ANALYST RELUCTANCE IN CONVEYING NEGATIVE INFORMATION TO THE MARKET

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Abstract

This paper investigates one of the main sources of financial markets' public information: financial analysts' reports. We analyze reports on S&P 500 index through a multidisciplinary approach integrating behavioral finance with linguistic analysis to understand how financial phenomena reflect in or are deviated by language, i.e. whether financial and linguistic trends follow the same patterns, boosting each other, or diverge. In the latter, language could conceal financial events, mitigating analysts' feelings and misleading investors. Therefore, we attempt to identify behavioral biases (mainly represented by cognitive dissonances) present in analysts' reports. In doing so, we try to understand whether analysts try to hide the perception of negative price-sensitive events or not, eventually anticipating and controlling the market "mood". This study focuses on how analysts use linguistic strategies in order to minimize their risk of issuing wrong advice. Our preliminary results show reluctance to incorporate negative information in the reports. A slight asymmetry between the use of positive/negative keywords taken into account and the negative/positive trends of the index seems to emerge. In those weeks characterized by the index poor performances, the frequency of keywords with a negative meaning is lower. On the contrary, in the recovering weeks a higher use of keywords with a positive meaning does not clearly appear. A thorough investigation on the market moods and the analysis of the text of the reports enable us to assess if and to what extent analysts have been willing to mitigate pessimism or emphasize confidence. Furthermore, we contribute to the existing literature also proposing a possible analysts' value function based on the Prospect Theory [Kahneman and Tversky, 1979] where analysts try to maximize the value deriving from enhancing their reputation, taking into account the risks that may cause a reputational loss. This theoretical framework maintains our preliminary findings and supports the idea that analysts are risk-averse when facing reputational gains and risk-seeking in case of potential reputational losses.****

Keywords: Financial Markets, Public Information, Behavioral Finance, Analysts, Linguistic Strategies

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Introduction

The Efficient Market Hypothesis (EMH) suggests that market prices should incorporate all the available information about securities' cash flows prospects. This idea has represented an accepted cornerstone for most established asset allocation models in the past forty years. Such models also involve the assumption that individuals in the market act rationally.

As a consequence, the market should not react anomalously, if at all, to stale information, nor should well-known events be the origin of a generalized sudden crisis.

Recent events in the market have though demonstrated the frequent fallacy of such models. Particularly, they have failed in predicting single institution defaults as well as systematic turmoil, default contagions and global crises until too late to react.

Canvassing recent history, in the past twelve years we have assisted two global financial crises, in which market actors have systematically failed in correctly considering fundamental values and in properly diversifying their portfolios, due to risk underestimation and prediction capability overestimation. These events have led researchers and practitioners to develop highly sophisticate quantitative models to evaluate and predict security prices and market paths. Many researchers and practitioners claim that quantitative models, though very sophisticated, often suffer severe limits in dealing with irrational human behavior. In particular, forecast models suffer similar limits in dealing with global political and economic instability.

This paper investigates one of the main sources of financial markets' public information: financial analysts' reports. In particular, we analyze reports on S&P 500 index through a multidisciplinary approach integrating behavioral finance [Shefrin, 2002, 2006] with linguistic analysis. We analyze how financial phenomena reflect in or are deviated by language, i.e. whether financial and linguistic trends follow the same patterns, boosting each other, or diverge. In the latter, language could conceal financial events, mitigating analysts' feelings and misleading investors. Therefore, we attempt to identify behavioral biases (mainly represented by cognitive dissonances) present in the reports.

In analyzing these reports, we try to understand whether analysts have an early perception of the incumbent relevant events or not, i.e., if they have a better understanding of the market "mood". Subsequently, we compare the content and structure of the reports to the S&P 500 performance in different periods.

The study focuses on the presence of contradictions between the actual fluctuation of the index returns, on the one hand, and the evaluation of such trends by analysts and their possible message, on the other.

Our preliminary results show reluctance to incorporate negative information in the reports. A visible asymmetry between the use of positive/negative keywords taken into account and the negative/positive trends of the index emerges. In those weeks characterized by the index poor performances, the frequency of keywords with a negative meaning is lower. On the contrary, in the recovering weeks a higher use of keywords with a positive meaning does not clearly appear. A thorough investigation on the market moods, and the analysis of the text of the reports enable us to assess if and to what extent analysts have been willing to mitigate pessimism or emphasize confidence.

We assume that analysts develop doubts and concerns earlier than investors, who instead need longer time to incorporate them in security prices and express them in their reports. This is due to several reasons linked to the role analysts play in the financial market, to their bonds with institutions and to the effect of their reports on the dynamics developing in the market itself (i.e. information efficiency). Other reasons are more directly connected to individuals' cognitive distortions studied by behavioral finance, which not even established professionals are able to avoid.

1. Literature Review

The EMH [Fama, 1970] is based on the idea that prices in the market tend to incorporate all the available information about securities' cash flows prospects. This idea has represented an accepted cornerstone for most established asset allocation models in the past forty years, involving that individuals in the market act rationally [Markowitz, 1952, 1959].

Fama proposed three types of efficiency: (i) the strong form; (ii) the semi-strong form; and (iii) the weak form. In the weak form, prices can be predicted from a historical price trend thus profiting from it is impossible. The semi-strong form tests whether all public information, such as companies' announcements or annual earnings figures, is reflected in prices. Finally, the strong form concerns all information, including private information, and implies that no monopolistic information can entail profits. In other words, insider trading cannot earn a profit in the strong-form market efficiency world.

Thus, efficiency posits that the capital market is efficient when security prices fully reflect all known information and none of the investors can have monopoly control of it. In this sense, agreeing on a clear meaning of the expression "fully reflect", which is rather helpful in setting empirical tests on any efficient market proposition, becomes essential.

As Fama claims, on the basis of his own empirical tests, full market efficiency (i.e. the strong form) is not clearly and easily met [Ball and Brown, 1968; Fama, Fisher, Jensen and Roll, 1969;

Iederhoffer and Osborne, 1966; Scholes, 1969]. Nevertheless, the effect of information on price dynamics is an accepted point, at least in the semi-strong form. At the same time, rejecting the EMH implies the rejection of the market equilibrium model (e.g. the price setting mechanism).

Market efficiency denotes how information is factored in prices. The hypothesis of market efficiency must be tested in the context of expected returns: when a model yields a return which significantly differs from the actual return, one can never be certain as whether this is due to an imperfection in the model or to the market inefficiency. This concept, known as the "joint hypothesis problem" [Fama, 1970], has ever since vexed researchers. Thus, market efficiency *per se* is not testable but has to be tested jointly with an equilibrium asset-pricing model [Fama, 1991].

The only possibility left is then to modify the model by adding different factors in order to mitigate anomalies and to fully explain the return exploited by the model itself [Fama, 1992]. Therefore, the same anomalies work as signals. However, as long as they exist, neither the conclusion of a flaw model nor of market inefficiency can be drawn according to the joint hypothesis.

The EMH is widely recognized as an elegant theory that has held great attention among scholars and practitioners, leading to the idea that free markets are the most efficient means of allocating economic resources. If investors rapidly and rationally incorporate all available information into stock prices, then stock selection is a quite futile activity: no risk-adjusted returns exceeding the market ones can be earned from stock selection. Given this idea, several questions could arise on why institutions and investors put consistent amounts of money in market analyses and market information production.

If an active portfolio management strategy based on identifying "undervalued" stocks is basically unworthy, and if outperformance relative to a valid benchmark is a random outcome rather than the result of insightful investment decision making, then the distinction between luck and skill appears extremely vague and undetermined.

Still, financial information and available trading strategies cannot avoid biases and irrational behaviors among investors, as evidenced by the increase in the frequency and severity of bubbles and crashes in the markets. Irrational behaviors by individual and institutional investors have driven researchers to develop new theories on how people act in the market: an example is behavioral finance, which is often and wrongly seen as an anti-EMH theory. Human beings are definitely subject to errors and biases in their decision making. Moreover, the ability of more sophisticated, though not always more rational investors, to correct mispricing shows to be quite limited [Shleifer and Vishny, 1997].

At the same time, several researchers all over the world insist on declaring their loyalty to the EMH, considering the fact that behavioral finance has not yet proposed any market model likely to have the same elegance, strong theoretical framework and general applicability as the traditional ones. The bottom line seems to be represented by the fact that the evidence against market efficiency from the long-term return studies appears significantly fragile and anomalies become methodological illusions [Fama, 1998].[1] Thus, the debate on the theory of behavioral finance turns too often into a debate on Efficient Market *vs.* Inefficient Market Hypotheses. Such a debate, although very useful to help improve the theoretical understanding of market behavior, does not necessarily involve behavioral finance and sometimes leads to extreme positions and assumptions, which seem very much arguable on both sides. Market inefficiency is also considered by the EMH, although traditional models do not help much to predict the moment in which biases will appear, their intensity, or how long their effects on prices will last. This way, behavioral finance would appear as a simple observation of common and systematic errors, still remaining embedded in the traditional theory framework while, more rigorously, it should not. Much more appealing seems to be an image reported by Vernon Smith in his 2002 Nobel Prize Lecture, in which he does not oppose rationality to irrationality but, instead, uses constructivist and ecological rationality. That is to say that often, and virtually in every aspect of their lives, individuals must make decisions under uncertainty constraints, basically originated by the lack of time, by incomplete information and, of course, by the lack of skills.

Such decisions originate "*fast and frugal decision making.*" They are "*ecologically rational to the degree that they are adapted to the structure of an environment.*" [Smith, 2002, p. 502].

Moreover, even in the past, economists argued that the values to which people respond are not necessarily confined to those one would expect, based on the narrowly defined canons of rationality. Individuals define and pursue their own interest in their own way, which is an "ecological expected utility", to use Vernon Smith's figures, that leads to a new, smoother concept of "economic man" [Smith, 2002, p. 502].

Instead, traditional theory is meant to be:

the theory of rational behavior […] a study of the principles upon which a rational man would act. This rational man is unlike you and me in that he makes no errors in arithmetic or logic in attempting to achieve his clearly defined objectives. He is like you and me, on the other hand, in that he is neither

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[1] " ... an efficient market generates categories of events that individually suggest that prices over-react to information. But in an efficient market, apparent underreaction will be about as frequent as overreaction. If anomalies split randomly between underreaction and overreaction, they are consistent with market efficiency" [Fama, 1998, p. 284].

omnipotent nor omniscient. He must make decisions, such as the selection of a portfolio, in the face of uncertainty. Since his information is limited, he may take less than perfect actions. Since his power are limited, his achievement may fall short of the best conceivable. Every action however, is perfectly thought out; every risk is perfectly calculated. [Markowitz, 1959, p. 206].

However, field observation, as well as everyone's experience, shows a different picture. No one can consistently apply rational logical principles to everything he or she does. Cognitive effort costs often exceed benefits. Theorems rarely contain such errors. Nevertheless, bounded rationality imposes severe limitations on our capacity to develop economic theories much earlier than it does on our economic behavior.

Markets, as social institutions, are the result of conscious deductive processes of human reason. As such, they are intended to emerge from a deliberate creation of consciousness. This idea implies rationality as a basic tool of consciousness and correct information as a basic ingredient. Therefore, economic behavior is definitely a social behavior. Neuroscience defines social behavioral output as a *function of online processing of social stimuli* [Crick and Dodge, 1994]. This leads to the consequence that social behavior like investing in the capital market requires people to direct their attention to precise stimuli (*information on investment fundamentals*) coming from the specific environment considered (*the capital market and analyst reports*) and gives meaning to them. Only after mentally ordering those stimuli, can investors consider their personal utility function in terms of goals and expected returns. After calculating the outcomes associated with possible behavioral responses (*coherent with the social environment*), individuals decide on their personal response [Beer, 2007].

This is why emotions have very strong and predictable effects on cognition and decision processes. Emotional experiences engage sensible cognitive strategies that influence response selection [Levenson, 1999]. People with a positive sentiment are more likely to engage in automatic cognitive processes, react quickly, underestimate risk and focus on positive explanations when making decisions or judgments. On the other hand, when people are negatively biased, they are more likely to engage in effortful cognitive processes, react more slowly, overestimate risk, and focus on negative explanations when making decisions or judgments.

Interpreting the above statement in terms of the EMH requires agents to have proper information and the capacity to use it in the best way. Also, because of our brain physiology, such a talented mind would be totally incapable to stop the number of iterations needed to make a proper decision at an appropriate level [Damasio, 1994]. This may cause the temptation in scholars to ignore this reality because poorly understood, and because it does not yield to our familiar although inadequate modeling tools, and to proceed in the implicit belief that functions and curves capture the most essential elements of what we observe.

Deliberately creating action rules and being conscious of their effectiveness require to remain sensitive to the fact that most human decision making is not primarily guided, if at all, by conscious rationality. Our brain has developed over the past millennia arrangement capacities and survival properties that take into account opportunity costs and environmental challenges which are invisible – so far - to any possible modeling effort. In this respect, the most revealing example is the role played by trust in social behavior everywhere in the world, at different times and among all species socially organized. Trusting someone implies the existence of an interpersonal link aimed at achieving an improved state compared to the *status quo*. The possible outcomes of a choice strongly depend on the combined effects of other people's choices and behavior. Being impossible to adequately calculate all implications for each external stimulus, trust operates as a consistent simplifying factor [Arrow, 1974].

Following Vernon Smith,

We have become accustomed to the idea that a natural system like the human body or an ecosystem regulates itself. To explain the regulation, we look for feedback loops rather than a central planning and directing body. But somehow our intuitions about self-regulation do not carry over to the artificial systems of human society. The actual shape we observe is the consequence of myriads of individual decisions [Smith, 2002, p. 502, here referring to Herbert Simon].

What appears really important is not to confuse rationality with selfishness, since standard models usually promote or require selfish behavior. Still, as experimental economists have demonstrated, selfish behavior is not necessarily prevalent in common economic decisions, somehow contradicting standard models. But when other actors perceive an actor's selfish behavior as unfair, the latter may react, punishing such behavior, and such costly consequences should drive rational behavior toward a non-selfish attitude.

Behavioral finance focuses on errors of intuition. This means that cognitive biases are relevant for their intrinsic value as diagnostic indicators of mental mechanisms, in order to derive useful rules for interpreting and – eventually – predicting market trends.

We argue that traditional theory is a correct but largely incomplete theory and behavioral finance represents the best attempt to complete it, by observing and explaining rules people follow unconsciously. Rationality is then a qualitative parameter we can use to evaluate the adequacy of an individual decision, not very useful, though, to

evaluate social behavior such as those driving capital market dynamics. Moreover, the adequacy of a decision largely relies upon: the number of alternatives likely to be generated by individuals; expectations related to each alternative and associated probabilities; subjective preferences assigned to the values of possible results; rules used to make decisions.

Traditional models remain extremely robust on their normative power, though they usually suffer some kind of blindness to irrationality and actual risk propensity. Still, irrationality occurs and, quite often, not in terms of a random walk. Furthermore, most of the time arbitrage is not effective enough to bring order back. Mistakes are the essential source of potential value or, in other words, in the period of time between the emerging of a mistake in the market and the correction by arbitrageurs' activity, value can be created by *some* investors, at least. The possibility for economic models to embed all discussed elements faces relevant obstacles on subjective behavioral complexity, primarily because rational behavior and optimizing behavior are no longer perfect conceptual substitutes. External constraints can limit optimization, but not necessarily rationality.

In making decisions, individuals need to consider context variables adequately, also because they determine the social endorsement of a choice, which is more important to people than the evaluations carried out in terms of economic orthodoxy [March, 1994]. This idea would perhaps add a sort of collective rationality to decision making, since external constraints provide a strong contribution in terms of experience.

Rationality should then be valued not only in terms of efficacy (achievement of expected results) but also in terms of coherency with the environment. Individual cognitive biases and deviations from rationality are not necessarily endogenous errors. In helping the mind to work conveniently in a complex environment (i.e., the capital market), rationality does not necessarily manage uncertainty in order to discover the truth, but to produce sense [Luckmann and Berger, 1966; Popper, 1959; Simon, 1955]. The more an environment is complex, the more frequent biases will appear, although not necessarily more relevant for the social system as a whole. At the same time, the investors' mind dealing with market complexity assumes information as a guide to environmental coherency, which is useful in order to feel comfortable even in the stake of errors. Understanding the dynamics followed by professional information providers becomes crucial, as crucial is the possibility for such providers to give the market the shape they like, rather than to describe the shape it really has. The trading behavior of retail investors often demonstrates that they fail in understanding the

true message: analysts do not always mean what they write in their reports [Peixinho and Taffler, 2010].[2]

Reliance on analysts' expertise reduces the perception that investors have of uncertainty [e.g., Jiang, Lee, and Zhang, 2005; Zhang, 2006]. Moreover, literature gives evidence to the fact that analysts may play a much greater role in the bad news domain, since corporations' managers tend to withhold bad news [e.g., Hong, Lim and Stein, 2000; Kothari, Shu and Wysocki, 2010]. Rationales for trusting analyst reports are evident, since they are:

- Mostly highly educated professionals with an economic, business or financial background;
- Supposed to possess high standards in professional requirements as those demanded by the Chartered Financial Analyst Institute or similar organizations;
- Bound to comply with the Code of Ethics and Standards of Professional Conduct, which implies to act with integrity, competence, diligence, respect, and in an ethical manner with the public, clients, prospective clients, etc., but also to place the integrity of the investment profession and the interests of clients above their own personal interests, to promote the integrity of, and uphold the rules governing capital markets;
- Mostly analytical minded people with strong mathematical competences.

In short, analysts forge themselves to be the kind of person one would trust and in doing so they tend to act, think and write reports in a reliable manner. Such habits seem to have quite an influence in their use of language and the way they write. Hardly do analysts write something they don't think in a natural, straightforward and convincing way. If they have to, because of possible conflicts of interests, chances are that the way they express it will contain linguistic evidence of such biases.

Since the 1960s, linguists have been encouraged to study the language also from the institutional/professional point of view, highlighting the way in which language is used within the context where the linguistic phenomenon takes place and the participants to the phenomenon act. The investigation on linguistic varieties and registers was started by Halliday around that period.

Academic research on English for Specific Purposes (ESP) has been successfully carried out in Italy as well with the first publications in the 1980s. In addition to the traditional analysis of the morpho-syntactic and phrasal elements, these studies

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[2] Retail investors seem strongly misled in their decisions when analyst recommendations exert positive or no "pressure" on these non-sophisticated clientele (i.e., "strong buy", "buy" or "hold"). Such recommendations are likely to keep stock prices artificially high and lead investors to delay the incorporation of going-concern uncertainties into stock prices.

contributed to the introduction of the concept of genre, including issues related to social context linked to textual organization [Gotti, 1991, 2003, 2005; Cortellazzo, 1994; Dardano, 1994; Rossini Favretti, 1998; Cortese, 1996; Scarpa, 2001].

The study of language seen as an exchange of meanings and representations in interpersonal contexts and as part of a communicative social system, started by Halliday and Moody in the 1970s, has been carried on by Swales and Bhatia since the 1980s. Their research on ESP has focused on the particular discursive features of each genre taking into account the author and the social context aim, as well as the reasons for the lexical and grammatical choices.

Sinclair's (1991, 1996, 1998, 2004) research matrix on ESP is based on the assumption that contextual association between words can define a sequence of important syntagmatic relationships from which a varied number of abstractions can be inferred. The lexical elements unveiled increase the gap between semantics and pragmatics and have contributed to the study of textual cohesion and of the speaker's point of view (Stubbs 2002; Tognini-Bonelli 2001).

This approach, together with S. Hunston and G. Francis's research on model grammar (2000), becomes essential to investigate analyst reports between textual/linguistic and interpersonal contexts. Combining Sinclair's theories (2004), corpus analysis is a useful methodology both for pragmatics and for discourse and ESP analysis. Pragmatics is intrinsic to ESP and this relationship needs to be better explained and theorized (Triki 2002).

The debate on the potential conflicts of interest of financial analysts affiliated to investment banks is still lively. Former studies in literature [e.g., Michaely and Womack, 1999] showed the tendency of sell-side research analysts to issue overly optimistic recommendations to get business for their investment banks employers, favoring covered firms. The conflict of interest was mainly caused by analysts' compensation schemes, partly based on their ability to attract business for their employers [Bradley, Jordan, and Ritter, 2008; Bradshaw, Richardson and Sloan, 2003; Dechow, Hutton and Sloan, 2000; Dugar and Nathan, 1995; Lin and McNichols, 1998; Lin, McNichols and O'Brien, 2003]. Of course, another important part of the analysts' compensation depends on their reputation, often based on the accuracy and timeliness of the recommendations, and listed in recognized rankings [Hong and Kubik, 2003].

Another possible explanation of analysts' over-optimism refers to the fact that they can be worried of jeopardizing the good relationship with the management of the covered firm, an important source of data and information for their work. Also, hyper-optimism could be due to behavioral reasons, like the "selection bias": analysts may start covering a

company because they like it, i.e., they are overly optimistic on it [McNichols and O'Brien, 1997].[3] However, more recent studies have revived the debate, showing that the recommendations of affiliated analysts are not always over-optimistic.

The relation between optimistic reports and past [Clarke et al., 2006] or future [Clarke et al., 2007; Fleuriet and Yan, 2006; Ljungqvist, Marston, and Wilhelm, 2006] investment banking mandates is thus not clear-cut.

Market participants devote high attention to analyst reports. The higher the number of analysts covering a company, the greater the market reaction in case of recommendation revision. The market seems to be more interested in the stocks that are more covered by analysts [Bradley, Bradford and Ritter, 2003]. For this reason, it is important to understand if conflicts of interest may impact on the investment value of analyst recommendations. While former evidence [Michaely and Womack, 1999] showed lower market returns around the announcement of recommendations issued by affiliated analysts, recent studies have found that recommendations provided by non-independent analysts do not underperform those issued by independent analysts, raising doubts on the true effects of these potential conflicts of interest [Bradley, Jordan, and Ritter, 2008; Clarke et al., 2006; Groysberg et al., 2005].

In particular, the market reaction to the recommendations issued by affiliated analysts does not significantly differ from the one following reports issued by independent analysts, when the recommendation characteristics and timing are taken into account [Bradley et al., 2008].

Not only the short run market reaction, but also the long run performance of the stocks recommended by affiliated or independent analysts have been analyzed. While former studies [Michaely and Womack, 1999] showed that buy recommendations issued by affiliated analysts underperformed those issued by their independent peers, recent papers do not support this evidence [Clarke et al., 2006; Groysberg et al., 2005].

Another stream of research investigates the relationship between affiliated analysts and their employers' trades. For example, analyst earnings forecasts seem to be more accurate when the asset management branch of the same bank they work for holds more stocks of the company they cover [Irvine, Simko, and Nathan, 2004]. In addition,, analysts' recommendations tend to be more optimistic if the stock of the covered company is hold by mutual funds affiliated to the same bank [Mola and Guidolin, 2009]. Furthermore, merger and acquisition bank advisors buy (sell) the acquirers that their affiliated analysts upgrade (downgrade) [Haushalter and

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[3] Analysts' over-optimism not only affects their recommendations, but also the estimates of future earnings [Rajan and Servaes, 1997].

Lowry, 2009]. A very recent and interesting paper [Jordan, Liu and Wu, 2011] has studied how institutional investors deal with recommendations issued by their affiliated analysts, showing that sell-side research is indeed used by their employers. This evidence is important in at least two respects: it shows that institutional investors believe that sell-side research is valuable, and it suggests that potential conflicts of interest may be not so important, given the fact that the investment banks themselves follow their affiliated analysts' recommendations.

2. Data and Linguistic analysis

2.1 Data Analysis

To carry out the present study, we analyze reports issued by Goldman Sachs Research in the period November 2009 – November 2011. In particular, we consider two types of reports: S&P 500 Beige Books, and US Weekly Kick starts.

S&P 500 Beige Books contain a backward view of every past three months, and they are inspired by FED Beige Books but, unlike them, which rely on a variety of sources, Goldman's version emphasizes a series of statements made by senior executives during earnings conference calls on market relevant issues, concerning corporations listed in the S&P 500.

US Weekly Kick starts are much shorter and synthetic reports, issued each Friday and they aim at providing tips for the following trading week.

The choice of these two types of reports was mainly driven by:

- Wide range of information provided and documents' availability, which also affect the length of the time series;

- Content and style homogeneity;
- Focus on S&P 500;
- Methodology based on classes of corporations and fundamentals;
- Possibility to catch directions in market cycles in both types of reports working with different keywords and Type Token Ratios (henceforth TTR) (*Tokens* are the words in a text considered once. *Types* refer to the total number of words, repeated as many times as they appear. The ratio between types and tokens (TTR) may widely vary also in accordance with the length of the text under observation. Such type/token relationship is informative, and gives a measure of the textual lexical density and variety.).

2.1.1 Beige Books

Having a coverage range of few months, Beige Book (henceforth BB) reports allow to have a wider view than the one offered by Weekly Kick Starts (henceforth KS), particularly on the S&P 500 dynamics.

By jointly considering the two types of reports, it is possible to observe that the longer and less frequent reports assess the direction toward which the market tends to move, evidencing rationales underlying such trends at corporate and class/industry level. The more frequent ones tend to confirm directions, basing judgments and valuations on fundamentals' performances emerging in the US financial market, highlighting emerging issues week by week.

Table 1. BB statistics

Text file BB	Overall
File size	1,237,469
Tokens (running words) in text	207,073
Tokens used for word list	200,589
Types (distinct words)	7,075
Type/Token Ratio (TTR)	3.53
Standardized TTR	40.16
Standardized TTR std.dev.	59.45
Standardized TTR basis	1

Table 1 gives us an idea of the BB subcorpus quantitative features. The BB subcorpus is made up of about 207,000 running words (the total number of words), of which about 7,000 are distinct words (i.e., as if considered only once). The ratio between these numbers, the TTR, tells us how dense and variable the language used in these documents is. The standardized TTR, calculated every 1,000 words, is

definitely high. The language is therefore rich of expressions mainly identifying market trends, informative and evaluative expressions and, less frequently, predictive ones.

The documents are on average 50 pages long and contain a number of running words comprised between 19,600 and 30,600. Tables included in the

reports help make the data easily identifiable and readable.

The objective of these documents is overtly stated in the section *Key Takeaways from S&P500*, in a comparison with *The Summary of Commentary on Economic Conditions* (known as the Federal Reserve BB, p.3 of each document):

The Summary of Commentary on Economic Conditions, commonly known as the Beige Book, is published by the Federal Reserve eight times per year. In it, the 12 regional Reserve branches offer anecdotal evidence on the current economic environment in their respective regions based on interviews with key business contacts, economists, market experts, and other sources. In our quarterly Beige Book publication, we review the earnings transcripts of companies in the S&P 500 to monitor the anecdotal evidence of pricing, volume, costs and thematic trends. This quarter's report contains excerpts from 32 companies that account for 14% of total S&P 500 revenues and comprise 20% of the S&P 500 equity capitalization. All management comments on the following pages were taken verbatim from the company transcripts as recorded by Call Street and accessed via FactSet. All company data is as of February 3, 2010. This quarter, we highlight (…).

These few lines unveil the documents' frequency of issue, which is quarterly, their purpose to screen subjective data of fundamental and thematic trends. The number of companies and the percentage they represent in terms of revenue in the market and of equity capitalization is disclosed.

The source is better specified with reference to management comments and to the recording and transcription technologies, as well as to the issue date. Then, the list of the main themes (4-6 on average) follows to suggest the main content. Afterwards, they are developed one by one. A table on the companies mentioned in the report is placed right after the table of contents, previous to the key takeaways, highlighting their relevance.

Once the themes are introduced, they are further developed reporting the companies' management points of view. Then, Consumer Discretionary are observed, with the use of + and/or – symbols, which straightforwardly give an idea of the sector positive and negative trends, in terms of revenues, demand, risks, economic recovery, international growth, commodity inflation and capex. Consumer Staples follow with a more relevant presence of Business outlook. Energy, Financials, Health Care, Industrials, Information Technology, Materials, Telecom Services and Utilities are the other sectors taken into considerations. Disclosures close the reports.

Unlike the KKs, as further highlighted below, the BBs are mainly informative, reporting facts, and evaluative on the part of the management. Predictive sections are less frequent suggesting a lower involvement by the analyst.

2.1.2   Kick start

Table 2. KK statistics

Text file KS	Overall
File size	604,366
Tokens (running words) in text	98,944
Tokens used for word list	87,319
Types (distinct words)	4,708
Type/Token Ratio (TTR)	5.39
Standardised TTR	35.57
Standardised TTR std.dev.	61.85
Standardised TTR basis	1

Table 2 underlines the KS subcorpus quantitative features. The KS subcorpus is made up of about 98,944 running words, a lower number than the BB subcorpus, even if the amount of shorter documents is higher. Distinctive words are 87,319 with a standardized TTR slightly higher than that of BB, meaning a more dense and varied language. The language is rich of expressions identifying market trends, informative, evaluative and predictive stances.

Their textual organization is characterized by an average length of 20 pages, including a 1/2-page full-text section (a total of 99,000 words) and numerous graphs and tables. A first observation has highlighted the textual structure and the lexical variety and density of the reports, characterized by the expression Kick Start and their objective to be a starting point for the following days.

Therefore, the main functions exploited by the documents are informative, evaluative and predictive: "Your five-minute guide to the US equity market: performance, earnings, valuation, & more" (Kick Start November 16, 2009).

They are released on Friday and provide background knowledge on the previous week, assess

the events and forecast future measures and actions. The linguistic strategies associated with this textual genre are geared towards reporting facts and assessing them, predicting future actions in a way that seeks to make the data and measures easier to understand for the ordinary readership.

Textual and non-textual features, which enhance the communicative function of the text, are clear, intelligible and unambiguous, taking into account the different target readers. However, when tables and charts are poorly commented, the ordinary reader may find difficulties in understanding the data and, therefore, the message conveyed.

The identification of the most recurring lexical items used by analysts to communicate with expert and non-expert readers is critical as they contribute to build a relationship based on trust, loyalty, prudence, care, adequacy and confidentiality.

Investment analyses and recommendations must rely upon sound, fair and accurate elements. While writing their reports, analysts must follow a code of ethics and professional conduct standards, aiming at improving their relationship with market participants and, in particular, investors.

The first page information highlights the coherence vis-à-vis the evaluation and advice provided, as well as possible conflicts of interest. Most documents consist of the report *tout court* in the first one or two pages, followed by revision, valuation, performance assessment, recommendations, forecasts and strategies in the form of charts and graphs, let alone the analyst certification and some legal disclosures. As these documents are mainly presented in the form of tables, they leave the ordinary reader with the task to decode the data given according to her personal, and possibly professional, competence and skills.

2.2 Linguistic Analysis

2.2.1 Modals

Following Donohue [2006], the credibility of narrative forecasts depends on the choice of linguistic conventions that characterize a specific genre.

A typical linguistic feature of these reports is the use of a wide range of modal verbs. They are even considered as hedging devices, i.e., they better exemplify the analyst's degree of certainty in forecasting future events, and, therefore, enhance her credibility.

In analyzing the use of modality, both in BBs and in KSs *will* is the most frequent one, followed by *can* (BBs) and *may* (KSs). The use of *will* gives evidence of certainty in the author/management point of view. *Will*, as well as *may* and *can*, is an epistemic modal, i.e., it expresses the degree of commitment by the speaker to what she states, involving her belief, knowledge, etc., with reference to the claim [Palmer, 1986, Facchinetti, 1992]. This means that in KSs

analysts express confidence in what they are communicating towards future outlooks. Instead, in BBs, the frequent use of *will* denotes management's documented attitude to overconfidence [Shefrin, 2006]. *May* normally shows greater formality and lower probability which supports KS analysts' approach to the way they want to convey their opinions and recommendations, keeping a certain distance from them, and being cautious. As a matter of fact, in BBs, which report the management's point of view, *can* is more frequent, as analysts are even less involved in the information provided. *Should*, the third most frequent modal in both *subcorpora*, is normally used to give advice, denoting a higher involvement of analysts' reputation, and is higher in KSs as they are more predictive and evaluative than BBs. *Should* implies some ambiguity, uncertainty and personal judgment and may sound as a suggestion of how to behave in certain circumstances. *Shall*, which is very common in legal documents, as it represents an order, a direction, is absent from all documents, supporting the idea of giving general opinions. We do not even find it in the legal disclosures present in the last part of the documents.

Considering the overall frequency of all modals present in the documents, we can observe that the same patterns are employed and the first seven modals are exactly identical and in the same order in both BBs and KSs. The only exception is represented by *may* and *can* which are inverted, due to a higher degree of overconfidence of managers compared to analysts. However, the opinion expressed seems to be shared by analysts in both BBs and KSs.

Not only verbs, but also adjectives (e.g., *probable*, *possible*), adverbs (e.g., *probably*, *certainly*), nouns (e.g., *thought*, *recommendation*), and lexical verbs (e.g., *advise*, *recommend*, *believe*) concur to build modality, which is semantically identified. It gives us an idea of what is possible, necessary, probable, etc. The whole sentence is to be considered to reach the whole and real meaning expressed by the analyst.

2.2.2 The Text Protagonists

The reports we have investigated are economic-financial analyses, written basically by the same team of analysts working for Goldman Sachs, and addressing investors and market experts. KSs protagonists are analysts and clients. In the General Disclosures section this is clearly stated "This research is for our clients only". This statement also limits analysts' liability. BBs also involve analysts and clients, and, in particular, the covered companies.

In KSs, the analyst's point of view is predominantly underlined by the use of the pronoun *we*: e.g., "*We highlight*", "*We continue to believe*", "*we advise clients*", "*we are more cautious*", etc. The purpose to help their clients understand their message is also evident. As a matter of fact, we find sections

giving a definition of certain expressions: "There are 'known knowns'. These are things we know that we know." (February 5, 2012 KS). In the disclosures, a definition of what is intended for *Buy*, *Neutral*, *Sell*, *Return Potential* and other expressions is given (e.g. February 12, 2010 KS). Other sections are headlined "Conversations we are having with clients (…)", often in the form of Questions and Answers to make the addressee feel taken care of. In February 19, 2010 KS, we even find "Conversations we are having with clients: our questions and their answers", as to give authority to the client's opinion.

In BBs, the predominant opinion is that of the management and analysts report their point of view: e.g., "Management teams highlighted", "Many globally-exposed firms commented", "Many companies noted", etc. Management teams, managements, managers, companies, US firms and customers are thoroughly mentioned with reference to their views and behaviors.

In investigating the occurrence of pronouns, we observe a prevalence of the pronoun *we* in both KSs and BBs. This means a high involvement by the author in the discourse. However, while in BBs *we* refers to the management's point of view, in KSs it refers to the analyst's perception. Moreover, it represents the analyst team opinion, which is shared among the team, keeping in mind that the same analysts write both types of documents. *We* also reduces the distance between the writer and the reader, giving strength to what is uttered.

An element which is completely different in BBs and KSs is the use of the pronoun *I*, that we typically find repeated in the first type of reports, while the number of occurrences in the second one is definitely limited. This can be explained by the different participants in these documents: as BBs report the management's opinion, the pattern "*I think*" is very frequent, also suggesting personal opinion and management's attitude in highlighting their frontline role.

The high frequency of *you* in BB is an element of the colloquialism characterizing conference calls frequently reported in the documents, also assessing the kind of personal relationship between analysts and managers of the corporations listed in the S&P500. This leads directly to the issue of the effort analysts put in cultivating personal relationships with the managers of the corporations they cover and the conflicts of interest that may arise, as abovementioned. *You* builds a dialogue between the writer/speaker and the reader, asking the reader to respond, to carry out a certain action. This seems to unveil a sort of double dialogue: one between the

manager and the analyst and one between the analyst and the reader. However, the analyst role does not entail filtering the manager's opinion apart from her choice of the extracts to include in the report.

Of course, on the one hand, the manager has chosen to communicate certain information, and, on the other, the analyst further selects and chooses among that information. Therefore, analysts are able to emphasize or smooth the strength of the information conveyed.

The use of the possessive adjective *your*, instead, seems to be analysts' peculiarity, showing their tendency to reduce their responsibility towards how information is conveyed to generate market expectations. The pronoun *they*, which is frequent in BBs, is normally employed by analysts to report both investors' and managers' behavior, keeping a certain distance from them.

A both quantitative and qualitative comparison of the two subcorpora (KSs and BBs) highlights an evident diversity in the language variety. As abovementioned, while the number of tokens of KSs, which include a higher number of documents, is 98,944, the number of tokens in BBs is 207,073. The TTR shows a greater language variance in KKs than in BBs. This means that BBs are longer documents devoting more importance to words and descriptions while KKs rely more upon graphs and tables, in general on intertextuality (Bhatia 2004). Therefore, while KSs seem less loaded and therefore easily readable, BBs are longer and appear more complex to decode. However, the use of tables and graphs accompanied by short texts, characterized by language variety, leaves the reader with the responsibility to build her own judgment. This is also supported by the qualitative analysis which identifies the textual informative, evaluative and predictive functions present in KSs while BBs are mainly informative and rarely evaluative and predictive on the part of the analysts. Of course, in the managements' words we find predictions and evaluations. This difference originates from the fact that BBs refer to the previous three months while KSs refer to a much shorter time span, with a perspective on the following week.

The different language variety is also due to the effort put by analysts in addressing the market with their view of the future. This results in a higher reputational risk taken by analysts.

Table 3 shows the frequency of expressions underlining analysts and managers personal involvement in the message. While in KSs it is the analyst's point of view that emerges, in BBs these items are normally employed by managers.

Table 3. Personal involvement statistics

Expressions	KS	%	BB	%
anticipate*	21	0.0212%	120	0.0580%
believ*	74	0.0748%	228	0.1101%
expect*	416	0.4204%	773	0.3733%
favor*	17	0.0172%	62	0.0299%
feel*	0	0.0000%	111	0.0536%
forecast*	531	0.5367%	111	0.0536%
guess*		0.0000%	20	0.0097%
highlight*	39	0.0394%	47	0.0227%
outlook*	112	0.1132%	418	0.2019%
overlook*	2	0.0020%	2	0.0010%
point*	64	0.0647%	338	0.1632%
recommend*	320	0.3234%	2	0.0010%
suggest*	24	0.0243%	23	0.0111%
think*	4	0.0040%	832	0.4018%
view*	242	0.2446%	99	0.0478%
Total	1866	1.8859%	3186	1.5386%

Data show that analysts cautiously use words belonging to the semantic field of forecasts denoting their tendency to convey the message through indirect linguistic strategies aiming at reducing their reputational risk. They avoid taking precise positions on future predictions unless strictly necessary. At the same time, in BBs these expressions are typical of managers in the extracts reported. The lower use by analysts is evidence of their choice to mitigate managers' overconfidence. For example, *think* is four times more frequent in BBs than in KSs and *feel* and *guess* are present in BBs but not in KSs. Another instance is that of *point*, which tries to catch the reader's attention on specific issues. Instead, items such as *recommend*, *forecast* and *view* are definitely higher in KSs, underlining these documents' purpose to convey analysts' predictions.

2.2 .3 The credibility issue

The relationship between the way messages are conveyed and the data offered to support them is crucial in terms of the credibility built, especially when forecasts are involved [Hursti, 2011]. An element to consider is the market reaction both in the short and in the long term, as sometimes corrections intervene. A greater number of expressions identifying future events and the preciseness of the forecast normally result in a greater response by the market [Miller, 2009]. The linguistic strategies employed influence investors' decisions as they complement those tables that could otherwise be difficult to quantify. Clusters of negative words could be positively associated with low future earnings and companies' share price losses.

As above mentioned, credibility is enhanced by the use of modal verbs and of modal qualifiers such as "presumably" "likely", "modestly". The presence of modals showing uncertainty (*may*, *could*, *should*), especially if accompanied by adverbs, should function as a red flag to a rational and sensible investor.

Disclosures also play an important role in building credibility.

Forecast credibility also depends on analysts' own features, on the one hand, and on clients' expertise and mood on the other.

3. Behavioral Insights

Theories on behavioral finance were originally proposed to explain how financial markets work and individual investors behave more realistically than classical ones. Prices are originated by very complex dynamics and by "anomalies" which can be explained only by understanding bounded rationality mechanisms and cognitive biases, both at individual and groups' level. While trying to understand such elements, the way information is produced and conveyed to the market deserves particular attention. Individual investors need a minimum set of skills and expertise. We often refer to these abilities as *talent* or *intuition*, i.e., the capacity to catch foggy signals and connect them to subjective expectations, but also to understand other investors' sentiment.

The information available in the market, although not complete, tends to be homogeneous and

considered widely reliable by investors. Therefore, analysts have a strategic role in constructing a frame, which is supposed to represent reality. As a matter of fact, investors, in a sort of agency relationship with analysts, very rarely carry out fundamental analyses on their own.

Thus, in a weak form of market efficiency, prices are mostly influenced by the information published. At the same time, the latter is influenced by recent past market trends, activating a loop reaction, which excludes long run predictions and fundamental analyses.

This denotes a rather active role played by analysts in the market. Not only do they convey information to the market, but they also produce it and select it, being very much aware of their function, power and responsibility.

It is, therefore, evident that they will try to maximize their utility, just as any other market actor will do. That is to say that they will tend to maximize their reputation as main source of value and minimize the risks deriving from their work. Reputation depends largely on how successful they are in interpreting market dynamics, since the value of the information conveyed depends on how successful their clients will be when investing as suggested. As a consequence, they try to maximize forecast accuracy or, in other words, to minimize forecast errors. Risk is represented by the probability of errors. However, another source of risk is given by the single analyst decision on whether and to what extent to deviate from other analysts' forecasts, or from the so-called *consensus*, typically the mean or median forecast. Deviating from *consensus* is risky for an analyst since in the case her forecast is less accurate, she would experience a reputational loss. Instead, if she aligns with *consensus*, and this proves not to be accurate, she can always share the blame with other analysts, and thus not be penalized in terms of reputation.

Analysts' value function represents the basic motivational mechanism driving their decision-making and behavior. We use the term "value" instead of "utility" function to underline that we believe that analysts follow the prospect theory [Kahneman and Tversky, 1979], as proposed in behavioral finance literature, instead of the traditional utility function [von Neumann and Morgenstern, 1947]. Since the latter is based on a measure of total wealth, we believe that this gives a far too vague idea of the term *utility* that is not necessarily coherent with the dynamics involved in financial markets.

Analysts, although strongly shaped by their education, career, professional standards and mentality, are exposed to cognitive biases just like any other market actor. Therefore, they display the same type of risk propensity described in prospect theory: risk averse in the domain of gains and risk takers in the domain of losses. We claim that analysts value potential gains and losses with respect to a reference point represented by their individual reputation when issuing the report, i.e., their *status quo*.

To understand why this occurs, we have to evaluate the above-mentioned sources of risk, and link them to market movements: the risk associated with a reputational loss in case of forecast inaccuracy.

Behavioral finance states that individual reactions to bad news are usually higher than the one following good news. In this respect, it seems that inaccuracy could be perceived more when markets go down. In other words, it would be better for investors to anticipate future crisis, instead of future booms. The risk associated with inaccuracy in case of downturns thus seems larger compared to the lack of accuracy in bull markets.

While analysts' utility functions have been proposed in previous studies [Lim, 2001], as far as we know, there is no theoretical model of analysts' value function, based on prospect theory, available yet.

In settling on the measure of subjectively perceived risks by analysts, which has to be based on their use of language, we also need to determine a reference point, which in our view can be represented by the average of differences between positive and negative keywords (see Table 6 below). Such figures signal and orientate, consciously or not, the overall mood in the market. Therefore, the more analysts force their language to diverge from the reference point, the more they will feel exposed to reputational risk. Although we do not have the complete empirical evidence yet, since the present research should be considered as a work in progress, our preliminary results suggest that when the value of the index rises, analysts tend to reduce the use of positive keywords, since they feel that the market itself pushes investors' activity and they do not need to take any particular risk in suggesting a stronger involvement. When the index tend to decrease, analysts start to increase the use of keywords, gradually deviating from the reference point in order to mitigate the negative effect of market dynamics in investors' sentiment, but in doing so, they take an increasing risk share of misleading investors decisions and drawing unrealistic pictures of market prospects, accepting a significant reputational risk.

The shape of analysts' value function is then impressively similar to the one of the generic value function proposed by Kahneman and Tversky (1979). We display a possible analysts' value function in figure 1.

Figure 1. Analysts' Value Function
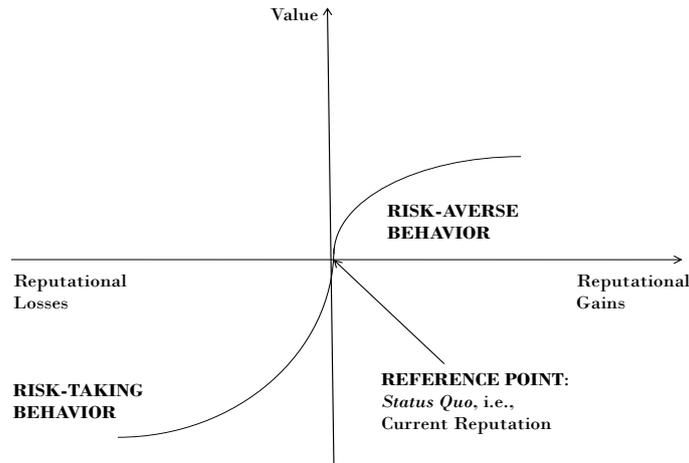
In settling on the measure of subjective risk, we state that they use the language as a tool which allows them to balance two opposite needs: they have to truthfully issue their best forecasts, on the one hand, and they may be willing to influence market dynamics, on the other hand, as a consequence of possible conflicts of interest and/or other biases originated by their affiliation. In this sense, the measure of the risk analysts perceive can be calculated using linguistic parameters extracted from their reports. From a behavioral point of view, the texts examined show at first sight several biases, among which analysts' overconfidence about their ability to interpret fundamentals' figures and to assess their credibility. In doing so, they rely on a wide range of data, on numerical analyses and on sources carefully conveyed through sound linguistic strategies. They use a great variety of terms, in order to increase the number of issues covered in their reports, paying a great deal of attention in avoiding to take a clear personal position, unless strictly necessary. In other words, whenever possible, analysts present market facts in order to give their clients an information frame within which they can draw their own opinion and make decisions.

In order to understand how financial phenomena reflect in or are deviated by language and whether financial and linguistic trends follow the same patterns or not, we studied the index performance in the analyzed period. We picked the value of S&P 500 as the closing price on the first trading day following the issuance of the report.

Since KKs are issued on Friday, apart from some postponed ones due to festivities, we took the closing price of the S&P 500 on the Monday following the report issuance (Whenever Monday happened to be a non working day, we would pick the first following working day). With regard to the index's performance, we isolated different time spans in which the market followed a defined trend. We consider a trend to be positive when the index return performs higher than 4% for a continuous and stable time span, and negative when the performance is below - 4%. The choice of 4% corresponds to a value the trader starts to consider interesting as emerged from our analysis.

We call "lateral" the market in which no clear trend can be observed. Following this methodology, we identified four positive and four negative periods, as shown in Table 4.

Table 4. Market cycles' returns, directions and lengths in weeks

S&P500		Length in weeks
Returns	**Direction**	
- 6.88 %	Down	4
14.17 %	Up	11
- 12.52 %	Down	6
15.15 %	Up	11
8. 73 %	Up	7
- 6.79 %	Down	6
- 16.39 %	Down	6
13.58 %	Up	4

It is now possible to jointly study the use of language and the index performance aiming to find whether and, eventually, to what extent, language may conceal financial events, mitigating analysts' feelings and misleading investors.

Following the linguistic analysis, we selected in the reports a number of keywords, namely four in Kick Starts, and four in Beige Books. Using Wordsmith Tools 5.0, we isolated words' clusters in order to examine the linguistic context in which analysts use keywords. In this way, we had the possibility to discern if the selected keywords are used in a positive or negative sense. We then calculated the difference between the number of keywords used with a positive meaning and the amount of keywords used in a negative sense, in order to have a perception of the prevalence of positive over negative usage of the keywords.

In what follows, we present the preliminary results we came across analyzing Kick Starts reports (Since the results for the Beiges Books reports are similar, we do not report them here for space constraints). The keywords selected in KSs reports are: Grow* [the asterisk signifies that we considered every word including the root "grow", e.g., grows, growing, grown, growth, grew]; Earn* – EPS; Profit*; Perform*.

These keywords have been chosen for being representative of analysts' mood, among the most frequent in the reports. In Table 5, we present the number of keywords included in two KK reports as an example, as well as the value of the index's return in the first day following the report issuing day.

Table 5. S&P 500 returns and number of keywords in reports

Date	S&P500 return	Grow* (pos)	Grow* (neg)	Diff. pos-neg
May 3, 2010	- 6.39%	11	3	**8**
Nov 1, 2010	+3.60%	6	3	**3**

In each period, we determined the difference between the positive and negative use of keywords in all the reports, and calculated the average for the period. Table 6 shows the average of differences between the positive and negative keywords' use in the 90 Kick Starts reports.

Table 4. Average of differences between the positive and negative keywords' use over 90 Kick Starts reports

Grow*	Earn – EPS	Profit	Performance
2.87	4.90	1.04	1.76

On average, among the 90 KS reports considered, we find that the positive use of keywords prevails. This very simple evidence confirms the idea that analysts tend to be quite optimistic. As a matter of fact, the negative use of keywords prevails on the positive one only in few cases, mainly during those periods in which we do not find a clear trend in the market (lateral), which we did not find relevant within the analysis.

Using the frame of prospect theory, the data in Table 6 represent analysts' reference point in their value function. In other and more simple words, we claim that analysts, consciously or not, increase or decrease the use of keywords in the desired direction, with reference to the average use of them, in order to boost or mitigate market reactions.

To test this hypothesis, we link the results in Table 6 to the study of keywords for each period. We are interested in seeing when the average of each period is higher or lower than the overall average (the reference point), but we also want to see if values are under/above average during positive/negative market trends.

In table 7, we show the use of keywords within the different time spans. Darkened cells are the ones in which the values are above average, while clear cells are the ones whose values are below average.

Table 5. Keywords use and market trends

Period	S&P500		Grow*	Earn/EPS	Profit	Perform
Overall	Reference point		2.87	4.90	1.04	1.76
1	-6.88%	Down	4.7	11.0	0.0	-0.3
2	14.17%	Up	1.9	7.1	1.4	4.0
3	-12.52%	Down	3.7	8.7	1.5	0.0
4	15.15%	Up	2.4	3.2	3.3	2.1
5	8.73%	Up	6.5	5.5	3.0	4.0
6	-6.79%	Down	3.5	8.2	1.3	2.7
7	-16.39%	Down	3.0	4.5	2.4	0.7
8	13.58%	Up	0.5	2.5	4.0	1.3

For example, during the negative market period in which the index performed – 6.88%, the overall average use of the keyword *Grow* was 2.87 and the period average use 4.7. In such case, we claim that this evidence denotes analysts' reluctance in conveying bad news to the market, as the average number of the keyword is higher than the reference point.

Reading table 7 vertically, by columns, we notice that the keyword *Perform* is the most coherent with the index trend: in five out of eight periods, the values vary in the same direction as S&P 500. On the other hand, *Grow* diverges in six out of eight cases. *Earn/EPS* and *Profit* seem to behave rather independently. By reading the table horizontally, by rows, we have a further appraisal. In the first period, the index performs -6.88%, while keywords are mostly used with a positive meaning and two of them have a higher value than average. Period 3 is negative marketwise, and again positive keywords are used more than negative ones, three out of four of them being above average. In period 6, the mentioned tendency is even clearer, since all keywords are used in a positive sense above the time series average, enforcing the perception of analysts' optimism in spite of market performance. In period 7, instead, the tendency is not as clear, but still present. During positive market trend periods, although the positive use of keywords still prevails, we see a different behavior: in period 2 three out of four keywords are used with an above-average frequency, in period 4 above and below averages are equal, in period 8 below-average use is clear, and finally, in period 5 the opposite maintains.

Similar findings can be referred to BB reports, though keywords were diverse due to their different relevance in the documents.

Summing up, though we fell we still do not have a definitive evidence that the analyst's behavior clearly follows the prospect theory value function, we consider the main intuition quite sustainable. Thus, the basic idea that financial analysts behave as posed by Kahneman and Tversky holds.

Conclusions

Multidisciplinary studies of financial analyst reports appear to be the frontline of a new research approach to market actors' behavior. Linguistic analysis helps in interpreting cognitive biases present in the information conveyed to the market by professional analysts and, possibly, managers. We find that analysts tend to minimize the risk of jeopardizing their reputation using sound linguistic strategies, avoiding, when possible, to assess clear and univocal claims, referring to numerical supports and insiders' statements to enforce their conclusions.

Clearly they tend to avoid personal opinions, always leaving room for justifying possible errors. They seem to follow a value function that still has to be derived and tested empirically, which, however, seems to be quite similar to the one proposed in prospect theory. That is to say that professional analysts avoid reputational risk in the positive domain, while seem to be more risk takers in the negative one, with respect to a reference point represented by their *status quo*, i.e., their reputation when they issue the report.

More research work is needed to derive and empirically test such value function. We are carrying out this work using databases from some of world's most important investment banks, such as Goldman Sachs, JP Morgan Chase, UBS, Barclays and others.

The aim is to define the value function, to find and classify cognitive biases specific for financial analysts and, possibly, define a numerical parameter that allows weighting the actual credibility of financial public information.

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