

ANALYSTS' DISTORTED VALUATION OF HI-TECH STOCKS

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Abstract

This paper aims to examine the distorted valuations of internet companies during the dot.com bubble. The analysis is performed through a clinical study of Tiscali, the most known Italian internet company at the time. First, its IPO is presented, underlining the presence of the three typical phenomena: the decision to go public during a hot issue market, the initial underpricing, and the long run underperformance. Second, a content analysis of the reports issued by analysts in the period 1999-2001 shows the most common mistakes in using relative market valuation techniques. Third, an event study analysis shows the market reaction following acquisition deals announcements was often driven by irrational exuberance during the internet craze, but also that after the bubble burst the market eventually understood analysts over optimism. Other behavioral biases like overconfidence, but also heuristics like anchoring are discussed in the paper, as well as the need for analysts' to insert in their toolbox new instruments provided by the behavioral finance literature.**

Keywords: Analysts, Distorted Valuation, Internet Bubble, Overconfidence, Conflicts of Interests

JEL Classification: G14

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1 Introduction

Internet companies' valuation has attracted an enormous interest during the Internet bubble of end of the 1990s – beginning of 2000s both among market participants and academics. At its peak (March, 2000), the valuation of these firms reached extraordinary high levels, competing with older and more established companies. At the time, stock markets saw their value rapidly increase mainly thank to the growth in the new Internet sector.¹⁵ Large positive stock market reactions followed the announcements of name changes of corporations to Internet related dotcom names. This “dotcom” effect originated cumulative abnormal returns up to 74% over the ten days surrounding the announcement day (Cooper et al., 2000).

After the bubble, financial analysts have been accused of having overstated the value of internet companies. This paper mainly aims to examine the distortions that affected analysts' valuations during the “dotcom” craze.

In highlight the most common mistakes committed by analysts in their reports on internet companies, it is possible to trace them back to the

most popular biases examined in the behavioral finance literature. Analysts had a major role in spreading the so-called “irrational exuberance” (Shiller, 2000) that affected stock markets in those years.

While excessive optimism and overconfidence in their skills may have caused such distorted valuations, also potential conflicts of interests partly explain such distortions. As a matter of fact, while analysts' role is to issue valuable information to their clients, at the same time they work for investment banks that do business with the covered companies.

Analysts, however, are not the only focus of this paper since also the stock market reaction, thus investors' behavior, is considered.

The paper is a clinical study on Tiscali – the most representative Italian internet company at the time of the dotcom bubble – that has been analyzed between 1999 and 2001. During this period, the company reached its highest market capitalization (on March, 10 2000) and expanded through a series of acquisitions of the most active internet companies in Europe.

The paper is organized as follows: section 2 present a brief survey of the relevant literature; section 3 describes the database and the methodology used that includes both a content analysis of analysts' reports issued on the company, as well as an event study of the market reaction to major corporate

¹⁵ The stocks belonging to this sector were valued 35 times their aggregate revenues and had a target price/earnings ratio as high as 605.

events; section 4 presents the results obtained through the analysis of Tiscali's IPO, the content analysis of reports and the event study to measure the market reaction; section 5 concludes.

2 Literature review

Studies in the literature deal with the valuation of internet companies and the role of analysts in the dotcom bubble from different angles. Since during that period several high tech companies benefited from the market upward phase to go public, many studies analyzing the internet bubble regarded the IPO process.

Tiscali's IPO is the most emblematic example of the impact of the "new economy" on the Italian market. The analysis that follows deals with its listing on the Italian Stock Exchange (Borsa Italiana), with particular regard to its timing and to the initial underpricing on the first trading day. Furthermore, the analysis of the medium term performance has been carried out.

Thus, the three typical "regularities" related to IPOs – hot issue markets, initial underpricing, long run underperformance (Ritter, 1984) – have been analyzed using both the traditional approach (Brealey, Myers and Allen, 2010) as well as the behavioral one (Shefrin, 2006).

In IPOs, the degree of asymmetric information between the management of the company and investors is very high. In case of uncertainty, investors tend to rely on heuristics, i.e., rules of thumb that help in taking decisions. In case of asymmetric information, the so-called "bandwagon effect" (Welch, 1992) can take place in the market. The latter effect, also known as "information cascade", refers to investors' preference to buy the stocks of companies that recently went public, and that have already attracted other investors' attention, i.e., that are considered "hot". Relying on the behavior of the crowd, rather than on their own judgements, investors are able to minimize the potential future regret that they may feel in case of the choice of the stock turns out to be erroneous.

The expression "hot market" refers to a period when valuations are irrationally over-optimistic. In these periods, the average first month performance of IPOs is particularly high (Ibbotson and Jaffe, 1975). IPOs usually tend to concentrate in periods of high initial underpricing – i.e., the fact that the offer price is below the closing price of the first day of trading (Purnanandam and Swaminathan, 2004) – creating a "windows of opportunity" to go public (Loughran, Ritter and Rydqvist's, 1994).

An alternative explanation of the initial underpricing comes from the theories related to the bookbuilding process based on the "market feedback" hypothesis (Benveniste and Wilhelm, 1990), and the "agency conflict theory" (Jensen and Meckling, 1976). Following these theories, a company is willing

to accept a low offer price to create a "demand effect", i.e., to be sure that the demand of its stocks will exceed the offering, thus being sure of the success of the IPO. Also, underwriters seem to assure the company's management that the stock will be followed by a highly rated analyst, emphasizing the positive effects that the coverage is likely to have on the future stock price.

Many studies documented analysts' over optimism. Analysts may be overly optimistic because of potential conflicts of interest (Dugar and Nathan, 1995), but also due to cognitive reasons. In this latter respect, McNichols and O'Brien (1997) found that analysts tend to initiate to cover a stock because they are optimistic about its future prospects. This evidence underlines a selection bias problem: only excessively optimistic analysts, on average, decide to cover companies. Analysts are not only over optimistic, but they also tend to be overconfident with respect to their skills (Nicholson, William, Fenton-O'Creevy and Soane, 1998; Barber and Odean, 2000).

The idea of "fads", instead, could explain long-term underperformance of IPOs (Aggarwal and Rivoli, 1990). More in general, behavioral finance studies argue that while the initial underpricing represents an overreaction of the market, the long run underperformance is nothing but a correction of this former misvaluation. Furthermore, analysts can be distorted in their valuations by heuristics. A typical heuristic that affects analyst's behavior is called anchoring, i.e., the tendency to remain mentally anchored to a particular reference point (the mental "anchor"), even if this later proves to be irrelevant for the decision that had to be taken. Investors, use this heuristic in deciding whether to invest or not in a stock. They tend to anchor either to the maximum price reached in the past by the stock, or the one at which they initially purchased it. Although it may seem unlikely for professionals like analysts, to be subject to anchoring, it affects their valuation since estimated target prices are often too close to current stock prices.

With respect to market reaction, Womack (1996) calculated that the market reaction to analysts' recommendation changes in case of upgrade was 2.4%, while for downgrades the abnormal return was definitely higher and equal to - 9.1%. This asymmetry is due to analysts' reluctance in conveying negative news (Piras, Denti and Cervellati, 2012). However, since investors are aware about this fact, they react in a very negative way. Barber, Lehavy, McNichols and Trueman (2001) studied if analysts' consensus recommendation can be valuable for investors, i.e., if they could rely on their reports to implement profitable investment strategies. They confirmed that analysts' recommendations are valuable for investors, but mainly in the very short run. Brav and Lehavy (2003), found that the market significantly reacts to changes in target prices. The reaction was positive for upgrades, but negative for downgrades. Bradley,

Bradford and Ritter (2003) showed that analysts started their coverage immediately after the IPO in 76% of cases and with a positive judgement. In a five days window, the analyzed companies recorded an abnormal return of about 4.1%, against 0.1% for those which were not covered by analysts' reports.¹⁶ The fact that a recommendation came from one of the company's underwriter or not seemed not to affect these results.

With regard to the Italian stock market, Fabrizio (2001) examined analysts' reports on Italian listed companies in the period 1998-1999, underlining that 58.2% of the reports contained buy recommendations while only 6.1% were sell. Furthermore, brokers were generally more interested in bigger companies or in those with good growth perspectives. Bertoni, Giudici, Randone and Rorai (2002) analyzed all the report on companies listed on Borsa Italiana¹⁷ between 1999 and 2001, and showed four interesting phenomena: (i) analysts' valuations were systematically over optimistic; (ii) recommendations tended to converge, regardless of the market cycle; (iii) valuations of analysts affiliated with the IPO underwriters were generally the most optimistic, raising doubt of potential conflicts of interests; (iv) limited reports circulation caused information asymmetry between institutional and individual investors, negatively affecting market efficiency.¹⁸

3 Methodology and sample description

In this paper, two distinct analysis have been performed. The first one is a content analysis that has been divided into three sections, distinguishing between the reports analyzing: the merger with World Online, the acquisition of Liberty Surf, and, finally, other smaller acquisitions. The second one is a traditional "event study" with two main purposes: to verify, calculating Cumulative Abnormal Returns (CARs), the market reaction to the announcements of Tiscali's acquisitions, and to understand the relationship between investors' behavior and analysts' recommendations.

In little more than one year, Tiscali passed from being a small Italian telecom company to become the leader of the European internet sector. The company developed a complex business model merging the typical structure of telecom companies with the one used by modern Internet Service Providers (ISP). Such a company was not easy to evaluate, and analysts raised concerns with regard to the difficulties in calculating the value of internet companies.

Furthermore, Tiscali was a startup, and the valuation of new ventures is definitely more difficult compared to calculating the value for already established companies, especially if in the high tech sector. In these cases, it is difficult to correctly identify how the company could develop its innovative ideas to create future market and growth opportunity, and eventually cash flows. As often happened for hi-tech companies, Tiscali's financial results in the short term were negative, due to the high investments in IT and marketing. However – and this is an important aspect of the whole story – the company devoted a lot of funds to merger and acquisition (M&A) deals. In addition, like other internet firms, the company changed its business model and organization quite often in those years, complicating even further analysts' work. Thus, their struggle to evaluate Tiscali was justified.

However, also psychological issues played a major role, as the paper will clarify, both in the company top management choices and in analysts valuations.

To conduct the content analysis, all the reports issued between October 1999 and the first half of 2001 have been considered. The detailed analysis of these reports underlined several contradictions and inaccuracies in the reports. Analysts were not always able to explain the real consequences of Tiscali's investment decisions and acquisition activity using traditional financial valuation methods. Often, analysts preferred to use "new valuation methods" applied at the time to discern the value of the so-called "New Economy" companies. The number of subscribers and the growth potential, rather than cash flows, became the new basics for valuation. Of course, these variables were not necessarily linked to the value of the company, as the market assessed thereafter. Lastly, with regard to the event study, particular attention has been dedicated to verify the market reaction to recommendation changes and to Tiscali's investment decisions and acquisitions.

3.1 Analysis of the IPO process

Tiscali's IPO took place on October, 27 1999 with ABN Amro Rothschild and Banca IMI as global coordinators of the combined offering. The offer price was €46 per share and the stock was admitted to listing on the Nuovo Mercato, the segment of the Italian Stock Exchange created in the same year and dedicated to the small and medium companies active in the technological sector.

While the calculation of Tiscali's initial underpricing is straightforward since it is given by the difference between the closing price on the first trading day and the offer price, to analyze the long run underperformance, a definition of the market return is needed to calculate abnormal returns. A possible choice would have been to take the Numtel, i.e., the index of the Nuovo Mercato. If on one hand that

¹⁶ The largest abnormal returns were found for those companies covered by more than one analyst.

¹⁷ The reports are publicly and freely available on Borsa Italiana's website. Borsa Italiana is the managing company of the Italian Stock Exchange.

¹⁸ Also see Belcredi, Bozzi and Rigamonti (2003), Cervellati *et al.* (2007a, 2007b, 2008).

would have been an appropriate choice since this latter index represent companies in high-tech sector – thus more close to Tiscali – on the other hand the large market capitalization of the company during the internet bubble created a situation in which it made up a great part of the Numtel. Thus, this index has been discarded, while the more general Mibtel (*Milano Indice Borsa Telematica*) has been chosen since it represents the whole Italian Stock Exchange.

3.2 Content analysis of analysts' reports

All the reports issued between the IPO date and the first half of 2001 have been analyzed. The reason to stop analyzing reports in this period is that the last

important acquisition made by Tiscali to achieve the leadership in the European internet sector – the target company was Line One – was announced on April, 25 2001. More attention has been devoted to the most relevant reports, i.e., those dealing with the valuation of M&A deals.

It is interesting to analyze these reports since it is possible to underline the distinct valuation techniques used by analysts. Table 1 summarizes the main acquisitions made by the company in the considered period (Most of the reports in the sample focus on two deals: the merger with World Online and the acquisition of Liberty Surf. The other deals did not receive the same attention by analysts).

Table 1. Main European acquisitions made by Tiscali by date of deal announcement

Date	Company	Sector/Type	Nationality
23/12/99	Nets SA; A Telecom SA	Telecom	French
14/01/00	Datacomm AG	ISP	Swiss
24/01/00	cd-Telekomunikace	Telecom	Czech
03/02/00	Ideare Srl	Internet	Italian
10/02/00	Link line	ISP	Belgian
25/02/00	Nikoma Beteiligungs GmbH	Telecom	German
13/03/00	Interweb Sprl	ISP	Belgian
12/05/00	Quinary	IT	Italian
07/09/00	World Online	ISP	Anglo-Belgian
20/12/00	Addcom	ISP	German
08/01/01	Liberty Surf	ISP	French
12/02/01	Excite Italia	ISP	Italian
12/04/01	Planet Interkom	ISP	German
24/04/01	SurfEU	ISP	German
25/04/01	Line One (Springboard Internet Service Ltd)	ISP	British

Before applying the content analysis on the reports, a classification of the recommendation is needed to investigate the effects of the information issued by analysts. Recommendations have thus been divided into five distinct categories: Buy, Outperform/Add, Neutral/Hold/Market Perform, Underperform/Reduce, Sell (In practice, some of these terms are used to mean the same

recommendation. In this respect, “outperform” or “add” have similar meaning, as well as “neutral”, “hold” and “market perform” may be considered as interchangeable, like “underperform” or “reduce”. This is why in Table 2, only one term is used for each kind of recommendation). Table 2 presents such classification per year of reports' issuance.

Table 2. Number of reports on Tiscali by type of recommendation and year of (1999-2001)

Year	Recommendation				
	Buy	Add	Neutral	Reduce	Sell
1999	2	-	-	-	-
2000	6	2	11	2	3
2001	4	1	28	17	5
Total	12	3	39	19	8

While in 2000 there were six buy and eleven neutral recommendation, in 2001 there were only four buys while the number of neutral recommendations

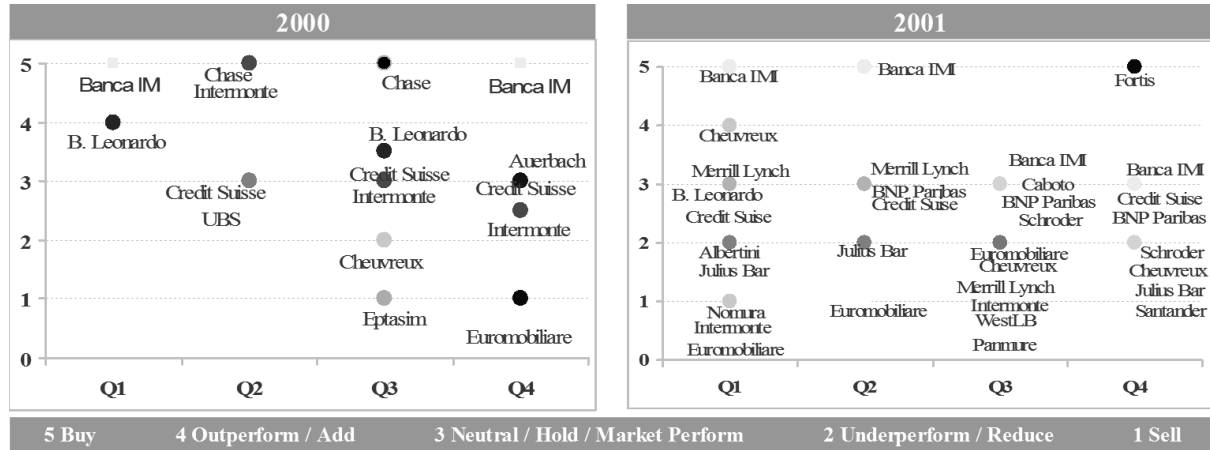
grown to 28, with a strong increase in negative ratings like reduce or sell. This is a clear indication of how analysts change their mind with regard to Tiscali after

the burst of the bubble (The peak of the bubble can be identified around March 2000).

Aggregating the reports by quarter, based on their issuance date, it is possible to show the trend

followed by recommendations, as depicted in Figure 1. It is straightforward to see a downward sloping trend in analysts' rating from 2000 to 2001.

Figure 1. Analysts' reports by quarter and type of recommendation (2000-2001)



3.3 Event study

While the content analysis showed Tiscali's main acquisitions through the study of analysts' reports, the event study that follows measure the market reactions to their announcements. Average abnormal returns (ARs) are calculated taking as index the Mibtel, for the reasons that were mentioned above. A window of ten days surrounding the event date is considered: [-5; +5]. The returns of both the stock and the index, at time t , have been calculated as natural logarithm of the ratio between the price at time t and the price at $t-1$: $R_{i,t} = \ln(p_{i,t} / p_{i,t-1})$ (Stock and the index prices have been obtained from Datastream). To measure ARs, the "market adjusted model" has been chosen. To catch the market reaction to the issuance of positive or negative recommendations, two distinct models have been considered:

$$R_t = \alpha + \beta \times R_m + \gamma \times \lambda_{POS} + \varepsilon_t$$

$$R_t = \alpha + \beta \times R_m + \gamma \times \lambda_{NEG} + \varepsilon_t$$

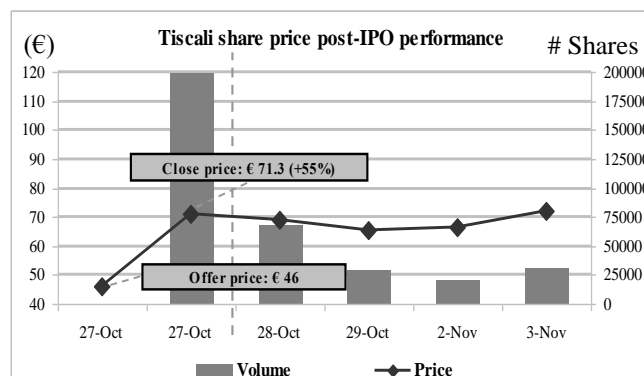
The only difference between them is that in the first model the dummy λ_{POS} catches the effects of the publication of positive ratings on the stock returns, while in the second one the dummy λ_{NEG} explains the effects of negative recommendations. This means that if the analyst's recommendation is positive, λ_{POS} will be equal to 1 and λ_{NEG} to 0, vice versa if the recommendation is negative. The purpose is to verify the null hypothesis of "absence of the effect of the recommendation" through a simple T-test for the parameter γ .

4 Empirical results

4.1 IPO

The closing price of the Tiscali' stock in the first trading day was € 71.3, an underpricing of 55% compared to the offer price of € 46 (see Figure 2).

Figure 2. Tiscali's initial underpricing

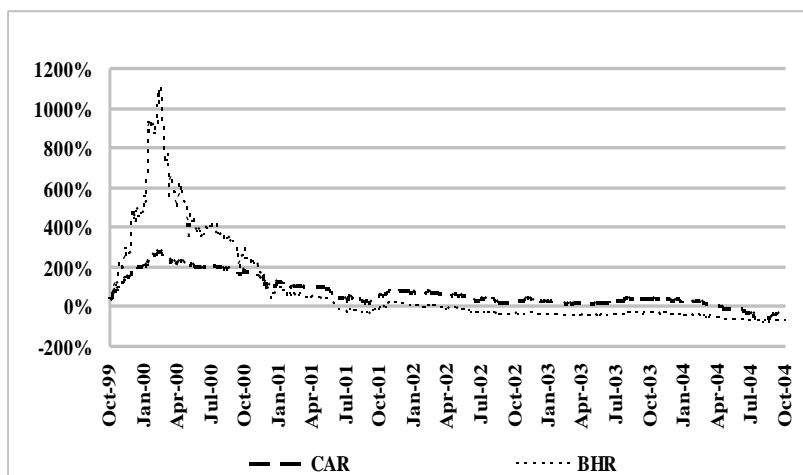


Tiscali was not an isolated case. During the dotcom bubble, other IPOs in the Italian Stock Exchange recorded high level of underpricing. Finmatica (Finmatica was an Italian a software provider for the banking sector. In 2004, it declared bankruptcy) was the most impressive example, with an initial underpricing of +686.8%. The period 1998-

2001 showed the highest concentration of IPOs since the '80s, with 85 IPOs from 1995 to 1997, definitely an "hot issue market".

In terms of long run underperformance, the CARs and BHRs have been calculated considering a 5 year window, from October, 27 1999 to the same day in 2004, as shown in Figure 3.

Figure 3. CARs and BHRs for Tiscali's stock in the five years after the IPO



The BHRs line is steeper than the CAR at the peak of the bubble, since the way BHRs are calculated amplifies extreme returns. In this respect, the 1,100% BHRs peak shown in Figure 3 dates back to March, 10 2000, when Tiscali's stock price was about € 1,200.

4.2 Content analysis of the research reports

With regard to analysts' valuations on Tiscali, it should be underlined their poor knowledge of the internet sector and the consequent difficulties in predicting its future evolution. According to behavioral finance, even professionals like analysts are subject to cognitive errors and use heuristics to take decisions, especially when they face a great deal of uncertainty. To show how analysts tried to cope with this uncertainty, an analysis of their reports covering Tiscali's acquisitions follows.

To become the leader in the European internet sector, the top management implemented a series of acquisitions, generally financed through new shares

issues. Tiscali acquired the biggest internet companies in Europe, like World Online which, with its network in optic fibre represented its most ambitious deal. The leadership in the European internet sector was achieved on April 25th, 2001 with the purchase of Line One, a leading British ISP and fourth web portal in United Kingdom, co-owned by British Telecom and United Business Media. Thanks to this acquisition, Tiscali overcame its strongest competitor, the German T-Online, thus becoming the first ISP in Europe.

4.2.1 The merger with World Online

World Online ("WOL" from now on), was an Anglo-Belgian company with 2.3 million active users. Tiscali acquired WOL, paying in stocks: 0,4891 own shares for each WOL share. The deal adviser, UBS, valued the deal €5.9bn.

The target prices and recommendations contained in the reports analyzing the deal and estimating the combined company value are shown in Table 3.

Table 3. Research reports valuating the merger with World online

Broker	Date	Target price (€)	Recommendation
Banca Leonardo	06/09/00	55	Market Outperform
Credit Suisse	07/09/00	-	Hold
Credit Suisse	15/09/00	-	Hold
Chase	08/09/00	60	Buy
Intermonte Sec.	11/09/00	43	Neutral
Centrosim	25/10/00	36 - 38	Market Perform
Banca IMI	28/11/00	42.6 - 51	Buy

The valuation methods used in these studies are based on multiples. While sometimes they used traditional multiples like EV/Sales, they also use some “innovative” ratios using different categories of subscribers like EV/Subscribers, EV/Active subscribers, EV/Unique subscribers, EV/Latest subscribers, or even EV/Page view, assuming that the number of pages viewed could be a proxy for value. The EV/Subscribers ratio has been often used to determine the value of internet companies.

Analysts seemed to think that this multiple could solve the issues related to internet companies’ valuation, given the impossibility of using traditional multipliers due to their lack of profitability.

However, these multiples proved to be unable neither to provide a measure of the subscribers’ fidelity nor to produce real value for the companies.

Table 4 compares these two types of multiple.

Table 4. Revenue and user multiples between 2000 and 2002, by broker

Broker	EV/Sales x			EV/Subscribers x		
	2000E	2001E	2002E	Current	2001E	2002E
Centrosim	27.0	7.0	-	-	-	-
Banca IMI	20.7	6.9	5.0	1,219	-	-
Banca Leonardo	35.4	19.6	11.4	1,965	1,339	1,088
Chase	-	-	-	-	-	-
Credit Suisse	-	-	-	-	-	-
Credit Suisse	26.0	12.0	-	3,016	-	-
Intermonte Sec.	28.3	13.1	8.4	2,561	1,646	1,234

The most relevant ones refer to the subscriber multiple, which ranges from 1,219x for Banca IMI to 3,016x for Credit Suisse in 2000. This large range can be explained with the poor reliability of the data about subscribers, but also with analysts’ little expertise using these new multiples.

Instead, with regard to the EV/Sales multiplier, the degree of variability in estimates for 2000 was definitely lower, probably underlining the greatest confidence analysts had with traditional ratios.

4.2.2 The acquisition of Liberty Surf

Just after having completed the deal with World Online, Tiscali announced the purchase of the 72.94% of voting rights of Liberty Surf, the second French ISP behind Wanadoo. Liberty Surf stock was estimated € 9.83, for a total amount of € 900 billion. With this acquisition, Tiscali got close to become the leading European web portal, with ten million registered users and 4.9 million active users, immediately after the German T-Online (owned by Deutsche Telekom).

Table 5 shows target prices and recommendations contained in the reports analyzing the deal.

Table 5. Research reports valuating the acquisition of Liberty Surf

Broker	Date	Target price (€)	Recommendation
Albertini	09/01/01	-	Reduce
Credit Suisse	09/01/01	-	Hold
Euromobiliare*	09/01/01	12	Reduce
	16/02/01	12	Sell
Chevreurx	11/01/01	21	Outperform
Intermonte Sec.*	11/01/01	15	Underperform
Banca IMI*	23/01/01	41	Buy
Banca Leonardo*	26/01/01	19,1	Hold
Merrill Lynch	16/02/01	-	Neutral

* Reports where Tiscali has been valuated with the Discounted Cash Flows (DCF) method¹⁹

¹⁹ In January and February 2001, Tiscali’s share price (adjusted after stock splits and new rights issues) ranged between €12 and €20.3. It is possible to notice that all target prices issued in this period were aligned to the actual Tiscali share price, with the exception of the one calculated by Banca IMI.

It is interesting to note that, while only few months had passed since the WOL deal, most analysts revised their valuation techniques, rehabilitating the DCF method, previously considered unable to grasp the internet companies' growth opportunities.

Half of the reports examining the acquisition of Liberty Surf adopted the DCF methodology together with relative valuation methods (multiples). However,

in that period it was quite evident analysts' uncertainty about the future of the internet sector. This uncertainty affected both their relative valuation - through the unclear projections analysts developed on revenues, EBITDA and earnings - and DCF estimates that seemed to depend on discretionary assumptions. As for DCF, Table 6 describes the main differences between analysts' models.

Table 6. Details of the DCF models (beta, WACC and growth rate) by broker

Broker	Beta	WACC (%)	Growth, g (%)
Banca IMI	1.97	10	5
Banca Leonardo	1.7 - 1.8	11.7 - 12.1	4.0 - 4.5
Euromobiliare	2.0	10	5
Intermonte Sec.	-	10.6	5.5

With regard to multipliers, Table 7 shows large ranges in values: $6.3 < (EV/Sales)_{2000} < 15.5$; $438 < (EV/Current\ Active\ Subs)_{2000} < 1.263$; $438 < (EV/Subs)_{2000} < 1.263$. This variability was due to

poor estimates of revenues and subscribers that analysts were able to develop from the limited information available, and that produced very heterogeneous valuations.

Table 7. Revenue and subscriber multiples between 2000 and 2002

Broker	EV/Sales (x)			EV/Subs (€)		
	2000E	2001E	2002E	Current	2001E	2002E
Albertini	-	-	-	722	-	-
Banca IMI	14.6	6.0	4.6	1,243	-	-
Banca Leonardo	15.5	7.6	5.4	1,263	791	582
Cheuvreux	-	5.0	3.6	-	-	660
Credit Suisse	-	3.0	-	438	-	-
Euromobiliare	6.3	3.2	-	617	-	-
Euromobiliare	12.6	6.7	-	1,054	-	-
Intermonte Sec.	8.5	4.1	-	862	-	-
Merrill Lynch	8.8	5.4	3.9	834	561	405

3.3.3 Other minor acquisitions

In the first quarter of 2000, despite the recent IPO and the starting of its campaign of acquisitions in Europe, the reports on Tiscali were just two: Banca Leonardo, on January, 1, and Banca IMI, on March, 17.

Banca Leonardo issued its report after the acquisition of the two French telecom companies, Nets SA and A Telecom SA, announced on December, 23 1999.

The report by Banca IMI, instead, was released after six deals which, in addition to the above-mentioned companies, involved: the Swiss ISP DataComm AG, the Czech telecom company cd-Telekomunikace, the German ISP, the telecom firm Nikoma, the Belgian Link Line and the portal Interweb.

Analysts of both banks adopted a Sum of the Parts ("SOTP") approach, which Banca Leonardo added to its DCF model and its multiples. The parts into which the analysts distinguished the company were almost the same: Voice, Internet, International Acquisitions and UMTS.

With regard to the second quarter of 2000, the most complete reports of were issued by: Chase (May, 17), Credit Suisse (June, 12), Intermonte Securities (May, 2 and 16) and UBS (June, 8).

Instead of focusing on specific deals, these reports provided a valuation of Tiscali after the series of acquisitions the company announced in the previous quarter.

Also in these reports, multiples were the most used valuation method. However, Intermonte, Chase and UBS adopted DCF as well.

The third quarter of 2000 was characterized by a larger number of reports, even if part of them were focusing on the merger with WOL. The remaining reports were issued by Cheuvreux (July, 10) and Credit Suisse (August, 31) before the WOL deal. While Credit Suisse adopted a peer comparison approach, Cheuvreux proposed a DCF model in addition to it.

The reports referring to the fourth quarter of 2000 are instead four and were issued by Credit Suisse (November, 15), Euromobiliare (November,

16) and Intermonte Securities (November, 16 and December, 5).

The report by Credit Suisse is just an update of the analyst's valuation after the announcements of the quarterly results. Thus, it does not contain any model of valuation.

Both analysts of Euromobiliare and Intermonte, instead, adopted relative valuation methods (multipliers) and only Intermonte also used the DCF method.

The reports issued in this period showed a different point of view in comparison with those of the first months of the year, still characterized by excessively optimistic estimates. This trend inversion, however, was not shared by all analysts.

An example is provided by Banca IMI who, in the report dated November, 28 (see Table 5), in contrast to the majority of the neutral and underperform recommendations, issued a buy.

In the first quarter of 2001, analysts were focusing on the acquisition of Liberty Surf, announced on January, 8. Among the reports that did not focus on the deal, the following have been analyzed: Intermonte (February, 16 and March, 29), Julius Bar (February, 15 and March, 21), Merrill Lynch (February, 13 and 15, and March, 29) and Nomura (February, 28).

The majority of these studies are brief updates, where analysts revised their estimates after the announcement of the results of the fourth quarter. The valuation of the company in these reports was, on average, negative. This was due to the fact that the Q4 results were below expectations and that the new acquisitions Tiscali had announced in Germany and UK were not considered useful to increase neither the number of users nor the value of the company. Most analysts still relied on the multiples, with the exception of those of Julius Bar and Nomura, who used, in addition, DCF.

The second quarter of 2001 was rich of studies, most of which concentrated in May, after the three acquisitions announced in April: Planet Interkom (April, 12), SurfEU (April, 24) and LineOne (April, 25).

Table 8 shows the variability characterizing both target prices and recommendations contained in these studies, varying from €9 to €22 and from Sell to Buy, respectively. While the reports issued by Julius Bar and Merrill Lynch are just updates, with no valuation, in the others, the company has been evaluated using multiples (EV/Sales, EV/Subs) and the DCF.

The content analysis of analysts' reports has shown that, on average, during the internet craze there was great uncertainty about the right method to use in order to value internet companies. The DCF and the other traditional methods were deemed unsuitable to value this new sector with its peculiar characteristics

(i.e., high capital expenditures, negative initial cash flows, high growth rates etc).

Thus, analysts preferred to use multiples based on either revenues or the number of subscribers, proving that they were not able to handle them to value internet companies.

Even if they are easy to use, multipliers are approximations to value of a company. In the behavioral finance terminology, they can be considered as valuation heuristics (Shefrin, 2006).

The most common problems in analysts' use of multiples are mentioned below.

First, analysts had problems in finding Tiscali's comparable companies since they had to be active in the same sector, but also have similar business models, financial structure and growth rates. However, analyzing the reports it is clear that the peers they chose were different from report to report and in some cases they included companies listed in a US stock exchange.

Second, analysts disagreed on the identification of most appropriate multiple to use in valuing internet companies. For example, with regard to revenue multiples, while some analysts considered just the proceeds from advertising and e-commerce, others used the company's total revenues, thus including access, connectivity and web hosting proceeds. As a consequence, these different choices led to different Enterprise Values. Also for multipliers using the number of subscribers, there were similar issues. In particular, analysts have difficulty in learn the exact number of the company's subscribers.

Third, the some multiples were too variable and incapable of measuring the company's value. This was particularly true for the subscribers' multiple, adopted by analysts in several versions. For example, analysts used current or future visitors, occasional or regular ones, unique visitors and subscribers, ending up with the number of pages viewed.

At the end of 2000, analysts returned using the DCF, but both growth and discount rates were different from report to report. Most of the reports analyzed were characterized by similar mistakes. A detailed analysis of them has highlighted the presence of systematic errors followed by analysts.

The most common behavioral bias among analysts and investors seemed to be the "optimism bias". It is visible both in the general euphoria that pushed investors to frantically buy the Tiscali's stock and in the over optimistic analysts' valuations. Another analysts' common used heuristic was "anchoring". Anchoring occurs when individuals, in taking decisions, tend to anchor their opinions to determined values and do not adjust sufficiently. Often, analysts issued valuations in order to obtain target prices as close as possible to the current ones.

Table 8. Reports issued after minor deals between 2000 and the first half of 2001, by quarter

Date	Broker	Target price (€)	Recommendation
Q1 2000			
10/01/00	Banca Leonardo *	506	Outperform
17/03/00	Banca IMI	1,458 - 1,682	Buy
Q2 2000			
02/05/00	Intermonte Sec. *	75	Buy
16/05/00		80	Buy
17/05/00	Chase *	80	Buy
08/06/00	UBS *	44	Hold
12/06/00	Credit Suisse	-	Hold
Q3 2000			
10/07/00	Cheuvreux *	38	Underperform
31/08/00	Credit Suisse	-	Hold
Q4 2000			
15/11/00	Credit Suisse	-	Hold
16/11/00	Euromobiliare	24	Sell
16/11/00	Intermonte Sec. *	32	Neutral
05/12/00		20.5	Underperform
Q1 2001			
16/02/01	Intermonte Sec.	12.3	Sell
29/03/01		12.3	Sell
15/02/01	Julius Bar *	13	Reduce
21/03/01		13	Reduce
13/02/01	Merrill Lynch	-	Neutral
15/02/01		-	Neutral
29/03/01		-	Neutral
28/02/01	Nomura *	14	Sell
Q2 2001			
12/04/01	Julius Bar	13	Reduce
17/04/01	Banca IMI *	-	Buy
17/05/01		22	Buy
17/04/01	Merrill Lynch	-	Neutral
21/05/01		-	Neutral
04/05/01	Credit Suisse *	9	Hold
18/05/01		9	Hold
15/05/01	BNP Paribas *	15.3	Neutral
12/06/01		15.3	Neutral
17/05/01	Euromobiliare *	12	Sell

* Reports in which Tiscali has been valued with the DCF method.

Tables 9 and 10 show the above-mentioned phenomenon, by reporting current and target prices contained in the analysts' reports.

The median difference between target prices and current prices shows the presence of anchoring on the whole observation period (24.4% in 2000, 16.7% in

2001). The widest differences refer, on average, to the reports issued in 2000, but relevant values have been found also for 2001: 103.5% for BNP Paribas and 99.7% (later on 51.4%) for Banca IMI. This last value underlines another important issue: the existence of conflicts of interest.

Table 9. Target prices vs current prices (2000)

Quarter	Broker	Target Price, TP (€)	Current Price, CP (€)	(TP – CP)/CP (%)
Q1	Banca IMI	1,458 - 1,682	1,058	37.8% - 59.0%
	Banca Leonardo	506	416	21.6%
Q2	Chase	80	57.95	37.9%
	Credit Suisse	-	52	-
	Intermonte	75	59	27.1%
		80	58	38.1%
	UBS	44	51	13.7%
Q3	Banca Leonardo	54	48	13.3%
		55	46	19.6%
	Chase	60	46	30.6%
	Cheuvreux	38	47	18.6%
	Credit Suisse	-	44	-
		-	46	-
		-	44	-
	Eptasim	-	47	-
		-	-	-
	Intermonte	46	50	8.0%
	43	47	7.5%	
Q4	Centrosim	36 - 38	40	8.9% - 3.8%
	Credit Suisse	-	34	-
	Euromobiliare	24	35.46	32.3%
	Banca IMI	42.6 - 51	34	27.2% - 52.2%
	Intermonte	32	36	9.9%
		20.5	30	30.5%
			Average	24.9%
			Median	24.4%

Both Banca IMI and ABN Amro were Tiscali's advisors in the IPO process. Banca IMI always issued positive recommendations on the company, and it reiterated its buy recommendation in 2001, when the speculative bubble had burst and most analysts eventually realized the mistakes made in their previous valuation. However, also an ABN Amro report dating back to the early part of 2000 seems to suggest potential conflicts of interest (The report has not been analyzed since it could not be found. Only the target price has been recovered from the financial press.). In February 2000, when Tiscali stock price was around € 500, the Dutch broker issued a one-year

target price of €1,000 and a long term one of €1,500, potentially causing an increase in Tiscali's share price of 36% in just one day.

A further behavioral bias that can be found analyzing the reports is the so called "hot hand fallacy", i.e., an unjustified extrapolation of past trends in formulating estimates. Thus, in bull markets analysts usually expect high returns, while in bear ones they expect low performances. A positive relationship between the bullish or bearish markets and the analysts' recommendations on the Tiscali's stock seems first to reflect their initial euphoria, then the burst of the bubble.

Table 10. Target prices vs current prices (2001)

Quarter	Broker	Target Price, TP (€)	Current Price, CP (€)	(TP – CP)/CP (%)
Q1	Albertini	-	14.3	-
	Banca Leonardo	19.0	21.0	9.5%
	Cheuvreux	21.0	16.4	28.0%
	Credit Suisse	-	13.7	-
	Euromobiliare	12.0	13.4	10.4%
		12.0	18.4	34.8%
	Banca IMI	41.0	20.5	99.7%
	Intermonte	15.0	16.2	7.4%
		12.3	16.2	24.1%
		12.3	15.2	19.1%
	Julius Bar	13.0	18.3	29.0%
		13.0	15.8	17.7%
	Merrill Lynch	-	13.7	-
		-	19.3	-
		-	18.9	-
		-	17.8	-
	-	15.2	-	
Nomura	14.0	15.3	8.7%	
Q2	BNP Paribas	15.3	14.6	4.6%
		15.3	13.2	15.9%
	Credit Suisse	9.0	15.7	42.7%
		9.0	14.7	38.8%
	Euromobiliare	12.0	14.9	19.5%
	Banca IMI	-	14.8	-
		22.0	14.5	51.4%
	Julius Bar	13.0	15.0	13.3%
	Merrill Lynch	-	15.0	-
		-	14.3	-
Q3	BNP Paribas	-	8.0	-
		-	7.0	-
		-	7.4	-
		-	-	-
		15.3	7.5	103.5%
		-	7.7	-
		-	5.0	-
	Caboto	-	7.3	-
	Cheuvreux	6.0	7.2	16.7%
	Euromobiliare	6.6	7.3	9.6%
	Banca IMI	7.3	7.3	0.7%
	Intermonte	6.5	7.3	11.0%
	Merrill Lynch	-	10.0	-
		7.6	9.0	15.1%
		-	7.6	-
		7.6	9.0	15.1%
		7.6	7.2	5.6%
Schroder	7.0	6.9	1.6%	
WestLB Panmure	5.5	6.8	19.1%	
Q4	BNP Paribas	-	7.7	-
	Cheuvreux	-	8.2	-
	Credit Suisse	6.0	8.7	31.0%
	Fortis	13.5	10.3	30.7%
	Banca IMI	9.5	8.7	9.2%
	Julius Bar	-	8.7	-
	Rasfin	7.8	11.3	31.0%
	Santander	6.8	8.0	15.5%
			Average	23.9%
			Median	16.7%

4.3 Event study

The parameters estimation, obtained through the ordinary least squared (OLS) regression, shows that analysts' recommendations, whether positive or negative, seem statistically meaningless. Recommendations cannot help properly explaining

the observed abnormal returns, probably due to different factors, other than the publication of analysts' reports. Only the coefficient associated to the market index return, R_m , is statistically significant, as shown in Table 11.

Table 11. Regression Analysis

Coefficient	Positive Model (551 observations)	Negative Model (551 observations)
Const	0.00142328 (0.6627)	0.00174316 (0.8051)
R_m	1.89688*** (12.56)	1.89095*** (12.51)
D_Pos	0.000358063 (0.02561)	-
D_Neg	-	-0.00779918 (-0.7188)
Adj. R ²	0.22084	0.22157
F(2, 548)	78.9435 (p-value = 0.0000)	79.2758 (p-value = 0.0000)

The first column in Table 11 contains the estimated coefficients: the constant, α , the coefficient of the market return variable, β , the coefficients of the D_Pos / D_Neg dummy, γ , depending on the model.

For both models, the following values have been reported: the adjusted R-squared, measuring the grade of the linear relationship between the dependent variable and the independent ones, and the value of the F statistics with (2, 548) degrees of freedom. In parenthesis, the values of the T-statistics are presented (Three stars measure the statistical significance of the coefficient for an interval of confidence of 99%).

The effect that recommendation changes had on the stock returns have been analyzed using CARs, considering a three day window around the issuance date containing the recommendations changes (Table 12). In panel A, the raw returns (ABS), the ARs and

the CARs on the 3 days windows surrounding the report' issuance date are presented for year 2000. Panel B presents the same figures for year 2001.

Looking at Table 12, it is possible to notice that recommendation changes (in bold) are just ten, because most analysts decided to watch the evolution of Tiscali remaining Neutral. The ones who changed their recommendations are Intermonte (from buy on May, 16 2000 to neutral on August, 10 2000, then to underperform on December, 5 2000 ending up to sell on February, 16 2001, before going back to underperform on August, 31 2001), Banca Leonardo (from outperform on September, 7 2000 to hold on January, 26 2001), Merrill Lynch (from neutral on July, 5 2001 to reduce on August, 6 2001), and Banca IMI (from buy on May, 17 2001 to hold on August, 30 2001).

Table 12 Panel A. ABSs, ARs and CARs

Date	Broker	Recommendation	R_Tis (%)	ABS (%)	AR %	CAR %
10/01/2000	Banca Leonardo	Outperform	+0.04	0.04	+1.05	+15.67
17/03/2000	Banca IMI	Buy	+1.67	1.67	+0.20	-15.95
02/05/2000	Intermonte	Buy	+9.77	9.77	+6.57	+19.72
16/05/2000	Intermonte	Buy	+2.98	2.98	+1.27	-1.45
17/05/2000	Chase	Buy	-2.98	2.98	-0.65	+0.04
08/06/2000	UBS	Hold	+4.76	4.76	+5.15	-1.73
12/06/2000	Credit Suisse	Hold	-4.02	4.02	-3.55	-8.99
10/07/2000	Cheuvreux	Underperform	+1.06	1.06	+1.10	+4.65
10/08/2000	Intermonte	Neutral	-3.67	3.67	-4.10	-7.89
18/08/2000	Eptasim	Sell	+0.96	0.96	+1.47	-1.67
31/08/2000	Credit Suisse	Hold	+4.67	4.67	+3.53	+3.29
04/09/2000	Banca Leonardo	Market Perform	-1.27	1.27	-1.97	-0.74
07/09/2000	Banca Leonardo	Outperform	0.00	0.00	-0.53	+2.62
	Credit Suisse	Hold				
08/09/2000	Chase	Buy	+2.26	2.26	+3.46	-0.44
11/09/2000	Intermonte	Neutral	-3.24	3.24	-3.36	-1.91
15/09/2000	Credit Suisse	Hold	-2.02	2.02	-0.95	-0.20
25/10/2000	Centrosim	Market Perform	-5.28	5.28	-5.08	+5.28
15/11/2000	Credit Suisse	Hold	+1.42	1.42	+0.64	+4.23
16/11/2000	Euromobiliare	Sell	-2.14	2.14	-1.47	-3.03
	Intermonte	Neutral				
28/11/2000	Banca IMI	Buy	-3.14	3.14	-2.43	-7.64
05/12/2000	Intermonte	Underperform	-1.40	1.40	-2.98	-15.28

Table 12 Panel B. ABSs, ARs and CARs

Date	Broker	Recommendation	R_Tis (%)	ABS (%)	AR %	CAR %
09/01/2001	Albertini	Reduce	+5.20	5.20	+5.14	+16.46
	Credit Suisse	Hold				
	Euromobiliare	Reduce				
	Merrill Lynch	Neutral				
11/01/2001	Cheuvreux	Outperform	+7.02	7.02	+5.69	+19.77
	Intermonte	Underperform				
23/01/2001	Banca IMI	Buy	+5.79	5.79	-5.27	+4.99
26/01/2001	Banca Leonardo	Hold	-1.89	1.89	-1.77	-2.54
13/02/2001	Merrill Lynch	Neutral	+0.36	0.36	+0.95	-0.51
15/02/2001	Credit Suisse	Hold	-3.54	3.54	-4.05	-19.04
	Julius Bar	Reduce				
	Merrill Lynch	Neutral				
16/02/2001	Euromobiliare	Sell	-13.23	13.23	-11.47	-18.38
	Intermonte	Sell				
	Merrill Lynch	Neutral				
28/02/2001	Nomura	Sell	-3.03	3.03	-3.03	-7.75
21/03/2001	Julius Bar	Reduce	-5.45	5.45	-4.41	-2.26
29/03/2001	Intermonte	Sell	0.00	0.00	-1.53	-2.55
	Merrill Lynch	Neutral				
12/04/2001	Julius Bar	Reduce	-0.13	0.13	-0.59	-3.02
17/04/2001	Banca IMI	Buy	-1.95	1.95	-2.23	-0.05
	Merrill Lynch	Neutral				
04/05/2001	Credit Suisse	Hold	-0.73	0.73	-1.02	-1.93
15/05/2001	BNP Paribas	Neutral	+1.22	1.22	+1.79	-0.45
17/05/2001	Euromobiliare	Sell	-0.34	0.34	-0.28	-3.51
	Banca IMI	Buy				
18/05/2001	Credit Suisse	Hold	-2.55	2.55	-2.87	-1.22
21/05/2001	Merrill Lynch	Neutral	+1.11	1.11	+1.93	+1.20
12/06/2001	BNP Paribas	Neutral	-4.57	4.57	-3.44	-7.11
05/07/2001	Merrill Lynch	Neutral	-4.37	4.37	-4.36	-4.65
12/07/2001	BNP Paribas	Neutral	+3.68	3.68	+3.69	-1.61
31/07/2001	BNP Paribas	Neutral	+4.87	4.87	+4.64	+16.65
	Schroder	Neutral				
02/08/2001	BNP Paribas	Neutral	+9.12	9.12	+9.54	+19.63
06/08/2001	Merrill Lynch	Reduce	-1.69	1.69	-2.54	-5.63
16/08/2001	Merrill Lynch	Reduce	-5.44	5.44	-4.51	-9.04
21/08/2001	BNP Paribas	Neutral	+9.03	9.03	+8.94	+7.00
23/08/2001	BNP Paribas	Neutral	-3.24	3.24	-3.44	-5.40
30/08/2001	BNP Paribas	Neutral	-6.06	6.06	-4.17	+0.14
	Banca IMI	Hold				
31/08/2001	Caboto	Hold	0.00	0.00	+0.49	-5.35
	Euromobiliare	Reduce				
	Intermonte	Underperform				
	Merrill Lynch	Reduce				
03/09/2001	Cheuvreux	Underperform	-2.67	2.67	-1.67	+0.16
06/09/2001	WestLB Panmure	Underperform	-7.50	7.50	-4.92	-7.78
24/09/2001	BNP Paribas	Neutral	+6.16	6.16	-0.67	-1.45
18/10/2001	BNP Paribas	Neutral	-1.18	1.18	-0.54	-0.04
29/10/2001	Santander	Underperform	+2.72	2.72	+4.22	+0.98
12/11/2001	Cheuvreux	Underperform	-3.25	3.25	-0.72	-0.23
14/11/2001	Julius Bar	Reduce	+4.41	4.41	+4.14	+8.80
15/11/2001	Credit Suisse	Hold	+2.40	2.40	+1.64	+5.53
	Banca IMI	Hold				
10/12/2001	Rasfin	Reduce	-0.64	0.64	+1.15	-0.01
20/12/2001	Fortis	Buy	-4.25	4.25	-3.11	-3.69

5 Conclusion

The main objective of the paper is to identify how behavioral biases affected analysts, distorting their valuation of internet companies during the dot.com bubble, through a clinical study of Tiscali, the most emblematic Italian internet company at the time.

Three analysis have been carried off: the first regarding the three regularities characterizing the IPO process (hot issue markets, initial underpricing, long-run underperformance), the second performing a content analysis of the reports covering the main acquisitions of telecom and IPS companies, and, finally, the third one consisting in an event study measuring the market reaction to recommendation changes and to the deals announcements.

The first analysis has underlined the presence of all three phenomena. Tiscali went public in the hottest market for internet companies in the entire history of financial markets, it recorded an initial underpricing of 55% and the long-run performance was definitely poor.

The content analysis, instead, showed a generalized excessive optimism among analysts, both due to potential conflicts of interest and behavioral biases. Analysts affiliated to the investment banks that served as Tiscali's advisors kept issuing positive recommendations when it was quite clear, at least analysts working for other brokers, that the company's perspectives were definitely not good at all. While, more in general, the uncertainty surrounding internet companies real value was definitely high at the time, also behavioral biases like excessive optimism and overconfidence distorted analysts' valuations as well as decision heuristics such as anchoring.

Right around the bubble peak, analyst tended to use only relative valuation, first using multiples based on companies' fundamentals, then the number of subscribers or of pages viewed to determine their value. These methods proved to be erroneous. This was particularly the case in respect of those "new" multipliers that did not take the companies' fundamentals to find their value, but were based on potential growth perspectives. More in general, as the behavioral finance literature has pointed out, these methods can be classified as valuation heuristics, often based on intuition rather than on rigorous scientific methods, like the Discounted Cash Flows approach. Intuition is important, but often leads to mistakes, and the analysts' reports demonstrated in the bubble period, when they dramatically overestimate the real value of internet companies.

After the bubble burst, in 2001, analysts started using DCF again, but often together with market multiples, thus not eliminating the behavioral traps of these latter methods.

Finally, the results found applying the event study analysis demonstrates that investors behaved irrationally, influenced by the general euphoria on the

internet sector, and not basing their investment decisions on companies' fundamentals. Analyzing the market reaction to the issuance of recommendations following Tiscali's acquisitions announcements, it seems that analysts did not convey value to investors. This could be explained by the fact that the market could have finally understood that analysts were overly optimistic in their valuations.

The case of Tiscali serves for more general considerations. This clinical study has underlined the importance of considering the psychological biases affecting analysts' valuations. Analysts need insert in their toolbox the new instruments provided by behavioral finance to avoid the traps of certain (not scientifically based) techniques. Also, it is important to understand the cognitive and emotional aspects affecting the behavior of individual investors.

Without this understanding, financial markets' behavior will remain a black box for those who still think that the traditional approach is enough.

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