

# “Underpricing and Expected Returns for Individual and Institutional Investors: the Case of Italy”

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# Underpricing and Expected Returns for Individual and Institutional Investors: the Case of Italy<sup>1</sup>

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## Abstract

This paper analyses the initial returns of Italian IPOs made during the 1995-2001 period in order to calculate the initial profitability of both retail investors and institutional investors who subscribe all the initial public offers and sell them on the first listing day. We point out that although initial returns are significantly positive, after taking into account rationing and application costs, the expected profits of retail investors are not significantly different from the risk-free rate of return. Furthermore, expected returns for institutional investors are significantly higher than the risk-free rate of return.

**JEL classification:** G30, G32

**Key words:** Underpricing, Expected returns, Initial public offers.

## 1. Introduction

Literature on economics and finance has shown that, in different countries and during different periods, the strategy of subscribing initial public offerings and selling them on the first listing day brings on average positive returns. For a summary of empirical evidence on initial returns in international markets see Chowdhry and Sherman (1996), Loughran et al. (1994) and, more recently, the review paper by Ritter and Welch (2002).

There are several theoretical explanations for this “anomaly” known as underpricing. The most frequent hypothesis is the existence of asymmetric information between the different players involved in IPOs.

Rock (1986) provided one of the first few explanations for underpricing. His theory of the *winner's curse* brightly explains this behaviour by assuming the existence of asymmetric information between different investor categories. Other models assume the exchange of asymmetric information between the more informed issuers and investors. As a result of these contributions, high quality issuers wish to distinguish themselves from low quality issuers by selling their shares at a lower price than the market evaluation (Welch, 1989). Jegadeesh et al. (1993) first introduces “the market feedback hypothesis” by following the assumption of investors being more informed than issuers. By selling underpriced shares, former post-initial returns are then informative for the optimal investment level (Chemmanur, 1993).

Another research stream is based on symmetric information assumptions (Ritter and Welch, 2002). Hughes and Thakor (1992) argue that underpricing is a way to protect issuers from lawsuits. Other theories suggest that in some cases underwriters could not justify a higher offer price given the already high evaluations. Furthermore, Boehmer and Fische (2002), noting that the greater the underpricing is, the higher the trading volume is, suggest that an underwriter gains additional trading revenues by underpricing issues.

The allocation process to market IPOs is assumed to be a powerful factor for explaining underpricing (Ritter and Welch, 2002). The IPO marketing method broadly used around the world and generally associated with high underpricing levels, has been carried out by considering only a limited number of information from investors (Chowdhry and Sherman, 1996). However, since

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more accurate pricing drives better investment choices, the entrepreneur would like an evaluation mechanism as accurate as possible (Sherman and Titman, 2002). Furthermore, Ritter (1984) suggests that high informational differences between issuers and investors lead to high underpricing.

The book-building process increases the information exchange level between issuers and investors. However, this method has often been the object of criticism, since underwriters generally exclude retail investors from the bidding process (Sherman and Titman, 2002), and favour institutional investors. Additionally, Ljungqvist and Wilhelm (2002) suggest that, since bankers and institutional investors maintain long-term relationships, the former may favour the latter during the allocation process.

Therefore, underpricing and the discrimination between institutional and retail investors are two of the most studied IPO research topics. However, underpricing does not always coincide with the investor's expected initial return. Where the IPO demand exceeds the offer, investors will be rationed (partial share allocation), and only a fraction of the subscribing investors will receive shares. The share demand to offer ratio is known as oversubscription. Thus, underpricing overestimates the expected return of investors: the latter weights underpricing based on the probability to receive new issues.

Several works have found that expected returns of IPOs are not significantly different from the risk-free rate of return. For example, Koh and Walter (1989) and Lee et al. (1996) have confirmed this course on IPOs in Singapore. On this stock market exchange the rationing process is unbiased: all investors who apply for the same number of shares have an equal chance to receive them. In particular, Lee et al. (1996) analyse 132 IPOs during the 1973-1992 period. They verify that though the average underpricing level is higher than 30%, initial expected returns for retail investors are not significantly different from the risk-free rate in the period between the subscription and the first listing day. This analysis also takes into account transaction costs.

Regarding the British experience, Levis (1990) analyses 123 IPOs made on the London Stock Exchange (LSE) and on the Unlisted Securities Market (USM) in the 1985-1988 period. The average underpricing is 8.6%, whereas the expected returns are not significantly different from zero after considering mechanisms of cash settlement of the LSE and probabilities to receive subscribed shares. Levis concludes by saying that "the average underpricing of new issues is probably just sufficient to entice investors to participate in the new issues market".

This paper analyses the initial returns of Italian IPOs made during the 1995-2001<sup>1</sup> period on the *Mercato Principale* and the *Nuovo Mercato*. In particular, this paper considers the expected returns for retail investors and institutional investors. The results are surprising: in both the *Mercato Principale* and the *Nuovo Mercato*, after considering rationing and transaction costs, the expected returns for retail investors are null, whereas the average underpricing is ranged between 12.8% and 21.7%. On the other hand, expected returns for institutional investors are significantly higher than the risk-free rate of return: though the average underpricing of both the investor categories is the same, generally oversubscription is higher for uninformed investors (9.53 versus 6.89). This work calculates the expected returns by using two different methodologies: the equal-weighted approach and the weighted approach. The former is generally used in literature: the basic assumption is that investors allocate the same quantity of money in each subscription. In the Italian case this assumption holds for neither retail investors nor institutional investors since IPOs require different investments for subscription. The weighted approach overcomes this limitation, by considering exactly the quantity of money received by each IPO.

This article is organised as follows. In section 2 we describe the allocation mechanisms used in Italian IPOs, the methodologies to calculate underpricing, and the expected initial returns for retail and institutional investors. Section 3 reports a sample of Italian IPOs and the outcomes of the strategy used to subscribe all Italian IPOs during the 1995-2001 period. Finally, section 4 concludes by summarising the main findings.

<sup>1</sup> See Pagano et al. (1998) and Cassia et al. (2004). For a summary of Italian IPOs also see Fabrizio (1998), Giorgino et al. (2001) and Giudici and Paleari (2002).

## 2. The IPO Process in Italy, the Definition of Underpricing, and the Expected Initial Returns

Since 1994, the offer price of Italian IPOs has been determined by using the procedure known as book building. The banker that coordinates the IPO (global coordinator) chooses a price range for investors, and then starts the booking procedure. Initial public offerings usually last three days. In most Italian IPOs, the selected offer price is within the initial price range. In several cases the offer price is a limit value in this range.

The global coordinator also decides a minimum quantity of shares for public investors and a maximum amount of shares for special investor categories, such as employees, customers, residents, etc. The residual amount of shares is reserved to national and international institutional investors.

A public investor can only bid for a multiple of a minimum quantity of shares, known as minimum lot, up to a maximum quantity, fixed by the global coordinator. Conversely, offers from institutional investors are not limited by quantity.

The allocation of shares is usually discretionary only for institutional investors, whereas Consob<sup>1</sup> set allocation rules for public investors. In particular, beginning from 1998, though this allocation process has been even-handed, in most oversubscription cases where offers have been oversubscribed only the minimum lot rather than the bid quantity has been allocated to public investors. Therefore, retail investors almost always receive just the minimum quantity. Up to 1998, the rationing allocation process had followed the first-come first-served criterion. Allocation rules determine the probability for public investors to receive shares.

Since 1998 this probability has been the supply to demand ratio, which is the opposite of oversubscription. Despite this particular share allocation mechanism, supply and demand calculations consider the number of investors rather than the quantity of shares. In other words, though an investor can bid for a quantity higher than the minimum lot, he will receive at best the minimum quantity in case of oversubscribed IPOs.

Up to 1998 the probability to receive shares had depended on the time within the offer period in which investors subscribed new issues. In this case, the supply to demand ratio is just approximately close to the probability to receive shares because this is not easy to measure. However, in order to complete this empirical analysis and despite this limitation, we will use this ratio also for IPOs made before 1998.

Analytically, let  $T_{off}$  be the number of offered shares and let  $L_{min}$  be the minimum quantity or minimum lot, the maximum number of satisfied investors may be expressed as follows:

$$N_{\max} = \frac{T_{off}}{L_{\min}}. \quad (1)$$

Let  $N$  be the number of investors subscribing the IPO; there are two possible cases:

a)  $N \leq N_{\max}$

In this case the probability,  $p$ , to receive at least the minimum quantity is equal to 1.

b)  $N > N_{\max}$

In this case, the probability,  $p$ , to receive the minimum quantity is equal to  $\frac{N_{\max}}{N}$

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<sup>1</sup> Consob is a governmental authority which has to be informed in advance of the offering conditions, and has to certify that the issuer provides adequate information to the public.

When an investor requires the minimum quantity, demand may be written as  $\bar{D} = NL_{\min}$ . Thus:

$$\frac{N_{\max}}{N} = \frac{T_{\text{off}}}{L_{\min}} \frac{L_{\min}}{D} = \frac{T_{\text{off}}}{D}. \quad (2)$$

Only in this case, may the probability to receive shares be expressed as the ratio between the number of offered shares and the number of subscribed shares. The latter ratio does not generally represent the inverse of oversubscription.

In our empirical analysis, if the number of subscribers is higher than the maximum number of satisfied investors, the latter will coincide with the number of investors who receive the minimum quantity of shares.

The rationing process for institutional investors is completely different. It is not even-handed but, rather, arbitrary. The issuer decides which institutional investors will receive shares. The quantity of shares allocated to each informed investor is also discretionary. In this case, even though it is not appropriate, a measure of probability to receive shares is used in order to compare the expected returns of informed and uninformed investors. Since there are no limits to the number of allocated shares, the ratio between the number of offered shares and the number of subscribed shares to institutional investors is taken into account as a proxy for this probability (inverse of oversubscription).

For each of the IPOs the following measures of initial returns are computed:

- 1) the underpricing, defined as the difference between the price of on the first listing day and the offer price divided by the offer price. It measures the average return for investors who receive shares during the IPOs, and sell them on the first listing day;
- 2) the expected initial return, defined as the weighted average between two different returns. The first amount is the return of investors under the hypothesis of receiving shares during the subscription period and selling them on the first listing day. The second represents the return from the risk-free issue in the period between payment of the shares obtained during the subscription and their sale on the first listing day. Weights are the probability  $p_i$  of receiving new shares and its complement  $1-p_i$  respectively. The former probability, as seen above, is equal to 1 when demand is less than or equal to supply, whereas it represents the supply to demand ratio in the case of oversubscription for institutional investors. For retail investors that probability is equal to the offered number of minimum lots to the number of subscribing investors ratio.

Two measures of expected returns are taken into consideration. The first is based on the assumption that each investment in IPOs requires the same amount of money, and it is obtained by simply calculating the expected returns average. This measure is also called equal-weighted expected return.

Analytically, let  $r_i$  be the expected return for company  $i$ , as seen above. The equal-weighted expected return  $r$  may be calculated as follows:

$$r = \frac{\sum_{i=1}^N r_i}{T} \quad \text{where } T \text{ represents the number of firms taken into consideration.}$$

In reality, investments in IPOs require the subscription of different quantities of money. For retail investors, when there are any oversubscribed issues, the quantity received is at best the minimum quantity.

At this point we are going to assume that subscribers always invest the minimum quantity in each IPO. The measure of weighted expected returns is then defined as follows:

$$r = \frac{\sum_{i=1}^N (n_i P_i) r_i}{\sum_{i=1}^N (n_i P_i)}, \quad (3)$$

where  $n_i$  is the minimum quantity and  $P_i$  is the subscription price for company  $i$ . The denominator of the latter expression represents the total capital investors need to achieve the strategy of subscribing each of the IPOs and selling them on the first listing day.

If the capital required to invest into company  $i$  ( $n_i P_i$ ) is the same for each company, the expression simply becomes the expected returns average.

For institutional investors, the weighted expected returns are calculated by considering the shares allocated to this category of investors. The weighted expected return may be calculated from the expression above by reinterpreting  $n_i$  as the number of shares offered to institutional investors.

The sale price applied by retail investors takes into consideration the transaction costs paid by investors when selling shares on the secondary market.

### 3. A Sample of IPOs and the Results of Our Empirical Analysis

In our empirical analysis, we consider 134 initial public offerings (IPOs) during the 1995-2001 period on the two most important Italian stock markets, the Mercato Principale and the Nuovo Mercato. The latter opened in June 1999, and it is the market for small and medium firms operating in high-tech sectors or with expected high growth rates. Table 1 illustrates the distribution of IPOs during the 1995-2001 period for each year on both Italian stock markets. We observe that in the last few years there have been a large number of new issues and IPOs: in particular, during 2000, there were 50 new issues and 42 of them were IPOs.

Table 1

The number of new issues and IPOs on both the Mercato Principale and the Nuovo Mercato during 1995-2001

|              | Mercato Principale |           | Nuovo Mercato |           | Total      |            |
|--------------|--------------------|-----------|---------------|-----------|------------|------------|
| Year         | New Issues         | IPOs      | New Issues    | IPOs      | New Issues | IPOs       |
| 1995         | 14                 | 11        |               |           | 14         | <b>11</b>  |
| 1996         | 14                 | 12        |               |           | 14         | <b>12</b>  |
| 1997         | 13                 | 10        |               |           | 13         | <b>10</b>  |
| 1998         | 25                 | 15        |               |           | 25         | <b>15</b>  |
| 1999         | 31                 | 21        | 6             | 6         | 37         | <b>27</b>  |
| 2000         | 16                 | 12        | 34            | 30        | 50         | <b>42</b>  |
| 2001         | 13                 | 13        | 5             | 4         | 18         | <b>17</b>  |
| <b>Total</b> | <b>126</b>         | <b>94</b> | <b>45</b>     | <b>40</b> | <b>171</b> | <b>134</b> |

We think it is especially important to highlight a few descriptive IPO characteristics of analysed in this paper. In particular, Table 2 shows some features of the new issues listed on both the Mercato Principale and the Nuovo Mercato. Median values are more significant than average values since outliers are not considered. There are clear age and size differences between firms quoted on the Mercato Principale and those quoted on the Nuovo Mercato. Whereas the median age of the former group is 30 years, the median age of the latter is less than 10 years. The median

turnover values of the year before listing are 117 and 22 million Euro respectively. There are no significant differences in the pre-listing leverage whose median value is slightly higher than 1.

Offer prices are strongly different between the two markets. The theoretical capitalisation, obtained by multiplying the offer price and the number of shares after the IPO, is equal to 1.3 times the turnover, 7.7 times the EBITDA and 9.6 times the EBIT for the Mercato Principale. For the Nuovo Mercato these values are 4.2, 17.4, and 16 respectively. By referring to equity values, the median offer price is 3.9 times the pre-offer book value for the Mercato Principale, whereas this coefficient is 17.3 for the Nuovo Mercato. This difference decreases when the latter ratio is computed by considering the post-offer book value, which takes into account the new equity emitted during the IPO. This reduction is due to 'the new equity capital to total post-offer equity capital ratio' for the Nuovo Mercato being over 80%.

Table 2

Descriptive statistics of the sample of IPOs for the two main Italian stock markets

| New Issues 1995-2001       | Mercato Principale |         |                   | Nuovo Mercato |        |                   |
|----------------------------|--------------------|---------|-------------------|---------------|--------|-------------------|
|                            | Average            | Median  | No. of companies* | Average       | Median | No. of companies* |
| Listing Age (year)         | 46.2               | 30.0    | 93                | 9.9           | 8.0    | 39                |
| Year Turnover -1 (k€)      | 822,296            | 116,755 | 80                | 64,884        | 22,418 | 39                |
| Leverage -1                | 1.54               | 1.07    | 75                | 2.08          | 1.03   | 36                |
| Market cap. /Turnover -1   | 2.64               | 1.30    | 67                | 87.27         | 4.20   | 36                |
| Market cap. /EBITDA -1     | 1.81               | 7.70    | 66                | -481.84       | 17.37  | 39                |
| Market cap. /EBIT -1       | 8.28               | 9.62    | 66                | -1,090.45     | 15.96  | 39                |
| $P_{off}/BookValue_{pre}$  | 6.15               | 3.91    | 75                | 49.82         | 17.32  | 39                |
| $P_{off}/BookValue_{post}$ | 3.06               | 2.58    | 76                | 3.63          | 3.57   | 39                |
| %OPS / $BookValue_{post}$  | 42.9%              | 46.7%   | 93                | 81.55%        | 84.18% | 39                |

The year 0 is the listing year. Thus, turnover, EBIT, EBITDA and leverage of the year -1 come taken from the balance sheets of the year before the listing.

The pre-offer market capitalisation is defined as the offer price multiplied by the pre-offer number of shares. The post-offer market capitalisation is obtained by considering the total post-offer number of shares.

The leverage is defined as the financial debts to equity capital ratio.

It was not possible to estimate the leverage of the following companies since information on them is not available: Dada, Freedom and TAS.

The market capitalisation to turnover ratio for the Nuovo Mercato is not calculated for E.Biscom, Gandalf and Freedomland, since their turnover was equal to zero the year before the listing.

$BookValue_{pre}$  represents the pre-offer book value and  $BookValue_{post}$  represents the post-offer book value.

\* Number of companies for which information is available.

Table 3 reports the statistics on underpricing: though the average value of the 134 IPOs is 15.46%, there is a considerable difference between the Mercato Principale (12.81%) and the Nuovo Mercato (21.70%). It is important to point out that median values are systematically lower than the average values: this is due to the presence of several outliers. For example, regarding the Mercato Principale in 1999 the average underpricing is 32.92%, whereas the median underpricing is only 1.03%: in this case the outlier is Finmatica, underpriced by 532.6%.

Table 3

Underpricing for the period of 1995-2001 on both the Mercato Principale and the Nuovo Mercato

|                    | Year      | No. of IPOs | Underpricing |        |                    |             |               |     |
|--------------------|-----------|-------------|--------------|--------|--------------------|-------------|---------------|-----|
|                    |           |             | Average      | Median | Standard Deviation | T-statistic | T-probability |     |
| Mercato Principale | 1995      | 11          | 7.85%        | 8.30%  | 6.62%              | 3.93        | 0.00          | *** |
|                    | 1996      | 12          | 10.47%       | 4.31%  | 17.92%             | 2.02        | 0.07          | *   |
|                    | 1997      | 10          | 11.18%       | 10.35% | 11.14%             | 3.17        | 0.01          | **  |
|                    | 1998      | 15          | 9.37%        | 4.45%  | 15.26%             | 2.38        | 0.03          | **  |
|                    | 1999      | 21          | 32.92%       | 1.03%  | 115.84%            | 1.30        | 0.21          |     |
|                    | 2000      | 12          | 4.34%        | 2.69%  | 10.73%             | 1.40        | 0.19          |     |
|                    | 2001      | 13          | -0.28%       | -1.00% | 5.39%              | -0.19       | 0.85          |     |
|                    | Total     | 94          | 12.81%       | 3.08%  | 55.89%             | 2.22        | 0.03          | **  |
| Nuovo Mercato      | 1999      | 6           | 40.15%       | 23.57% | 45.30%             | 2.17        | 0.08          | *   |
|                    | 2000      | 30          | 20.75%       | -0.18% | 43.96%             | 2.59        | 0.02          | **  |
|                    | 2001      | 4           | 1.15%        | 0.49%  | 1.84%              | 1.25        | 0.30          |     |
|                    | Total     | 40          | 21.70%       | 2.40%  | 42.38%             | 3.24        | 0.00          | *** |
| Total              | 1995-1997 | 33          | 9.81%        | 7.00%  | 12.69%             | 4.44        | 0.00          | *** |
|                    | 1998-2001 | 101         | 17.31%       | 0.93%  | 59.68%             | 2.91        | 0.00          | *** |
|                    | Total     | 134         | 15.46%       | 3.08%  | 52.22%             | 3.43        | 0.00          | *** |

The last column indicates the level of statistical significance: \* statistically different from zero at the 90% level, \*\* statistically different from zero at the 95% level, \*\*\* statistically different from zero at the 99% level.

Table 4

Oversubscription for retail and institutional investors during the period of 1995-2001 on both the Mercato Principale and the Nuovo Mercato

|                    | Year      | Number of | Oversubscription for retail investors |        |          | Oversubscription for institutional investors |        |          |
|--------------------|-----------|-----------|---------------------------------------|--------|----------|----------------------------------------------|--------|----------|
|                    |           |           | Average                               | Median | Standard | Average                                      | Median | Standard |
| Mercato Principale | 1995      | 11        | 2.41 **                               | 2.38   | 1.50     | 2.41 **                                      | 2.38   | 1.50     |
|                    | 1996      | 12        | 6.18 *                                | 2.89   | 8.46     | 7.02 **                                      | 3.89   | 7.01     |
|                    | 1997      | 10        | 5.68 **                               | 3.97   | 5.68     | 8.39 ***                                     | 6.32   | 6.73     |
|                    | 1998      | 15        | 12.87 ***                             | 7.29   | 12.62    | 5.70 **                                      | 3.06   | 8.05     |
|                    | 1999      | 21        | 11.00 *                               | 4.48   | 22.23    | 6.64 ***                                     | 3.42   | 8.26     |
|                    | 2000      | 12        | 2.58 **                               | 1.89   | 2.08     | 5.41 ***                                     | 4.48   | 4.28     |
|                    | 2001      | 13        | 1.19                                  | 1.00   | 0.39     | 2.90 **                                      | 1.85   | 2.94     |
|                    | Total     | 94        | 6.68 ***                              | 2.59   | 12.71    | 5.56 ***                                     | 3.04   | 6.46     |
| Nuovo Mercato      | 1999      | 6         | 22.94 ***                             | 20.67  | 12.26    | 20.45                                        | 10.88  | 27.91    |
|                    | 2000      | 30        | 16.92                                 | 3.33   | 55.38    | 9.05 ***                                     | 6.16   | 10.11    |
|                    | 2001      | 4         | 1.00                                  | 1.00   | -        | 1.66 *                                       | 1.51   | 0.45     |
|                    | Total     | 40        | 16.23 *                               | 4.05   | 48.28    | 10.02 ***                                    | 4.25   | 14.16    |
| Total              | 1995-1997 | 33        | 4.77 ***                              | 2.54   | 6.11     | 5.90 ***                                     | 3.24   | 6.08     |
|                    | 1998-2001 | 101       | 11.09 ***                             | 2.84   | 11.46    | 7.21 ***                                     | 3.42   | 5.19     |
|                    | Total     | 134       | 9.53 ***                              | 2.75   | 28.56    | 6.89 ***                                     | 3.33   | 9.60     |

\* statistically different from zero at the 90% level, \*\* statistically different from zero at the 95% level, \*\*\* statistically different from zero at the 99% level.



Table 4 highlights oversubscription for both retail and institutional investors. In the period between 1995 and 2001, the average oversubscription value for institutional investors, 6.89, is lower than the relative value for retail investors, 9.53. The standard deviation is also lower for institutional investors.

Let  $\mu_i$  indicate the value of underpricing, and  $p_i$  the probability for public investors to obtain the subscribed shares. The probability of not receiving shares in an oversubscription situation is equal to  $1-p_i$ . In this case, investors may alternatively obtain the risk-free rate of return,  $r_f$ , for a period usually lasting three days between payment of the shares obtained during the subscription and their sale during the first listing day. Let  $c$  be the transaction cost calculated as a percentage of the value of shares on the first listing day, the return decreases from  $\mu_i$ , to  $\mu_i - c$ .

The equation employed for computing expected returns is the following:

$$r_i = (\mu_i - c)p_i + r_f(1 - p_i). \quad (4)$$

This outcome is then compared with the return obtained in absence of subscription, i.e., the risk-free rate of return  $r_f$ .

Since the return  $r_f$  calculated in a period of three days is less than 0.06%, assuming that the risk-free rate of return has been between 2.5% and 6%, we decided not to consider this effect. The transaction costs<sup>1</sup> are considered to be equal to 1% for the period of 1995-1998 and 0.6% for the period of 1999-2001 for retail investors whereas they are around 0.05% for institutional investors.

For retail investors the probability of obtaining shares, the demand to supply ratio, are calculated by considering the number of investors rather than the number of shares, as indicated in section 2. This ratio represents the right probability to receive shares within the period of 1998-2001 since before then, as one can see above, only the timing of subscription did matter.

On the other hand, this probability for institutional investors is computed by taking into account the number of shares, since the limitation on the minimum quantity to subscribe does not hold for this class of investors.

Tables 5 and 6 highlight the expected returns for retail and institutional investors respectively. Regarding retail investors, with the exception of 1995, the expected returns are not significantly different from the risk-free rate of return. In particular, the results of 101 IPOs from 1998 to 2001 point out an expected average initial return of 0.63%.

One would also reach the same conclusions by subdividing the sample for each year and by distinguishing between the Mercato Principale and the Nuovo Mercato. There is also a huge difference between underpricing and expected initial returns.

Weighted expected returns are often lower than equal-weighted returns. This may imply that issues with higher expected returns have lower capitalisation.

As regards institutional investors, the expected returns are often significantly different from zero. In particular, the statistics for the periods of 1995-1997, 1998-2001, and 1995-2001 are positive at a significance level over 95%.

Hence, despite high underpricing values, only institutional investors seem to have positive gains from investments in IPOs.

<sup>1</sup> Two kinds of transaction costs are considered: fixed costs, due to any financial transaction, and variable costs, computed as a percentage of the capital required to subscribe new issues. Before 1998, the former cost had been approximately 0.3% (divided by the mean capital required to subscribe the minimum lot) and the latter 0.7% for retail investors. Since 1998, they became 0.2% and 0.4% respectively. Regarding institutional investors, fixed costs do not generally occur whereas variable costs are approximately 0.05% of the capital required to subscribe new issues.

Table 5

Expected Returns (equal-weighted and weighted) for retail investors in the period of 1995-2001 on both the Mercato Principale and the Nuovo Mercato

|                    | Year             | Number of  | Equal Weighted Expected Returns |             |               | Weighted Expected Returns |             |               |
|--------------------|------------------|------------|---------------------------------|-------------|---------------|---------------------------|-------------|---------------|
|                    |                  |            | Average                         | T-statistic | T-probability | Average                   | T-statistic | T-probability |
| Mercato Principale | 1995             | 11         | 2.70%                           | 2.32        | 0.04 **       | 2.32%                     | 2.23        | 0.05 *        |
|                    | 1996             | 12         | 0.12%                           | 0.15        | 0.88          | -0.07%                    | -0.08       | 0.94          |
|                    | 1997             | 10         | 2.04%                           | 0.94        | 0.37          | 1.50%                     | 0.86        | 0.41          |
|                    | 1998             | 15         | -0.72%                          | -1.21       | 0.25          | -0.72%                    | -1.23       | 0.24          |
|                    | 1999             | 21         | -0.89%                          | -1.49       | 0.15          | -0.70%                    | -1.55       | 0.14          |
|                    | 2000             | 12         | -0.64%                          | -0.35       | 0.73          | -0.49%                    | -0.25       | 0.81          |
|                    | 2001             | 13         | -1.02%                          | -0.70       | 0.50          | -0.80%                    | -0.54       | 0.60          |
|                    | <b>Total</b>     | <b>94</b>  | <b>0.01%</b>                    | <b>0.02</b> | <b>0.98</b>   | <b>0.02%</b>              | <b>0.06</b> | <b>0.96</b>   |
| Nuovo Mercato      | 1999             | 6          | 0.49%                           | 1.23        | 0.27          | 0.60%                     | 1.22        | 0.28          |
|                    | 2000             | 30         | 2.83%                           | 1.38        | 0.18          | 1.86%                     | 1.16        | 0.26          |
|                    | 2001             | 4          | 0.55%                           | 0.60        | 0.59          | 0.46%                     | 0.52        | 0.64          |
|                    | <b>Total</b>     | <b>40</b>  | <b>2.25%</b>                    | <b>1.46</b> | <b>0.15</b>   | <b>1.48%</b>              | <b>0.52</b> | <b>0.20</b>   |
| Total              | <b>1995-1997</b> | 33         | 1.56%                           | 1.91        | 0.07 *        | 1.33%                     | 1.85        | 0.07 *        |
|                    | <b>1998-2001</b> | 101        | 0.39%                           | 0.56        | 0.58          | 0.05%                     | 0.10        | 0.92          |
|                    | <b>Total</b>     | <b>134</b> | <b>0.68%</b>                    | <b>1.20</b> | <b>0.23</b>   | <b>0.39%</b>              | <b>0.92</b> | <b>0.36</b>   |

The second part of the "T-probability" column indicates the level of statistical significance: \* statistically different from zero at the 90% level, \*\* statistically different from zero at the 95% level, \*\*\* statistically different from zero at the 99% level.

Table 6

Expected Returns (equal-weighted and weighted) for institutional investors in the period of 1995-2001 on both the Mercato Principale and the Nuovo Mercato

|                    | Year             | Number of  | Equal Weighted Expected Returns |             |                 | Weighted Expected Returns |             |                 |
|--------------------|------------------|------------|---------------------------------|-------------|-----------------|---------------------------|-------------|-----------------|
|                    |                  |            | Average                         | T-statistic | T-probability   | Average                   | T-statistic | T-probability   |
| Mercato Principale | 1995             | 11         | 3.65%                           | 3.14        | 0.01 **         | 0.37%                     | 2.52        | 0.03 **         |
|                    | 1996             | 12         | 0.64%                           | 1.16        | 0.27            | 1.23%                     | 1.27        | 0.23            |
|                    | 1997             | 10         | 1.25%                           | 1.80        | 0.10            | 1.90%                     | 1.89        | 0.09 *          |
|                    | 1998             | 15         | 1.38%                           | 1.29        | 0.22            | 0.90%                     | 0.75        | 0.47            |
|                    | 1999             | 21         | 1.19%                           | 1.20        | 0.25            | 0.45%                     | 2.11        | 0.05 **         |
|                    | 2000             | 12         | -0.41%                          | -0.40       | 0.70            | 1.04%                     | 1.16        | 0.27            |
|                    | 2001             | 13         | -1.10%                          | -2.16       | 0.05 *          | 0.06%                     | 0.15        | 0.88            |
|                    | <b>Total</b>     | <b>94</b>  | <b>0.92%</b>                    | <b>2.46</b> | <b>0.02 **</b>  | <b>0.53%</b>              | <b>3.20</b> | <b>0.00 ***</b> |
| Nuovo Mercato      | 1999             | 6          | 4.94%                           | 2.94        | 0.03 **         | 3.80%                     | 2.72        | 0.04 **         |
|                    | 2000             | 30         | 3.41%                           | 2.06        | 0.05 **         | 3.03%                     | 1.52        | 0.14            |
|                    | 2001             | 4          | 0.63%                           | 1.08        | 0.36            | 1.05%                     | 1.08        | 0.36            |
|                    | <b>Total</b>     | <b>40</b>  | <b>3.36%</b>                    | <b>2.64</b> | <b>0.01 **</b>  | <b>3.03%</b>              | <b>1.08</b> | <b>0.11</b>     |
| Total              | <b>1995-1997</b> | 33         | 1.83%                           | 3.50        | 0.00 ***        | 0.86%                     | 2.71        | 0.01 **         |
|                    | <b>1998-2001</b> | 101        | 1.59%                           | 2.65        | 0.01 ***        | 1.01%                     | 2.34        | 0.02 **         |
|                    | <b>Total</b>     | <b>134</b> | <b>1.65%</b>                    | <b>3.52</b> | <b>0.00 ***</b> | <b>0.99%</b>              | <b>2.72</b> | <b>0.01 ***</b> |

The second part of the "T-probability" column indicates the level of statistical significance: \* statistically different from zero at the 90% level, \*\* statistically different from zero at the 95% level, \*\*\* statistically different from zero at the 99% level.

Our findings are consistent when using both the equal-weighted portfolio approach, in which investors subscribe the same amount of money in each IPO, and the weighted approach, which considers the real investment required to shareholders.

#### 4. Concluding Remarks

This paper tries to evaluate the expected return from the strategy of subscribing IPOs, and selling them on the first listing day. Since in most IPOs the demand of shares exceeds the offer, investors may not receive the subscribed issues. In this case, the IPO is oversubscribed and investors are rationed. As a result, the payout of investors who subscribe all IPOs and sell them on the first listing day does not coincide with the average underpricing. The latter would be the right initial return for public investors only in case IPOs were undersubscribed.

Our empirical evaluation of expected returns requires information on the levels of demand and supply for all IPOs and on the process of rationing.

Since 1998, Italy has adopted the rationing system for retail investors through an unbiased process. Each selected investor receives only the minimum quantity of shares and not his subscribed quantity. Therefore, when oversubscription occurs each investor receives the same number of shares. Each investor has also the same probability to be selected and this probability depends on neither the number of subscribed shares nor on the timing of the subscription within the offer-period.

The results of our empirical analysis highlight that, despite the existence of significant levels of underpricing, the expected returns for retail investors who subscribe all IPOs and sell them on the first listing day, are not significantly different from zero. This strategy is a zero sum game since IPOs, which have higher underpricing on average and also have higher levels of oversubscription. This result is confirmed for each year in both the Mercato Principale and the Nuovo Mercato.

When evaluating the case of institutional investors, whose process of rationing is not even-handed, the results are quite different. Expected returns for this group of investors are statistically higher than the risk-free rate of return in most years and by considering both the Mercato Principale and the Nuovo Mercato. Even though there are several theories explaining this anomaly, a short lock-in period for institutional investors subscribing IPOs may be introduced to avoid any opportunistic strategies.

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