	118	53.90%	1.24
Banca Aletti	19	11	0	3	8	57.89%	1.22
Banca Finnat	6	3	0	2	1	50.00%	1.13
Banca Leonardo	496	199	0	46	153	40.12%	1.22
BNP Paribas	10	9	0	0	9	90.00%	1.50
Caboto	528	149	71	50	99	41.67%	1.25
Cazenove	24	13	0	0	13	54.17%	1.40
Centrosim	311	155	0	28	127	49.84%	1.32
Chevreux	86	69	0	12	57	80.23%	1.32
Citigroup	384	223	0	78	145	58.07%	1.19
CSFB	81	41	0	4	37	50.62%	1.33
Deutsche Bank	1,029	624	1	124	500	60.74%	1.32
Dresdner	23	15	0	0	15	65.22%	1.39
Euromobiliare	821	360	202	94	266	68.45%	1.30
Exane BNP Paribas	24	17	0	2	15	70.83%	1.31
Goldman Sachs	155	72	0	31	41	46.45%	1.18
ING	202	109	0	21	88	53.96%	1.26
Intermonte	761	367	116	44	323	63.47%	1.31
JP Morgan	57	38	0	12	26	66.67%	1.20
Kepler	139	107	0	33	74	76.98%	1.27
Lehman Brothers	242	138	0	36	102	57.02%	1.26
Mediobanca	236	157	0	37	120	66.53%	1.28
Merril Lynch	390	288	0	106	182	73.85%	1.23
Rasbank	308	140	6	34	106	47.40%	1.22
UBM	605	260	91	103	157	58.02%	1.24
UBS	361	122	0	11	111	33.80%	1.23
Websim	209	103	31	20	83	64.11%	1.33
Overall	8,157	4,089	576	1,036	3,053	57.19%	1,27

Table 3
Statistics on target prices

This table provides descriptive statistics on the target prices included in analyst reports. In particular the table presents general distributional statistics on: a) the ratio of target price to preannouncement market price of the stock (stock price outstanding 2 days prior to the issuance of the report), denoted as Tp/Mp; b) the percentage change in the analyst firm target price in case of recommendation revisions, denoted as $\Delta Tp/Tp_{-1}$

	Tp/Mp	$\Delta Tp/Tp_{-1}$
# Observations	8,157	7,073
Mean	1.269	0.0358
Max	5.506	3.48
75th percentile	1.339	0.0538
Median	1.219	0
25th percentile	1.117	0
Min	0.308	-0.8730
Std. Dev.	0.315	0.1392

Table 4
Descriptive statistics on sample reports by covered company

This table provides descriptive statistics on the sample from the point of view of the companies covered by the analysts. The first part of the table compares the sample (Blue Chips companies) to the overall listed shares in the BorsaItaliana exchange, looking at the number of companies, the total market capitalisation and turnover, the number of initial public offerings. The second part of the table looks at the composition of the sample under the point of view of the macro sectors represented (industrial, services, financial). The third part explores the issue of sample concentration, providing a few statistics on the 10 most represented companies in the sample in terms of number of reports published.

	Overall market	Sample	Sample in %
N. of companies (at 31st Dec. 2007)	275	79	28.73
Turnover (in mln. Euro, year 2007)	254,263	206,887	81.37
Capitalisation (in mln. Euro, at 31st Dec. 2007)	874,502	775,507	88,68
N. Ipo (Jan 2004 – March 2007)	49	11	22.45
Sample statistics by macro sectors	Industrial	Services	Financial
N. of companies	23	27	28
% on total sample companies	29.11	34.18	35.44
Capitalisation (in mln. Euro, at 31st Dec. 2007)	161,475	279,983	393,056
% on total sample capitalisation	18.46	32.02	44.94
N.number of reports	2,787	3,239	2,131
% on total sample reports			
Sample concentration	10 most covered companies	Sample	Top 10 in %
N. of reports	2,471	8,157	30.29
Capitalisation (in mln. Euro, at 31st Dec. 2007	366,518	874,502	41.91
Turnover (in mln. Euro, year 2007)	135,322	254,263	53.22

Table 5
Statistics on forecast accuracy conditional on the ratio Tp/Mp_{-2} and recommendation

This table presents the mean levels of various measures of target price accuracy across sub-samples based on the ratio target price to preannouncement market price (Panel A) and on the type of recommendation the report is associated to (Panel B). In order to make the recommendations more comparable, a modified classification system is adopted by which all the reports with a buy (sell) recommendation having a ratio Tp/Mp_{-2} higher than 1.20 (lower than 0.8) are transformed into strong buy (strong sell). This revised classification is mainly aimed at transforming into a 5-point ranking the recommendation system of those analysts who use a 3-point ranking. The indicator TPE_12m is calculated as the difference between the target price stated by the analyst and the market price reached by the stock one year after the issuance of the report, divided by the preannouncement market price of the same stock $[(Tp-Mp_{+365})/Mp_{-2}]$. A positive TPE_12m indicates that the forecast made by the analysts was too optimistic (the price didn't rise as much as forecasted or decreased more than forecasted). The indicator $\left|\text{TPE\_12m}\right|$ is the absolute value of TPE_12m. The indicator TPE_any is calculated as the difference between the target price stated by the analyst and the maximum price (if the Tp/Mp_{-2} was higher than 1 at the issuance of the report) or the minimum price (if the Tp/Mp_{-2} was lower than 1) reached by the stock during the year following the issuance of the report, divided by the preannouncement market price of the same stock $[(Tp-Mp_{max/min})/Mp_{-2}]$. The indicator $\left|\text{TPE\_any}\right|$ is the absolute value of TPE_any. The indicator AC_5pc represents the percentage of accurate target price forecasts within the sub-sample. In this case the forecast is defined as accurate if the stock market price 1 year after the issuance of the report falls within an interval of 10 per cent centred on the target price $[Tp \times (1-0{,}05) < Mp_{+365} < Tp \times (1+0{,}05)]$. The indicator AC_10pc is very similar to the previous one, but in this case the forecast is defined as accurate if the stock market price 1 year after the issuance of the report falls within an interval of 20 per cent centred on the target price $[Tp \times (1-0{,}1) < Mp_{+365} < Tp \times (1+0{,}1)]$.

Panel A: Mean values across portfolios based on the ratio Tp/Mp_{-2}

Tp/Mp_{-2} quartile	Tp/Mp_{-2}	AF_5pc	AF_10pc	TPE_12m_AV	TPE_ANY_AV	TPE_12m	TPE_ANY
1	1.0153	0.1550	0.2908	0.2766	0.2147	-0.1458	-0.1572
2	1.1684	0.1985	0.3706	0.2296	0.2061	-0.0025	-0.1556
3	1.2738	0.1908	0.3556	0.2333	0.1951	0.061	-0.0487
4	1.6168	0.070	0.1638	0.4668	0.3793	0.4031	0.2864
Overall	1.268	0.1536	0.2952	0.3016	0.2488	0.0733	-0.0188

Panel B: Mean values across portfolios based on the recommendation (modified classification)

Recommendation	AF_5pc	AF_10pc	TPE_12m_AV	TPE_ANY_AV	TPE_12m	TPE_ANY
Strong Buy	0.1342	0.2673	0.3446	0.3752	0.2459	0.0998
Buy	0.1892	0.3378	0.2502	0.2534	0.1476	0.0222
Neutral	0.1704	0.3204	0.2638	0.2346	-0.0151	-0.0961
with tp/mp>1	0.1700	0.3234	0.2615	0.2478	0.0024	-0.1151
with tp/mp<1	0.1744	0.2918	0.2861	0.1096	-0.1796	0.0831
Sell	0.1381	0.2866	0.2942	0.1608	-0.1852	-0.0363
Strong Sell	0.0581	0.1512	0.4283	0.1509	-0.0958	-0.0150

Table 6
Statistics on forecast accuracy by analyst firm

This table presents the mean level of two accuracy metrics (TPE_ANY_AV and AF_5pc) by analyst firm over the entire sample period. The "Ranking TPE_ANY_AV" and "Ranking AF_5pc" columns present the ranking of the analyst firms based on each accuracy metric: the rank 1 is given to the analyst performing better. The analyst firms are ordered in increasing order of their TPE_ANY_AV ranking.

Name	# reports	TPE_ANY_AV	Ranking TPE_ANY_AV	AF_5pc	Ranking AC_5pc
Banca Finnat	6	0,1211	1	0,1667	10
BNP Paribas	10	0,1373	2	0,2000	4
JP Morgan	57	0,1399	3	0,1053	25
Banca Aletti	19	0,1491	4	0,0526	30
Citigroup	384	0,1733	5	0,2083	2
Goldman Sachs	155	0,1759	6	0,1097	24
Banca Leonardo	496	0,1951	7	0,1794	6
Exane BNP Paribas	24	0,1991	8	0,2500	1
Merril Lynch	390	0,2021	9	0,1667	11
ABN Amro	37	0,2046	10	0,0541	29
Dresdner	23	0,2075	11	0,0870	26
Kepler	139	0,2178	12	0,1871	5
CSFB	81	0,2217	13	0,1235	22
Lehman Brothers	242	0,2228	14	0,1405	18
UBS	361	0,2236	15	0,1302	21
Centrosim	311	0,2367	16	0,1704	9
ING	202	0,2373	17	0,1733	7
Axia	78	0,2387	18	0,1410	17
Rasbank	308	0,2390	19	0,2013	3
Mediobanca	236	0,2456	20	0,1229	23
Chevreux	86	0,2464	21	0,0581	28
Cazenove	24	0,2484	22	0,0833	27
Deutsche Bank	1,029	0,2636	23	0,1555	13
Banca Akros	462	0,2670	24	0,1710	8
Caboto	528	0,2672	25	0,1553	14
Euromobiliare	821	0,2723	26	0,1376	19
UBM	605	0,2771	27	0,1322	20
Intermonte	761	0,2995	28	0,1445	16
Websim	209	0,3241	29	0,1579	12
AbaxBank	73	0,3525	30	0,1507	15
Overall	8,157	0.2488		0.1536	

Table 7
Persistent ability of analyst firms to accurately forecast target prices

This table presents the subsequent forecasting accuracy of analyst firms conditional on their past level of forecasting ability. The sample period has been divided in 13 quarters. In each quarter the analyst firms have been ranked on the basis on one of the accuracy metrics used in this paper (TPE_ANY_VA in Panel A, AC_10pc in Panel B). Then the mean accuracy level have been calculated for 3 sub-groups: the top 5 forecasters in the quarter, the second best 5 forecaster, the bottom 5 forecasters. For the analyst firms included in each subgroup various mean accuracy metrics have been computed for the following quarter, to check if the differential forecasting ability persist or not. In each quarter the analyst firms have been included only if issuing at least 2 reports. The results presented in the two Panels are pooled across quarter periods. T-statistics in brackets for statistical significance of the difference Top-Bottom. *: two-tailed probability < 0.05; **: two-tailed probability < 0.01.

Panel A: Subsequent performance of analyst firms ranked on the basis of the TPE_ANY_AV accuracy metric

	TPE_ANY_AV Quarter t	TPE_ANY_AV Quarter t+1	AC_10pc Quarter t+1	AC_5pc Quarter t+1	TPE_ANY Quarter t+1
Top 5	0.1435	0.2125	0.3124	0.1293	-0.0111
Second 5	0.1939	0.2026	0.3373	0.1435	-0.0411
Bottom 5	0.3481	0.2588	0.2541	0.1298	-0.0326
All	0.2292				
Diff. Top - Bottom	-0.2046**	-0.046*	0.058	-0.0005	0.0215
	(-7,18)	(-2,05)	(1,19)	(0,72)	(-0,054)

Panel B: Subsequent performance of analyst firms ranked on the basis of the AC_10pc accuracy metric

	AC_10pc Quarter t	AC_10pc Quarter t+1	TPE_ANY_AV Quarter t+1	TPE_ANY Quarter t+1	AC_5pc Quarter t+1
Top 5	0.5127	0.3222	0.2334	-0.0411	0.4237
Second 5	0.3506	0.3181	0.2096	-0.0410	0.2655
Bottom 5	0.1074	0.2536	0.2209	-0.0435	0.4330
All	0.3036				
Diff. Top - Bottom	0.4053**	0.0685	0.0125	0.00233	-0.0092
	(9,46)	(1,33)	(0,38)	(0,51)	(-0,054)

Table 8
Factors affecting the absolute value of the forecasting errors made by the equity analyst firms: the no-conflict hypothesis

This table presents the results of estimating the following OLS regression: $|\text{TPERROR}|_{i;j;t} = \alpha_0 + \alpha_1 \times \text{TP\_MP}_{i;j;t} + \alpha_2 \times \text{EXTRA\_REND\_VA}_{i;(t,t+365)} + \alpha 3 \times \text{MOMENTUM} +$

$+ \alpha_4 \times \text{PAST\_FORSC ORE}_{j;t} + \alpha_5 \times \text{COV\_SCOPE}_{j;t} + \alpha_6 \times \text{COV\_AGE}_{i;j;t} + \varepsilon_{i;j;t}$

where the variables are defined as follows: $|\text{TPERROR}|_{i;j;t}$: cardinal measure of the absolute forecasting error (TPE_ANY_AV in Panel A e TPE_12m_AV in Panel B) made on the report published at time t, by the analyst firm j, on the stock i; $\text{TP\_MP}_{i;j;t}$: ratio of the target price (TP) to the official market price of the stock 2 working days prior to the issuance of the report (MP_{-2}); $\text{EXTRA\_REND\_VA}_{i;(t,t+365)}$: difference, in absolute value, between the logarithmic return of the stock during the year following the report release and the logarithmic return of the S&PMIB stock index during the same period; MOMENTUM: logarithmic return of the stock i during the 6 months preceding the report release; $\text{PAST\_FORSCORE}_{J;t}$: lagged relative forecasting performance of the analyst firm j, referred to the quarter preceding the report issuance; $\text{COV\_SCOPE}_{J;t}$: total number of stocks covered by the analyst firm j during the year t; $\text{COV\_AGE}_{i;j;t}$: time (measured at time t, in quarters and fractions of quarter) since the beginning of coverage on the stock i, by the analyst firm j; $\varepsilon_{i;j;t}$: assumed normally distributed error term with zero mean and constant variance. T-statistics in brackets under the estimated coefficients. *: two-tailed probability < 0.05; **: two-tailed probability < 0.01. White heteroskedasticity-consistent standard errors and covariance.

Dependent variable: TPE_ANY_AV

Independent variables	(1)	(2)	(3)	(4)
Intercept	-0.5595 **	-0.5058 **	-0.5713 **	-0.6163 **
	(-29.74)	(-24.83)	(-25.20)	(-30.17)
TP_MP	0.5165 **	0.48449 **	0.4788 **	0.51135 **
	(36.58)	(32.83)	(32.26)	(36.08)
MOMENTUM	0.3146**	0.3029**	0.3003 **	0.3139 **
	(6.54)	(6.00)	(5.97)	(6.54)
EXTRA_REND_AV	0.6821***	0.6928 **	0.6971**	0.6844**
	(17.46)	(16.64)	(16.90)	(17.69)
PAST_FORSCORE		-0.0003 **	-0.00006	
		(-2.99)	(-0.61)	
COV_SCOPE			0.0018**	0.0018 **
			(8.70)	(9.63)
COV_AGE			-0.0023**	-0.0022*
			(-3.30)	(-3.53)
Adjusted R^2	0.4834	0.4268	0.4335	0.4897
SER	0.2160	0.2165	0.2153	0.2147
N. observations	8,157	7,463	7,463	8,157

Dependent variable: TPE_12M_AV

Independent variables	(1)	(2)	(3)	(4)
Intercept	-0.6042**	-0.5461**	-0.5774**	-0.6349**
	(-27.94)	(-23.61)	(-23.72)	(-28.19)
TP_MP	0.5682**	0.5316**	0.5295**	0.5662**
	(33.54)	(29.77)	(29.55)	(33.33)
MOMENTUM	0.079*	0.073*	0.073	0.080*
	(2.04)	(1.79)	(1.78)	(2.05)
EXTRA_REND_AV	0.8509*	0.8604**	0.8629**	0.8529**
	(32.50)	(31.01)	(31.19)	(32.73)
PAST_FORSCORE		-0.00018*	-0.00008	
		(-2.04)	(-0.85)	
COV_SCOPE			0.00078**	0.0009**
			(4.30)	(5.08)
COV_AGE			-0.00018	0.00019
			(-0.37)	(0.57)
Adjusted R^2	0.5842	0.5418	0.5428	0.5854
SER	0.2034	0.1998	0.1995	0.2031
N. observations	8,157	7,463	7,463	8,157

Table 9
Factors affecting the direction of the forecasting errors made by the equity analyst firms: the no-conflict hypothesis

This table presents the results of estimating the following OLS regression: $\text{TPERROR}_{i;j;t} = \alpha_0 + \alpha_1 \times \text{TP\_MP}_{i;j;t} + \alpha_2 \times \text{EXTRA\_REND}_{i;(t,t+365)} + \alpha 3 \times \text{MOMENTUM} +$

$+ \alpha_4 \times \text{PAST\_FORSC ORE}_{j;t} + \alpha_5 \times \text{COV\_SCOPE}_{j;t} + \alpha_6 \times \text{COV\_AGE}_{i;j;t} + \varepsilon_{i;j;t}$

where the variables are defined as follows: $TPERROR_{i;j;t}$: cardinal measure of the forecasting error (TPE_ANY in Panel A e TPE_12m in Panel B) made on the report published at time t, by the analyst firm j, on the stock i; $TP\_MP_{i;j;t}$: ratio of the target price (TP) to the official market price of the stock 2 working days prior to the issuance of the report (MP_{-2}); $EXTRA\_REND_{i;(t,t+365)}$: difference between the logarithmic return of the stock during the year following the report release and the logarithmic return of the S&PMIB stock index during the same period; MOMENTUM: logarithmic return of the stock i during the 6 months preceding the report release; $PAST\_FORSCORE_{J;t}$: lagged relative forecasting performance of the analyst firm j, referred to the quarter preceding the report issuance; $COV\_SCOPE_{J;t}$: total number of stocks covered by the analyst firm j during the year t; $COV\_AGE_{i;j;t}$: time (measured at time t, in quarters and fractions of quarter) since the beginning of coverage on the stock i, by the analyst firm j; $\varepsilon_{i;j;t}$: assumed normally distributed error term with zero mean and constant variance. T-statistics in brackets under the estimated coefficients. *: two-tailed probability < 0.05; **: two-tailed probability < 0.01. White heteroskedasticity-consistent standard errors and covariance.

Dependent variable: TPE_ANY

Independent variables	(1)	(2)	(3)	(4)
Intercept	-1.049 **	-1.07 **	-1.1099 **	-1.067 **
	(-107.59)	(-78.30)	(-70.18)	(-93.29)
TP_MP	0.8594 **	0.8615 **	0.8603 **	0.8591 **
	(119.22)	(90.73)	(90.38)	(119.24)
MOMENTUM	-0.2354**	-0.2385**	-0.2367 **	-0.2341 **
	(-5.34)	(-5.14)	(-5.12)	(-5.32)
EXTRA_REND	-0.7745***	-0.7734 **	-0.7782**	-0.7763**
	(-32.26)	(-30.62)	(-30.68)	(-32.21)
PAST_FORSCORE		-0.0005 **	-0.00061**	
		(-5.56)	(-6.49)	
COV_SCOPE			0,00078**	0.0004*
			(4.06)	(2.36)
COV_AGE			-0.0013	0.0013
			(-1.55)	(1.45)
Adjusted R^2	0.7067	0.6712	0.6721	07070
SER	0.2111	0.2153	0.2150	0.2110
N. observations	8,157	7,463	7,463	8,157

Dependent variable: TPE_12M

Independent variables	(1)	(2)	(3)	(4)
Intercept	-1.137**	-1.177**	-1.184**	-1.137**
	(-226.28)	(-183.14)	(-151.98)	(-187.92)
TP_MP	1.017**	1.03862**	1.0387**	1.018**
	(258.29)	(233.79)	(235.17)	(259.51)
MOMENTUM	-0.1080**	-0.1076**	-0.1071**	-0.1079**
	(-4.57)	(-4.32)	(-4.30)	(-4.56)
EXTRA_REND	-1.084**	-1.0838**	-1.0839**	-1.082**
	(-64.55)	(-61.10)	(-60.60)	(-63.99)
PAST_FORSCORE		0.00035**	0.00037**	
		(7.20)	(7.39)	
COV_SCOPE			0.0001	-0.00008
			(0.99)	(-0.88)
COV_AGE			0.00099*	0.001*
			(2.02)	(2.04)
Adjusted R^2	0.9303	0.9219	0.9220	0.9304
SER	0.1135	0.1161	0.1160	0.1135
N. observations	8,157	7,463	7,463	8,157

Table 10
Factors affecting the size of the forecasting errors made by the equity analyst firms: the conflict-of-interest hypothesis

This table presents the results of estimating the following OLS regression: $\left|\text{TPERROR}\right|_{i;j;t} = \alpha_0 + \alpha_1 \times \text{TP\_MP}_{i;j;t} + \alpha_2 \times \text{EXTRA\_REND\_VA}_{i;(t,t+365)} + \alpha 3 \times \text{MOMENTUM} + \alpha_4 \times \text{TRADING\_ACT} + \alpha_5 \times \text{IB\_ACT} + \alpha_6 \times \text{COV\_AGE} + \varepsilon_{i;j;t}$

where the variables are defined as follows: $\left|\text{TPERROR}\right|$, TP_MP, EXTRA_REND_VA, MOMENTUM: as defined in Table 8; TRADING_ACT: percentage of negotiations on behalf of third parts intermediated during the year preceding the report release, over the total amount negotiated by Assosim associates; IB_ACT: percentage of IPOs led or underwritten on the Italian stock market over the period 2003-2007; $\varepsilon_{i;j;t}$: assumed normally distributed error term with zero mean and constant variance. T-statistics in brackets under the estimated coefficients. *: two-tailed probability < 0.05; **: two-tailed probability < 0.01. White heteroskedasticity-consistent standard errors and covariance.
The regression has been run on three different databases: (a) the entire set of reports available for the Assosim associates; (b) a database obtained by eliminating the highest and lowest deciles of reports based on the TP_MP reports; (c) a database with reduced overlap, obtained by eliminating reports if another analysis has been published on the stock during the preceding 3 months by the same analyst with the same target price.

Dependent variable: TPE_ANY_AV

	Entire database		No extreme TP_MP		Reduced overlap	
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.5752**	0.2316	0.0316	0.1908**	-0.565**	0.024**
	(-27.71)	(32.21)	(1.01)	(25.81)	(-17.51)	(24.63)
TP_MP	0.5145**		-0.002		0.499**	
	(33.89)		(-0.071)		(20.26)	
MOMENTUM	0.2872**		0.3126**		0.266**	
	(5.72)		(5.54)		(4.01)	
EXTRA_REND_AV	0.6679**		0.7238**		0.751**	
	(16.03)		(15.19)		(13.47)	
TRADING_ACT	0.688	2.050**	0.944**	1.657**	0.5802	1.889**
	(4.90)	(9.79)	(6.68)	(8.83)	(3.03)	(6.60)
IB_ACT	0.155**	0.223**	0.136*	0.358**	0.089**	0.248**
	(2.94)	(3.31)	(2.45)	(5.31)	(1.25)	(2.72)
COV_AGE		-0.020**		-0.014**		-0.024**
		(-9.71)		(-7.50)		(-8.60)
Adjusted R^2	0.4826	0.020	0.3397	0.018	0.4792	0.0190
SER	0.2140	0.2946	0.1977	0.2411	0.2289	0.3141
N. observations	7,275	7,275	5,837	5,837	4,140	4,140

Dependent variable: TPE_12M_AV

	Entire database		No extreme TP_MP		Reduced overlap	
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.6106**	0.292**	-0.2267**	0.2285**	-0.6047**	0.2879**
	(-25.92)	(37.38)	(-8.87)	(37.13)	(-16.32)	(28.12)
TP_MP	0.5694**		0.2324**		0.551**	
	(31.33)		(11.11)		(18.84)	
MOMENTUM	0.077*		0.019		0.066	
	(1.88)		(0.54)		(1.25)	
EXTRA_REND_AV	0.848**		0.0857**		0.897**	
	(30.51)		(30.23)		(24.73)	
TRADING_ACT	0.2472*	1.579**	0.1521	0.7475**	0.099	1.391**
	(1.87)	(7.30)	(1.32)	(4.23)	(0.58)	(4.80)
IB_ACT	0.042	0.112	0.097*	0.267**	0.068	0.242*
	(0.92)	(1.58)	(2.40)	(-4.29)	(1.15)	(2.59)
COV_AGE		-0.016**		-0.006**		-0.021**
		(-7.01)		(-3.099)		(-7.48)
Adjusted R^2	0.5817	0.011	0.5222	0.005	0.6045	0.013
SER	0.2034	0.3129	0.1568	0.2263	0.2016	0.3185
N. observations	7,275	7,275	5,837	5,837	4,140	4,140

Table 11
Factors affecting the direction of the forecasting errors made by the equity analyst firms: the conflict-of-interest hypothesis

This table presents the results of estimating the following OLS regression: $\text{TPERROR}_{i;j;t} = \alpha_0 + \alpha_1 \times \text{TP\_MP}_{i;j;t} + \alpha_2 \times \text{EXTRA\_REND}_{i;(t,t+365)} + \alpha 3 \times \text{MOMENTUM} + \alpha_4 \times \text{TRADING\_ACT} + \alpha_5 \times \text{IB\_ACT} + \alpha_6 \times \text{COV\_AGE} + \varepsilon_{i;j;t}$

where the variables are defined as follows: TPERROR, TP_MP, EXTRA_REND, MOMENTUM: as defined in Table 9; TRADING_ACT, IB_ACT: as defined in Table 10; $\varepsilon_{i;j;t}$: assumed normally distributed error term with zero mean and constant variance. T-statistics in brackets under the estimated coefficients. *: two-tailed probability < 0.05; **: two-tailed probability < 0.01. White heteroskedasticity-consistent standard errors and covariance.
The regression has been run on three different databases, with the same criteria defined in Table 10.

Dependent variable: TPE_ANY

	Entire database		No extreme TP_MP		Reduced overlap	
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-1.018**	0.0028	-1.4478**	-0.074**	-1.041**	-0.025*
	(-92.58)	(0.30)	(-55.70)	(-8.81)	(-69.13)	(-2.03)
TP_MP	0.8543**		1.1752**		0.8699**	
	(113.41)		(57.10)		(82.01)	
MOMENTUM	-0.2358**		-0.2483**		-0.3954**	
	(-5.11)		(-4.72)		(-6.36)	
EXTRA_REND	-0.7658**		-0.8038**		-0.8198**	
	(-29.87)		(-29.33)		(-23.34)	
TRADING_ACT	-0.16	-0.6565*	-0.3534**	-1.878**	-0.2044	-0.6001
	(-1.17)	(-2.37)	(-2.68)	(-7.59)	(-1.12)	(-1.63)
IB_ACT	-0.4031**	-0.7076**	-0.2446**	-0.6785**	-0.4399**	-0.6139**
	(-7.87)	(-8.02)	(-4.98)	(-8.21)	(-6.23)	(-5.33)
COV_AGE		0.013**		0.029**		0.008*
		(4.90)		(12.26)		(2.44)
Adjusted R^2	0.7113	0.009	0.6704	0.0315	0.6948	0.0053
SER	0.2083	0.3858	0.1803	0.3090	0.2216	0.4001
N. observations	7,275	7,275	5,837	5,837	4,140	4,140

Dependent variable: TPE_12M

	Entire database		No extreme TP_MP		Reduced overlap	
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-1.127**	0.090**	-1.2260**	0.0055**	-1.125**	-0.06**
	(-198.13)	(8.35)	(-84.80)	(-6.00)	(-149.76)	(-4.30)
TP_MP	1.018**		1.1014**		1.014**	
	(243.43)		(96.17)		(180.46)	
MOMENTUM	-0.1169**		-0.1278**		-0.1816**	
	(-4.73)		(-4.11)		(-5.27)	
EXTRA_REND	-1.079**		-1.069**		-1.109**	
	(-59.73)		(-55.25)		(-45.59)	
TRADING_ACT	-0.247**	-1.015**	-0.3380**	-2.199**	-0.179	-0.6999
	(-3.34)	(-3.40)	(-4.16)	(-8.54)	(-1.81)	(-1.79)
IB_ACT	-0.1019**	-0.482**	-0.1119**	-0.5560**	-0.129**	-0.327*
	(-3.79)	(-4.76)	(-3.94)	(-5.91)	(-3.45)	(-2.50)
COV_AGE		0.013**		0.026**		0.006
		(4.50)		(10.21)		(1.67)
Adjusted R^2	0.9328	0.005	0.8950	0.0241	0.92268	0.0012
SER	0.1115	0.4289	0.1083	0.3308	0.1201	0.4313
N. observations	7,275	7,275	5,837	5,837	4,140	4,140

References

Agrawal A., Chen M.A., 2006. Analyst conflicts and research quality. American Law & Economics Association Annual Meeting, Paper 12, http://law.bepress.com/alea/16th/art12

Asquith P., Mikhail M.B., Au A.S., 2005. Information content of equity analyst reports. Journal of Financial Economics 75. 245-282.

Barber B., Lehavy R., McNichols M., Trueman B., 2001. Can investors profit from the prophets? Security analyst recommendations and stock return. The Journal of Finance 56, 531-563.

Barber B.M., Lehavy R., McNichols M., Trueman B., 2006. Buys, holds, and sells: the distribution of investment banks' stock ratings and the implications for the profitability of analysts' recommendations. Journal of Accounting and Economics 41, 87-117.

Barber B.M., Lehavy R., Trueman B., 2007. Comparing the stock recommendation performance of investment banks and independent research firms. Journal of Financial Economics 85, 490-517.

Belcredi M., Bozzi S., Rigamonti S., 2003. The impact of research reports on stock prices in Italy. Working paper, http://papers.ssrn.com

Bradshaw M.T., Brown L.D., 2006. Do sell-side analysts exhibit differential target price forecasting ability? Working paper, http://papers.ssrn.com

Brav A., Lehavy R., 2003. An empirical analysis of analysts' target prices: short-term informativeness and long term dynamics. The Journal of Finance 43, 1933-1967.

Bonini S. Zanetti L., Bianchini R., Salvi A., 2008a. Target price accuracy in equity research. Working paper, http://papers.ssrn.com

Bonini S. Zanetti L., Bianchini R., Salvi A., 2008b. Portfolio returns and target prices. Working paper, http://papers.ssrn.com

Cervellati E.M., Della Bina A.C.F., Giulianelli S., 2008. Earnings forecasting bias and accuracy in the Italian stock market (in Italian). Banca, Impresa e Società 1, 113-139.

Cervellati E.M., Della Bina A.C.F., Giulianelli S., 2005. Financial analysts; market reaction to recommendation changes. Working paper, http://papers.ssrn.com

Cervellati E.M., Della Bina A.C.F., 2005. Analysts recommendations and conflict of interest. Working paper, http://papers.ssrn.com

Cervellati E.M., Della Bina A.C.F, Patittoni P., 2007. Value of analyst recommendations: why international evidence finds an Italian anomaly that does not exist. Working paper, http://papers.ssrn.com

Chan L.K.C., Karceski J., Lakonishok J., 2003. Analysts' conflict of interest and biased earning forecasts. NBER Working Papers n. 9544, http://www.nber.org/papers/w9544.

Clement M.B., 1999. Analyst forecast accuracy: do ability, resources and portfolio complexity matter? Journal of Accounting and Economics 27, 285-303.

Cowen A., Groysberg B., Healy P., 2006. Which types of analyst firms are more optimistic? Journal of Accounting and Economics 41, 119-146.

Ertimur Y., Sunder J., Sunder S.V., 2007. Measure for measure: the relation between forecast accuracy and recommendation profitability of analysts. Journal of Accounting Research 45, 567-606.

Francis J., Soffer L., 1997. The relative informativeness of analysts' stock recommendations and earnings forecst revisions. Journal of Accounting Research 35, 193-211.

Hong H., Kubik J.D., 2003. Analysing the analysts: career concerns and biased earning forecasts. The Journal of Finance 43, 313-351.

Kadan O., Madureira L., Wang R., Zach T., 2008 *Conflicts of interest and stock recommendations: the effects of the global settlement and related regulations*. Working paper, http://papers.ssrn.com.

Ljungqvist A., Marston F., Starks L.T., Wei K.D, Yan H., 2007. Conflicts of interest in sell-side research and the moderating role of institutional investors. Journal of Financial Economics 85. 420-456.

Jackson A.R., 2005. Trade generation, reputation and sell-side analysts. The Journal of Finance 60, 673-717.

Jegadeesh N. Kim W., 2006. Value of analyst recommendations: international evidence. Journal of Financial Markets 9, 274-309.

Michaely R., Womack K., 1999. Conflicts of interest and the credibility of underwriter analyst recommendations. The Review of Financial Studies 12, 653-686.

Michaely R., Womack K, 2005. Market efficiency and biases in brokerage recommendations, in Thaler R.H. (editor), Advances in behavioural finance, vol II, Princeton University Press.

Mikhail M.B., Walther B., Willis R.H., 1997. Do security analysts improve their performance with experience? Journal of Accounting Research 35, 131-157.

Mikhail M.B., Walther B., Willis R.H., 1999. Does forecast accuracy matter to security analysts? The Accounting Review 74, 185-200.

Mikhail M.B., Walther B., Willis R.H., 2004. Do security analysts exhibit persistent differences in stock picking ability? Journal of Financial Economics 74, 67-91.

Sinha P., Brown L., Das S., 1997. A re-examination of financial analysts' differential earning forecast accuracy. Contemporary Accounting Research 14, 1-42.

Stickel S.E., 1992. Reputation and performance among security analysts. The Journal of Finance 47, 1811-1836.

Womack K.L., 1996. Do brokerage analysts' recommendations have investment value? The Journal of Finance 51, 137-167.