LUISS 🏛

Department of Business and Management

Chair of Advanced Corporate Finance

The impact of the underwriter reputation and the private investments on the underpricing and the underperformance phenomena in the Italian IPO market

Prof. Raffaele Oriani

———————————————
SUPERVISOR

Prof. Pierluigi Murro

———————————————
CO-SUPERVISOR

Giorgio Ferrari
713241

———————————————
CANDIDATE

Academic Year 2019/2020

Table of Contents

1. Introduction

One of the most important moments for a firm is the decision to go public through an Initial Public Offering (IPO). All the larger and most influent companies have passes through this moment, and also part of the medium-size companies. This decision is mainly due to two different causes, the need to raise money and the interest by one or more owners to exit, but in both cases there is a divergence in the interests of the two parties involved, the issuing firm and the new investors. While the firm aims to maximize the amount of money raised with the offering, both in the interest of the firm itself and in the interest of the exiting owners, the investors' priority is to maximize their own return buying at the lower possible price the shares of the newly issued firm. However, this divergence exists only in the very short-run, while the longer the investment horizon the more aligned the interests of the issuer and of the investors to increase the firm value are. The initial difference in the point of view of these two parties is the explanation of the underpricing, the phenomenon according to which the newly issued firms have an increase in the stock price during the first trading day with respect to the offer price. On one hand, the firm would like to set a high price to gather as much money as possible, but on the other hand it has to compensate the investors for the risk deriving from the investment reducing the offer price. In the period following the flotations, however, even if the interests of the firm and of the investors are aligned, it is not always the case that the stock price has a good performance, especially in the first three years after the IPO. It was found out that the newly issued firms tend to underperform with respect to the market and with respect to a portfolio of similar listed companies. This is usually explained by the concurrence of the IPO with periods of extremely good performance of the firm, which might not be sustained in the following periods, and by the window-dressing of the financials, both actions taken in order to maximize the amount of money raised with the flotation. Once the performance comes back to its natural level, since the stock price is a reflection of the expected future performance of the company, also the share price is resized. The most influential studies about the underpricing and the underperformance phenomenon are related to the American stock market, with Ibbotson[1] and Ritter[2] as the pioneers of the researches regarding underpricing and Loughran and Ritter[3] as the most influential authors about underperformance.

The factors that have an impact on the level of underpricing are all related to the riskiness of the issuing firm. Since the reason why the underpricing phenomenon exists is to compensate the investors for the risk they are bearing investing in that specific offering, it is straightforward that the higher the riskiness of the issuer the higher the degree of underpricing. While it is important to focus on the firm-specific characteristics in order to asses the level of risk of a company, it is important to remember that during an extraordinary transaction such as an IPO there are also external parties which can assess the riskiness of the firm. The most important one is the underwriter, the investment bank which subscribes the offering and manages together

---

[1]Ibbotson, R.G., 1975, *"Price performance of common stock new issues"*
[2] Ritter, J.R., 1984, *"The "Hot Issue" Market of 1980"*
[3] Loughran, T., and Ritter, J.R., 1995, *"The New Issue Puzzle"*

with the issuer the process. In the unfortunate case in which your car has some problems, you prefer to go to the workshop where you know a lot of cars have been successfully repaired, and not to the one where few or no cars have been repaired. Similarly, while deciding in which offering invest in, people use the reputation of the bank which is underwriting the flotation as a signal of the riskiness of the issuer and of the IPO in general. The higher the reputation of the underwriter, the lower the risk. This because since the banks repeatedly perform the role of underwriter the most prestigious ones have no incentive in subscribing risky offering nor in "cheating" in the price setting. In fact, as explained by Beatty and Ritter[4], the incentive to overprice or underprice too much would be detrimental for the following offerings underwritten and, moreover, there is a higher probability that the low risk firms would in the future collect money in the market through a seasoned offering, as explained by Welch[5]'s signalling theory, usually adopting as underwriter the same bank which underwrote the IPO, meaning a higher compensation for it. A further factor that has an impact on the degree of underpricing is the presence among the pre-IPO owners of private investment firms. They have a role similar to the one of the underwriter in the eyes of the investors, since similarly to the banks they have a reputational stake at risk in the offering. This "certification role", proven by Barry et al.[6], Megginson and Weiss[7] and Levis[8], is the main explanation of the impact that their mere presence has on the underpricing phenomenon, which appears to be lower for the PE-backed companies with respect to the non-backed ones.

For what regards the underperformance of the newly issued firms, also in this case the underwriter reputation and the presence of private equity firms among the pre-offering owners has an impact on the long-run stock performance of the companies. However, in the underperformance case the impact of the underwriter reputation is not due to the certification role but to the ability of the more prestigious banks to reduce the window-dressing of the financials and the earnings management, as shown by Chang et al.[9], and the reduction of the valuation biases of the investors, as explained by Dong et al.[10]. The impact of the private equity investments, on the other hand, is a matter of the earnings quality, higher for the PE-backed firms according to Katz[11], and of the firm-specific characteristics of these companies, which are usually larger, more mature and with better performances as shown by Levis[12].

However, these researches mainly focus on the American market, while only few researches are focussed on the European markets. Among them, a really small fraction is dedicated to the Italian IPO market, which has been analysed only partially. In fact, while there are studies related to the last century and the really first years of this century about the underpricing and the underperformance of the Italian IPOs and the impact of the PE-backing on them, there is no research about more recent offerings and the effect that the underwriter

[4] Beatty, R.P., and Ritter, J.R., 1986, *"Investment Banking, Reputation, and the Underpricing of Initial Public Offerings"*
[5] Welch, I., 1989, *"Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings"*
[6] Barry, C.B., Muscarella, C.J., Peavy III, J.W., and Vetsuypens, M.R., 1990, *"The role of venture capital in the creation of public companies"*
[7] Megginson, W.L., and Weiss, K.A., 1991, *"Venture Capitalist Certification in Initial Public Offerings"*
[8] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*
[9] Chang, S.C., Chung, T.Y., and Lin, W.C., 2010, *"Underwriter reputation, earnings management and the long-run performance of initial public offerings"*
[10] Dong, M., Michel, J.S., and Pandes, J.A., 2011, *"Underwriter Quality and Long-Run IPO Performance"*
[11] Katz, S.P., 2009, *"Earnings Quality and Ownership Structure: The Role of Private Equity Sponsors"*
[12] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*

reputation has on these phenomenon. For this reason, this thesis is focussed on testing whether in the years between 2001 and 2016 the Private Equity investments and the underwriter reputation have impacted the level of underpricing and the three-years stock price performance of the Italian IPOs.

To do so, a dataset composed of offerings that happened in the time-period previously mentioned in Italy is formed and analysed. The study is conducted analysing through two one sample T-tests to see whether the underpricing and the underperformance phenomenon are present in the dataset, and then through different two samples T-tests to see whether the PE-backing and the underwriter reputation have an impact on the two phenomenon. Subsequently, different regressions are performed to control for the explanatory variables and for the control variables selected, among which the sector. A part of the regressions is with interaction variables in order to test the impact that the two main variables, the PE-backing and the underwriter reputation, have on each single explanatory variable.

The aim of this study is to fill the space left blank in the literature about the effect of the underwriter reputation on underpricing and underperformance of the Italian IPOs and to extend the studies related to these two phenomena to the most recent years.

2. Literature Review

The academic literature related to the IPO processes and performances is vast. Scholars started to study them in the beginning of the second half of the 20th century and are still arguing about them nowadays. The two main branches of studies are the ones related to the initial overperformance, known as underpricing, and the long-run underperformance of the newly issued stocks, which are the objects of the analysis of this work.

2.1 The underpricing effect

Previous authors found a pattern in the short-run performance of the newly issued stocks: they tend to perform exceptionally well in the period subsequent to the beginning of the shares trade. This phenomenon, known as underpricing, has as its most known scholars Ibbotson and Ritter, two of the earliest authors to analyse it. They studied underpricing between the end of the 1970s and the beginning of the 1980s, and many following studies were based on their works. While the work by Ibbotson[13] was of particular interest with respect to the strong evidence provided about underpricing in the 1960s, the one by Ritter[14] was important for the evaluation methodology used. According to it, to estimate the level of underpricing it is used the percentage change between the first closing price and the offer price. While there is an alternative method, to calculate the total amount of "money left on the table" subtracting to the total value of the shares at the first closing date after the beginning of the share trade the total value of the shares evaluated with the offer price, the one by Ritter is still the most used nowadays. The main difference between these two methods is the subject who is interested in the level of underpricing. While the percentage change is a measure of the returns made through the investment, and so is crucial from the point of view of both the investors and the issuing firm, the amount of money left on the table is an important variable only for the issuing firm, interested in maximizing the amount of money collected in the market.

However, as suggested by Ljungqvist[15], there are two main adjustments needed to these evaluation methods according to the Country in which the IPO took place: the first one depends on the daily-volatility limits set by the Stock Exchange and the second one is related to the delays between the pricing and the trading periods. For what regards the former, while it is usually almost uninfluential to choose a one-week time window for the calculation of the underpricing instead of one day, in presence of limits to the daily volatility, imposed by the interested Stock Exchange, the one-day evaluation may not consider the whole phenomenon, leading to an underestimation of the underpricing level. The latter, on the other hand, affects the underpricing calculation since, as the time span between the pricing and the beginning of the trade period increases, the market movements during this time window would impact in a stronger way the differences between the offering and the closing price. For this reason, the underpricing level should be adjusted for the interim market

---

[13] Ibbotson, R.G., 1975, *"Price performance of common stock new issues"*
[14] Ritter, J.R., 1984, *"The "Hot Issue" Market of 1980"*
[15] Ljungqvist, A., 2007, *"IPO Underpricing"*

performance. The academic literature focussed not only on the evaluation part of the underpricing phenomenon, but mainly on trying to understand why it occurs, both from the point of view of the issuing firms and the one of the underwriters. Considering the advanced level of maturity achieved by the literature about this topic there are several theories developed to explain it, and all of them may be summarized in four broader categories according to Ljungqvist[16]: asymmetric information models, institutional explanations, ownership and control theories, and behavioural explanations.

2.1.1 Asymmetric information models

The first group analysed is the most discussed one. These models take into consideration the three main actors of the IPO process, the issuing firm, the underwriter and the investors, and the information they have about the firm to explain the reasons behind underpricing. The most known theory among these is probably the "winner's course", developed by Rock[17]. It states that there is a "course" for the uninformed investors, those who bid indiscriminately, since they receive the full amount of shares desired only in the unattractive bids, the ones expected to have a fair offer price, because of the interest of the informed investors, who gathered costly information about the offerings, to be rewarded for the costs incurred through a discount in the initial price. Like this, in the attractive bids the shares sold to the uninformed investors are rationed because of the presence of the informed investors, who create an excess in the demand of the shares and reduce the possible gains for the other investors, while in the unattractive ones they receive the whole amount of shares, which give no or few returns. To prevent them, who are the larger part of the investors, to exit the market, it is needed to reduce the offer price and grant them some first-day returns in the form of underpricing, since the informed investors alone are not enough to take up all the offered shares.

Rock's focus was on the reasons behind this phenomenon, but his theory did not regard the level of underpricing. It was thanks to Beatty and Ritter[18] that an extension to the "winner's course" theory in the quantitative direction was made. They argued that the degree of expected underpricing is positively related to the ex-ante uncertainty about the real value of the shares. Considering the problem enlightened by Rock, the idea behind it is quite straightforward: as uncertainty about the real share value increase, more investors are willing to incur costs to gain information, and more informed investors means less shares available to uninformed investors, intensifying the "winner's course" problem. Thus, as ex-ante uncertainty increases, the uninformed investors demand a higher degree of expected underpricing.

Rock's "winner's course" led to a change in the pricing mechanism, moving from the strict pro-rata allocation rule typical of Rock's study to the bookbuilding process. While in the former the price and the quantity of the outstanding shares are set by the issuing firm and the underwriter, and the investors submit a

---

[16] Ljungqvist, A., 2007, *"IPO Underpricing"*
[17] Rock, K., 1985, *"Why New Issues are Underpriced"*
[18] Beatty, R.P., and Ritter, J.R., 1986, *"Investment Banking, Reputation, and the Underpricing of Initial Public Offerings"*

bid to buy them, the latter mechanism allows the underwriter to collect information about the informed investors' perceived share price in exchange of special attention to them in the allocation of shares. This process, when suitably adopted, allows the underwriter to reduce the information asymmetry and, consequently, also the "winner's course". However, since the information revealed were costly, a certain degree of underpricing is requested by the informed investors to reveal their information, explaining why also with the bookbuilding mechanism this phenomenon exists. Notwithstanding, as shown by Benveniste and Spindt[19] and by Benveniste and Wilhelm[20], the underpricing required under bookbuilding is generally lower with respect to the one observed with the pro-rata allocation rule. A deviation from this theory arises in case of regulatory constraints on the allocation of shares, whose reduce the underwriter's possibility to reward the informed investors who disclosed their information, reducing their willingness to do so.

A different theory to explain the underpricing phenomenon is the signaling one, a type of model in which the information asymmetry is between the issuing firm and the investors. According to Allen and Faulhaber[21] and Welch[22], the issuing firms use underpricing to show their quality. They consider a situation in which there are two issuing firm, one high quality and one low quality indistinguishable in the eyes of the investors, interested in collecting money in the market twice, the first time through the IPO and the second one through a seasoned offering. Underpricing is used in the initial public offering, using Ibbotson[23]'s words, to "leave a good taste in investors' mouths". The idea behind it is to initially leave some money on the table to maximize the capital raised in the second offering, but it is only possible for the high-quality firms which can bear the initial loss. So, even if the low-quality firm should have interests into mimic the actions of the high-quality one, the imitation costs, the high risk of being detected as a low-quality firm before the seasoned offering and the consequent losses in both the offerings prevent them from "cheating", resulting in having a lower degree of underpricing with respect to the high-quality firm.

2.1.2 Institutional explanations

The second branch of theories analysed is the one related to institutional factors. Before talking about them, it must be pointed out that, since the larger part of academic literature about underpricing is linked to the U.S., the institutional factors studied are mainly pertinent to the American legislation, while may not be relevant to other Countries. One theory, strictly linked to the U.S., is the "legal insurance" hypothesis. Since litigation costs regarding IPOs are high for the underwriter, that may be sued for misstatement or omission of information in the prospectus, both in direct legal fees and in reputational cost, Tinic[24] ,Hughes and Thakor[25],

[19] Benveniste, L.M., and Spindt, P.A., 1989, *"How investment bankers determine the office price and allocation of new issues"*
[20] Benveniste, L.M., and Wilhelm, W.J., 1990, *"A comparative analysis of IPO proceeds under alternative regulatory environments"*
[21] Allen, F., and Faulhaber, R., 1989, *"Signaling by underpricing in the IPO market"*
[22] Welch, I., 1989, *"Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings"*
[23] Ibbotson, R.G., 1975, *"Price performance of common stock new issues"*
[24] Tinic, S.M., 1988, *"Anatomy of initial public offerings of common stock"*
[25] Hughes, P.J., and Thakor, A.V., 1992, *"Litigation risk, intermediation, and the underpricing of initial public offerings"*

and Hensler[26] argue that underpricing is used as insurance from such litigations, from which derives the hypothesis name. The idea is that the probability of being sued increases in the offer price, and so reducing it intentionally they try to avoid a litigation or, in the extreme case, the probability of an adverse ruling in case of trial. As previously mentioned, this theory is mainly related to the U.S because of its high number of litigations. In fact, in other countries is extremely rare to be sued for an IPO, and so it is not possible to consider the "legal insurance" hypothesis as a primary driver of underpricing in other nations.

Underpricing is also an advantage when considering taxes. The first evidence of such hypothesis has been shown by Rydqvist[27], who studied the short-term post-offering performance of the Swedish IPOs from 1980 to 1994. He found that in the 1980s the average underpricing was 41%, while from 1990 to 1994 it was only 8%. This because of two laws, one which changed the categorization of underpricing returns from capital gains to ordinary income, taxed more heavily, and the other to limit the amount of shares purchasable by the underwriter, reducing its interest in setting a high degree of underpricing. However, how it is possible to see by Rydqvist's data, the elimination of tax benefits did not remove the underpricing phenomenon, but only diminished it, demonstrating that this was not the main reason explaining it. A different study about the same argument was performed by Taranto[28], who analysed the United States and, more in particular, the relation between IPO-related employee stock options and taxation. He argued that, since the taxes paid on such options are paid in two different tranches of which the first one, on the difference between the strike price and the offer price, is considered as income tax and the second, on the difference between the offer price and the secondary market sell value of the share, as capital gain, and so deferred and at a lower rate with respect to income taxes, the owners of these stock options are interested in reducing the offer price as much as possible. However, such in the previous case, tax benefits are only an incentive to further increase the degree of underpricing, and so cannot explain alone the existence of such phenomenon. It has to be pointed out that this theory is applicable to every jurisdiction in which underpricing is taxed at a lower rate with respect to personal income and not only in the United States.

In 1993, Ruud[29] developed a totally different theory regarding the underpricing causes. She argued that the first-day returns were biased due to the price stabilization actions perpetrated by the underwriters. In particular, she concentrated her work on the left-hand tail of the returns' distribution, almost inexistent, and on the successive price fall of part of the stocks which had zero returns during the first trading day. Thus, according to her "price stabilization" theory, the returns observed in the market are conditional upon the underwriters' intervention in the aftermarket. However, Benveniste *et al.*[30] shown that price stabilization actions do not create underpricing, but instead reduce its level. Since the investment banks' fees increase in the gross proceeds, they would increase as much as possible the offering price, reducing the interest of the

---

[26] Hensler, D.A., 1995, *"Litigation costs and the underpricing of initial public offerings"*
[27] Rydqvist, K., 1997, *"IPO underpricing as tax-efficient compensation"*
[28] Taranto, M., 2003, *"Employee stock options and the underpricing of initial public offerings"*
[29] Ruud, J.S., 1993, *"Underwriter price support and the IPO underpricing puzzle"*
[30] Benveniste, L.M., Busaba, W.Y., and Wilhelm Jr., W.J., 1996, *"Price stabilization as a bonding mechanism in new equity issues"*

clever investors in participating in the bookbuilding process without a "counterforce" which reduce the underwriters' interest in overpricing. This counterforce is the commitment to stabilize the price through a quasi-put option, written by the investment bank and held by the investors. Such a mechanism eliminates the possibility to participate in an intentionally overpriced offering, also decreasing the investors' request of underpricing since they cannot have negative returns.

2.1.3 Ownership and control theories

A further explanation for the underpricing phenomenon is related to the relationship between ownership and control. The theories belonging to this category tend to explain underpricing as a tool used by the directors to manage the ownership of the firm after the offering. According to Brennan and Franks[31], who studied the ownership structure of the issuing firms both in the pre and in the post-IPO period in the UK, the costs of underpricing borne by the directors is only 0.77% of their pre-IPO ownership, meaning that they generally tend to maintain intact their holding. They argue that the reason behind this decision is their willingness to maintain control of their benefits as directors, and underpricing is used in order to achieve this goal. The reasoning is quite simple. A lower offering price increases the interest of the investors in the offering, incrementing the number of bids and leading to an oversubscription. In such a situation, the pro-rata allocation rule they use in their work reduces the number of shares received by each investor proportionally in order to maintain intact the ratio of share ownership of the bids, reducing the possibility of a single investor to become a blockholder. Dispersing the ownership, the directors achieve two different goals: they reduce the interest of the new owners to monitor the actions of the directors, for which reason this theory is denominated "reduced monitoring hypothesis", and they diminish the risk of an hostile takeover.

On the other hand, it may be argued that monitoring is a value-maximizing concept, and that the managers and the directors might lose from the previous theory in case their stake is large enough that, in case the share price declines in the aftermarket, their private benefits are offset by the lower value of their stock. Following this reasoning, Stoughton and Zechner[32] consider underpricing as a tool to incentivize a large investor to become a blockholder and to invest in monitoring. Since monitoring is costly and is performed only if profitable to the large investor, or in other words if his stock is large enough, the issuer uses underpricing to maximize the number of shares owned by the stockholder. However, this is only possible if bookbuilding, or a similar allocation mechanism in which the underwriter can distribute the shares as he prefers, is used. In case of a pro-rata allocation rule, in fact, we would end up in the same reasoning of Brennan and Franks[33], which theory would not work in an environment different from the one they analysed.

---

[31] Brennan, M.J., and Franks, J., 1997, *"Underpricing, ownership and control in initial public offerings of equity securities in the U.K"*
[32] Stoughton, N.M., and Zechner, J., 1998, *"IPO mechanisms, monitoring and ownership structure"*
[33] Brennan, M.J., and Franks, J., 1997, *"Underpricing, ownership and control in initial public offerings of equity securities in the U.K"*

2.1.4 Behavioural explanations

The theories analysed until now are based on the idea that investors are rational. The branch of literature that has to be discussed now, on the other hand, does not take into consideration this assumption, but tries to explain underpricing through the analysis of the behaviour of the parties involved, not always rational. In a sequential sale IPO, an offering in which the investment decisions of the participants are not taken simultaneously, with limited information circulation, the actions of the earlier investors impact the later bidders. This is Welch's[34] "informational cascade" theory, according to which an overpriced issue may be successful while an underpriced one may fail. This may happen because of the not-so-rational behaviour of the later investors, who tend to be strongly influenced by the initial trend of the sales despite the information in their possession. They suppose the early bidders have positive information in case of successful sales and negative information in situations in which the sales are disappointing, bidding consequently. This behaviour leads to two possible outcomes, depending on the early investors: the IPO rapidly succeed or rapidly fail. Knowing this, the early participants have the power to demand for higher returns in terms of underpricing in exchange of the commitment in the IPO to create a positive "cascade". This theory has 3 drawbacks. In the first instance, it can only explain the different degrees of underpricing but not its existence. Moreover, in case of freely communications among the investors the "cascade" would not form since the later bidder can confront the information in their possess with that of the early participants. Last but not least, this theory is valid only in a sequential sale IPO, meaning that with the bookbuilding method, with which the underwriter can maintain secrecy over the information disclosed by the investors, there would be no need to increase the level of underpricing to ensure the early bidders' commitment.

A further investors' behavioural bias which might influence the degree of underpricing is the existence of investor sentiment towards an IPO. The participants who act accordingly to it are called "sentiment investors", a different type of investors with respect to the one considered until now, the "rationale" investors. To explain the existence of underpricing in their presence, Ljungqvist *et al.*[35] created a model based on the inventory holding of shares. To exploit them, who are going to buy shares only if the price is increasing in the aftermarket, the issuing firm would retain stock to prevent the falling of the stock value and subsequently sell the stored shares to the sentiment investors. This would extract the maximum from the valuation surplus that this type of investor can provide. However, the presence of constraints about inventory holding does not permit to directly apply this strategy. Instead, the issuing firm has to involve the institutional investors, that are used as external inventories and as intermediaries between the issuer and the sentiment investors. On the other hand, to bear the risk of a price decline before the selling of these shares, the institutional investors require a certain degree of underpricing sufficient to break even in expected terms.

---

[34] Welch, I., 1992, *"Sequential Sales, Learning, and Cascades"*
[35] Ljungqvist, A., Nanda, V., and Singh, R., 2006, *"Hot markets, investor sentiment, and IPO pricing"*

The behavioural bias can also occur at the issuing firm level. Loughran and Ritter[36] argue that the issuer's decision-maker, if retaining a part of the shares, tends not to worry about leaving money on the table since this loss is overwhelmed by the first-day returns. So, the higher the degree of underpricing expected, the less interested is in the initial wealth loss. The expectation of increase in price can be predicted, according to Hanley[37], through the "partial adjustment" that occurs in the revision of the offer price during the bookbuilding process. According to him, the offerings in which a positive revision of the initial reference price occurs tend to have higher initial returns with respect to negative revision IPOs. In this situation, if the decision-maker perceived gain from the initial returns on his holding are larger than the perceived decrease in wealth due to underpricing, since the shares could have been sold at a higher price, he is satisfied with the IPO performance, explain why underpricing is tolerated by the issuer.

2.2 The role of Underwriters and Ownership Structure in the Underpricing effect

2.2.1 Underwriter reputation and the offer price

Through the IPO process, the issuer wants to maximize the wealth collection setting the offer price as high as possible, keeping in the meanwhile the highest possible level of investors' interest. It is however difficult for them, who have an incentive to "cheat" in the price determination, to gain the investors trust without an external party that certificates the reliability of the offer price. This actor is the underwriter. As previously mentioned, it has a central role in setting the price and selling the shares, actions which impact the success of the offering. Considering its importance in the process and the competitiveness of the investment banking market, the issuing firms face an important dilemma when deciding which bank to appoint as underwriter. In the end, the main solution to it is to hire the best possible investment bank. How do they do so? Basing their consideration on the underwriter reputation. This is feasible because, unlikely the issuing firms which face an offering generally once, the banks perform the role of underwriter several times, each time for a different client, building up a reputation. Some investment banks have a reputation of accepting only low-risk offerings, the ones in which the issuers are considered high-quality firms, others have to accept also higher risk firms to survive in the market. Recalling the "signalling theory" previously analysed, every issuer would like to appear as a low-risk firm to maximize the price and thus the money collection hiring underwriters with high reputation. However, these high-quality banks do not consider the higher risk firms as appetible because of several reasons, linked to the price and, considering that in every offering the investors require a return for bearing the risk, to the underpricing phenomenon.

First of all, there is the theory developed by Beatty and Ritter[38] regarding the relation between underwriter reputation, offer price and underpricing. Considering their model about the positive relation

[36] Loughran, T., and Ritter, J.R., 2002, *"Why Don't Issuers Get Upset about Leaving Money on the Table in IPOs?"*
[37] Hanley, K.W., 1993, *"The underpricing of initial public offerings and the partial adjustment phenomenon"*
[38] Beatty, R.P., and Ritter, J.R., 1986, *"Investment Banking, Reputation, and the Underpricing of Initial Public Offerings"*

between underpricing and ex-ante expectation, analysed in the previous section, the investment banks' proceeds-related fees, their inability to exactly predict the firms' true value, and the banks' non-salvageable reputational stake at risk in case of mispricing, reputation on which they can earn future profits, they developed the idea according to which "cheating", either underpricing too much or too few, would lead to a loss for the underwriters. This because in case of overpricing the investment banks would lose value in the eyes of the investors, no more participating in the offerings underwritten by them, and in case of excessive underpricing the issuing firms would consider an offering with that underwriter as a sure loss of money, not hiring them in the future. In either case, the reputational loss would lead to a monetary loss for the underwriter.

As argued before, the investment banks' reputation differs between one another, but there is not only one way to determine if an underwriter is prestigious or not. The first reputational evaluation model is the use of the tombstone announcements as an estimation of the prestigiousness of an underwriter. This model, developed by Carter and Manaster[39], compares the position in each tombstone announcement, the listing of a pending public security offering in which the underwriting syndicate are listed in order of prestigiousness, creating a rank of all the underwriters' reputations. A different way to evaluate the level of prestige of an investment bank is, according to Megginson and Weiss[40], to calculate the percentage of the total amount of money brought by the underwriter to the market in the analysed period. The higher this percentage, the more prestigious the underwriter is. Megginson and Weiss[41], who analysed the period following Carter and Manaster[42]'s one, found that the two models have a high, positive correlation, meaning that they can be interchanged and have similar results.

The different levels of prestigiousness lead to different degrees of underpricing. Considering the "winner's course" theory, according to which the informed investors are those who requires more underpricing because of the costs of gathering information and this kind of investors prefer the high-risk offerings from which they can extract higher returns, the negative correlation between underwriter reputation and offerings riskiness, and the issuers' willingness to maximize the price signalling their low-level of risk, Carter and Manaster[43] found that the offerings underwritten by prestigious banks have a lower degree of underpricing. This result has been confirmed through the years by different studies, however Beatty and Welch[44] found a positive correlation between underwriter reputation and underpricing in the period between 1992 and 1994. In any case, their conclusion was that the different result was due to a change in the economic environment, since performing the same test on previous time periods resulted in a negative correlation between investment banks' prestigious and underpricing. An explanation for this relation considering the underwriters' point of view is their interest in increasing the present value of subsequent offerings, as argued by Welch[45]. In fact, there is a

---

[39] Carter, R.B., and Manaster, S., 1990, *"Initial Public Offerings and Underwriter Reputation"*
[40] Megginson, W.L., and Weiss, K.A., 1991, *"Venture Capitalist Certification in Initial Public Offerings"*
[41] Megginson, W.L., and Weiss, K.A., 1991, *"Venture Capitalist Certification in Initial Public Offerings"*
[42] Carter, R.B., and Manaster, S., 1990, *"Initial Public Offerings and Underwriter Reputation"*
[43] Carter, R.B., and Manaster, S., 1990, *"Initial Public Offerings and Underwriter Reputation"*
[44] Beatty, R.P., and Welch, I., 1996, *"Issuer Expenses and Legal Liability in Initial Public Offerings"*
[45] Welch, I., 1989, *"Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings"*

higher probability that a low-risk firm would collect money in the market through seasoned offerings, and setting a higher price during the IPO would grant the position of leading underwriter also for the subsequent offerings. For these reasons, and for the reluctancy of switching from a prestigious underwriter in case of following offerings, Carter[46] argues that the IPOs underpricing decreases with the prestigiousness of the investment banks involved and with the riskiness of the initial public offering, in accordance with the previous literature.

2.2.2 Underwriter reputation and Underpricing hypothesis

Part of the scope of this work is to analyse the effect of the above-mentioned theories about the relation between underwriters' prestigiousness and underpricing in the Italian IPO market. In order to do that, I will initially control for the existence of the underpricing phenomenon in the sample and then, in a second moment, for the negative correlation between underwriter reputation and degree of underpricing.

$H_{1,1}$: Underpricing exists in the Italian IPO market
$H_{0,1}$: Underpricing does not exists in the Italian IPO market

$H_{1,2}$: Underpricing is less severe for offerings with more prestigious underwriters
$H_{0,2}$: Underpricing is more severe for offerings with more prestigious underwriters

2.2.3 The impact of Private Equity investments on the Underpricing effect

While considering the riskiness of a company, an external party has to gather information about its accountings and its future prospects. As previously explained, a third party which can certificate the status of the interested firm is important to ensure the reliability of the disclosed information, especially in case of an extraordinary transaction such as an IPO. Up to now the only certifier analysed was the underwriter, nonetheless it is not the only one. The presence of a private equity investor such as a venture capitalist or a buy-out firm has the same function and the same negative effect on the degree of underpricing as the underwriter. The difference lies in the percentage of offerings they appear in and in their role; while the underwriter is present in every IPO and helps in the price setting procedure, the private equity firms take part to just a fraction of the flotations and can mainly affect its timing. However, differently from the underwriters which affect the underpricing level through their reputation, the mere presence of venture capitals and buy-out companies is enough to have an impact on the first-day returns thanks to the positive reaction by the market to their pre-IPO ownership. The

---

[46] Carter, R.B., 1992, *"Underwriter Reputation and Repetitive Public Offerings"*

literature about the two private investment bodies has been done separately through the years and in such a way they will be analysed in this dissertation, starting from the venture capitals.

The VC-related certification hypothesis has been proved by Barry *et al.*[47] and by Megginson and Weiss[48], and the idea behind their theories is the same as the one related to the underwriter reputation. If the certifier has a reputational stake at risk in case of mispricing, the future monetary loss from a decline in the reputation is higher than the gains from overpricing the current offering and it is costly to hire the certifying third party for the issuer, we are in front of a reliable certifier. And this is the situation with the venture capitals. However even among the VC-backed IPOs there were differences, especially when comparing the first-day returns of the firms backed by small and large venture capitals. An interesting pattern found by *Barry et al.*[49], and successively explained with the Grandstanding theory by Gompers[50], is the tendency by young VCs to bring the companies in the capital market earlier in term of the issuers' life span than the older and more prestigious venture capitals. This decision, led by the desire to build up a reputation and to quickly raise money for new funds, increases the riskiness of their flotations and, subsequently, the underpricing required by the market to participate in the offering.

On the other hand, the literature regarding the BO-backed offerings is fragmented over time. It started in the early 1990s with studies about the long-run performance of Reverse Leveraged Buyouts (RLBOs), companies returning public after a buyout and a subsequent period of private ownership, and then stopped until the last years of the 2000s, when studies about the relationship between the private equities' holdings and the degree of underpricing in the IPOs started to appear. Cao and Lerner[51] found that the RLBOs are less underpriced than the other offerings, with their returns almost half of the other IPOs, but it is with Levis[52] that the analysis of the whole category of BO-backed firms began. Comparing the first-day returns of all the flotations of companies in which a buy-out firm had controlling interests with the other IPOs, he found that the former had less underpricing. In addition to the certification hypothesis, which is extendible to the BOs, the general explanation for the lower degree of underpricing of both RLBOs and BO-backed offerings is the advanced stage of maturity of the firms in which the private equity funds invest. The older the company, the less risky it is, reducing the required underpricing. Furthermore, it is demonstrated by Katz[53] that the PE-backed companies have superior earnings quality and less tendency to use earnings management in the five years previous to the offerings, factors that can explain the different level of underpricing with respect to the other flotations.

Even if for both VC and BO the IPO is seen as an exit strategy and their first-day returns are lower with respect to non-backed offerings, comparing the two private equity bodies some differences arise which

[47] Barry, C.B., Muscarella, C.J., Peavy III, J.W., and Vetsuypens, M.R., 1990, *"The role of venture capital in the creation of public companies"*
[48] Megginson, W.L., and Weiss, K.A., 1991, *"Venture Capitalist Certification in Initial Public Offerings"*
[49] Barry, C.B., Muscarella, C.J., Peavy III, J.W., and Vetsuypens, M.R., 1990, *"The role of venture capital in the creation of public companies"*
[50] Gompers, P.A., 1996, *"Grandstanding in the venture capital industry"*
[51] Cao, J., and Lerner, J., 2009, *"The performance of reverse leveraged buyouts"*
[52] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*
[53] Katz, S.P., 2009, *"Earnings Quality and Ownership Structure: The Role of Private Equity Sponsors"*

lead to different degrees of underpricing between them, as shown by Levis[54]. In fact, the BO-backed offerings are less underpriced than the VC-backed ones, which on the other hand have lower returns during the first trading day than the non-backed flotations. This discrepancy is essentially due to the differences in their investments. While the venture capitals invest in new, small start-ups, with only few of them able to reach an advanced stage, and their investments have a life span of five-to-ten years, the buy-out companies invest in mature firms and manage them for 10-12 years, until they decide to harvest the investment. As previously mentioned, age is strictly related to the riskiness of the company, explaining the different levels of underpricing between the two of them.

2.2.4 Private Investments and Underpricing hypothesis

Considering the previous researches regarding the effect of private equity bodies backing on the first-day returns, in this work I will analyse whether also in the Italian IPO market the firms with private investments have less underpricing with respect to non-backed companies. The lack of data about the different types of private equity firms, Buy-Out and Venture Capital, which invested in the interested companies partially limits the research, which can only focus on the PE-backed firms as a whole.

$H_{1,3}$: PE-backed IPOs have less underpricing than non-backed offerings

$H_{0,3}$: PE-backed IPOs have no different level of underpricing than non-backed offerings

2.3 The Long-Run Underperformance of IPOs

For a public company, the main goal is to maximize the shareholder value through dividends and high share value. In order to achieve this objective, it is important to maximize the firm performance and continuedly monitor some value drivers that affect the shares valuation, such as the Weighted Average Cost of Capital (WACC), taxes, sales growth and operating margin. However, even if all the public firms focus on these drivers, the performance of newly issued stocks, as shown by Ritter[55] and Loughran and Ritter[56] among others, is worse than the non-issuing firms' one during the first years of trading. This trend is visible since the very first year and lasts for four years, while during the fifth one, as reported by Ibbotson[57], the difference in share performance between newly issued and non-issuing firms is not significant.

The Long-Run performance of IPOs stocks can be measured in different ways, but in general just two methods are used. The first one is to conduct an event study calculating the 3-year buy-and-hold returns of the interested firms, taking their average and comparing it with a benchmark, being it a single form or a portfolio.

---

[54] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*
[55] Ritter, J.R., 1991, *"The Long-Run Performance of Initial Public Offerings"*
[56] Loughran, T., and Ritter, J.R., 1995, *"The New Issue Puzzle"*
[57] Ibbotson, R.G., 1975, *"Price Performance of Common Stock New Issues"*

The second methodology is to run a multi-factor time-series regression about the monthly excess returns of a rolling portfolio comprehensive of all the firms that went public during the previous 36 months. It is a rolling portfolio since every month the newly issued firms would be added to the portfolio and the stocks issued 37 months before or delisted would be removed from it. However, the average abnormal returns calculated with the time-series regression are lower with respect to the ones measured with the event study, as shown by Loughran and Ritter[58]. They found two main explanations for it. On one hand, they argued that, in case of time-depending misevaluations, usually junk-bond issuance, equity-financed acquisitions, equity issues and share repurchases, the time-series regressions, which weights equally each month, would be affected differently with respect to the event study. On the other hand, while the buy-and-hold portfolios' benchmark is constructed in a way such that it does not comprehend IPOs, the time-series regression's benchmark is partly formed by IPOs, reducing the difference between the two groups.

One of the possible causes for the underperformance phenomenon to happen is the decline in operating performance following an offering, event described by Jain and Kini[59]. This driver, estimated through the operating cash flow deflated by assets and the operating return on assets, shows a decreasing trend after IPOs even if its main components, sales and capital expenditures, continued to grow in a larger way with respect to non-issuing firms. This contraction is also inconsistent with the initially high Price Earning (PE) ratio, sign of expectation of Earnings Per Share (EPS) growth in the future. However, this ratio starts to decrease in the aftermarket. In addition, also the EPS tend to decrease over time, showing that the generally high investors' expectations are not sustained. This effect may derive from three different causes, which might occur one by one or all together. One possibility is the increase in agency costs due to the dilution of management ownership, which emphasize the principal-agent misalignment. A second explanation is the management attempt to window-dress the accounting numbers in the pre-IPO period, overstating the performance prior to the offering to maximize the capital collection. A further possible justification for the decrease in operating performance is the timing of the offering in coincidence with a period of the issuing firm's extraordinary good performance, which would not be sustained in the following periods. Another important finding of Jain and Kini[60]'s work is the pattern of the operating performance of the firms in which the entrepreneur holds a large percentage of the shares, which tend to perform better with respect to the average.

Through the years, different studies analysed the IPOs' long-run underperformance issue, and some pre-offerings characteristics have been found to affect the share price behaviour of the newly issued stocks. Among these features, of particular interest are firm age, about which Ritter[61] found that younger companies tend to perform worse than older ones, initial price multiples, with Purnanadam and Swaminathan[62] who shown that overvalued IPOs underperform undervalued offerings, firm size and book-to-market ratio, as it has

[58] Loughran, T., and Ritter, J.R., 2000, *"Uniformly Least Powerful Tests of Market Efficiency"*
[59] Jain, B.A., and Kini, O., 1994, *"The Post-Issue Operating Performance of IPO Firms"*
[60] Jain, B.A., and Kini, O., 1994, *"The Post-Issue Operating Performance of IPO Firms"*
[61] Ritter, J., 1991, *"The Long-Run Performance of Initial Public Offerings"*
[62] Purnanandam, A.K., Swaminathan, B., 2004, *"Are IPOs Really Underpriced?"*

been shown by Brav *et al.*[63] that small firms and companies with low book-to-market ratio underperform in the long-run, underwriter reputation and private investment backing, which are going to be discussed more in depth later on.

However, one of the most interesting results regarding this phenomenon is Ibbotson and Jaffe[64]'s finding related to the relation between "hot issue" markets and post-IPO performance. They show that the firms which go public during low-volume periods tend to perform better with respect to the companies which issued stock during high-volume periods. This factor might explain the existence of the underperformance phenomenon, since the issuers want to maximize the price and, subsequently, the money collection through the exploitation of the advantages of "hot issue" markets.

2.4 The role of Underwriters and Ownership Structure in the IPOs Underperformance

2.4.1 The impact of underwriter reputation on the long-run performance

As previously mentioned, the underwriter reputation is considered as one of the keys characteristics which is linked to the after-market performance of the newly issued stocks. Carter *et al.*[65] show that, as for underpricing, hiring a prestigious underwriter reduces the underperformance in the three years after the flotation. However, it has to be considered that this is not a firm-specific characteristic and so it is not the real link with the performance of the issuing firms. In fact, while the age and the size of a company affect its efficiency directly, the underwriter choice does not change the quality nor the risk of the issuer. As for its connection with underpricing, while considering the underperformance phenomenon the banks reputation has mainly the role of signalling the riskiness and the quality of the issuing firm. Recalling the signalling theory and the issuers' interest in being perceived as low-risk companies through the appointment of prestigious banks as lead underwriters, it can be said that it is up to the high-reputation investment banks to decide to which firm grant their services. It goes without saying that the higher the investment bank reputation, the lower its willingness to accept the underwriter position in risky flotations. Consequently, prestigious banks underwrite the IPOs of high-quality firms, which are the firms expected to perform better in the future.

The selection made by the underwriters is performed through a scrutiny of the firm's financial information and this procedure, according to Chang *et al.*[66], helps the prestigious banks to control for the earnings management practices and to minimize them. Recalling the work by Jain and Kini[67], financial data window-dressing is one of the causes of the decrease in operating performance in the post-IPO period, and

[63] Brav, A., Geczy, C. and Gompers, P.A., 2000, *"Is the Abnormal Return Following Equity Issuance Anomalous?"*
[64] Ibbotson, R.G., and Jaffe, J.F., 1975, *""Hot Issue" Market"*
[65] Carter, R.B., Dark, F.H., and Sapp, T.R.A., 2010, *"Underwriter reputation and IPO issuer alignment 1981-2005"*
[66] Chang, S.C., Chung, T.Y., and Lin, W.C., 2010, *"Underwriter reputation, earnings management and the long-run performance of initial public offerings"*
[67] Jain, B.A., and Kini, O., 1994, *"The Post-Issue Operating Performance of IPO Firms"*

having the possibility to control for it is positive for the long-run performance. In fact, Chang *et al.*[68] demonstrate that the more prestigious the underwriter is, the less the issuer uses earnings management, at least for what regards the anticipated recognition of current accruals.

In addition to the certification role, Dong *et al.*[69] consider two more underwriter's functions as long-run performance influencers. The first one they consider is the marketing procedure provided to boost the interest of the investors in the flotation. A well-done marketing increases the demand and the investor base, subsequently enhancing the risk sharing, the liquidity and, thanks also to the price support procedures such as price stabilization and penalty bids, the stability of the after-market price. The other function they analyse is the information production during the bookbuilding period which, if performed adequately, diminishes the possibility of investors' valuation biases. More specifically, it reduces the overpricing bias of the optimistic investors, more robust in information-lacking offerings, eliminating the overvaluation correction needed otherwise.

Even considering the differences between high-reputation and low-reputation underwriter, Carter *et al.*[70] show how from the 1990 to the first years of the 21st century there has been a declining trend in the match-adjusted IPOs returns, especially if compared with the data from the 1980s. However, this pattern can be explained by market and external factors, and so not directly attributable to the issuing firms or to the underwriters. In every case, the flotations underwritten by more prestigious investment banks have shown to be better than the others both in the performance and in the survival rate, demonstrating once more the impact of the underwriter reputation on the underperformance phenomenon.

2.4.2 Underwriter reputation and underperformance hypothesis

Considering the previous literature regarding the link between underwriter reputation and long-run performance, after testing for the existence of the underperformance phenomenon in the Italian IPO market, in this work it will be tested whether the offerings with more prestigious underwriters outperforms the others.

$H_{1,4}$: IPOs perform worse than the benchmark in the three-years period

$H_{0,4}$: IPOs do not perform worse than the benchmark in the three-years period

$H_{1,5}$: IPOs underwritten by more prestigious banks have better match-adjusted returns with respect to IPOs underwritten by less prestigious banks

$H_{0,5}$: IPOs underwritten by more prestigious banks have worse match-adjusted returns with respect to IPOs underwritten by less prestigious banks

---

[68] Chang, S.C., Chung, T.Y., and Lin, W.C., 2010, *"Underwriter reputation, earnings management and the long-run performance of initial public offerings"*

[69] Dong, M., Michel, J.S., and Pandes, J.A., 2011, *"Underwriter Quality and Long-Run IPO Performance"*

[70] Carter, R.B., Dark, F.H., and Sapp, T.R.A., 2010, *"Underwriter reputation and IPO issuer alignment 1981-2005"*

2.4.3 Long-run performance of private equity-backed IPOs

A further characteristic associated with a better after-market performance is the presence of private investment bodies among the pre-IPO owners. As for the underpricing phenomenon, the backing from a venture capital or a buy-out firm is considered by the market as a synonym of quality.

About the venture capitals impact on the long-run performance of the initial public offerings, an interesting finding was made by Brav and Gompers[71], who identified the tendency of the VC-backed IPOs to outperform the non-backed ones in the five years after the flotations only when the returns are weighted equally, while the difference in the value-weighted returns have no significance. This result is due to the poor performance of the smaller non-backed issuers, that lowers the overall efficiency of this kind of offerings. In line to this study, Bessler and Seim[72] found a positive relation between the presence of a venture capital prior to the flotation and the long-run stock price performance in the European IPO market. In fact, according to their work, VC-backed offerings outperform the non-backed ones by 18.30% after 750 days of trading, which are roughly three years, and perform better than the market index in the first year after the flotation. This phenomenon is due, in their view, to the venture capitals' ability to timing the exit when the valuation is at its peak and to the negative reactions by the market to their exit, due to a feeling of overpricing and reduced monitoring by the new investors. However, a different result was reported by Belghitar and Dixon[73] about the performance of VC-backed IPOs in the English market. According to their work, both venture capital-backed and non-backed offerings underperform the benchmarks and there is no significant difference between the performance of the two groups during the three years after the flotation. Nonetheless, considering the differences among the different markets and the discrepancy in the models used in the various studies, it is possible that this outcome depends on the English market characteristic and on the particular methodology adopted.

On the other hand, the literature about the buy-out firms' impact on the secondary market performance of the newly issued stocks is more homogeneous regarding the results. Cao and Lerner[74] and Levis[75] asses that BO-backed firms perform better in the years after the flotation with respect to the other companies. In particular, Cao and Lerner[76] show an overwhelming performance of American BO-backed IPOs also with respect to the market during year one, four and five, while Levis[77] demonstrate the same pattern for the English offerings during the first three years of trade. The logic behind this might be dictated by the firms' characteristics, since companies backed by buy-out firms tend to be larger and more profitable even in the

---

[71] Brav, A., and Gompers, P.A., 1997, *"Myth or Reality? The Long-Run Underperformance of Initial Public Offerings: Evidence from Venture and Nonventure Capital-Backed Companies"*
[72] Bessler, W., and Seim, M., 2012, *"The Performance of Venture-backed IPOs in Europe"*
[73] Belghitar, Y., and Dixon, R., 2012, *"Do venture capitals reduce underpricing and underperformance of IPOs?"*
[74] Cao, J., and Lerner, J., 2009, *"The performance of reverse leveraged buyouts"*
[75] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*
[76] Cao, J., and Lerner, J., 2009, *"The performance of reverse leveraged buyouts"*
[77] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*

periods prior to the offering, and have a better use of leverage with respect to the others. Regarding the leverage, contrary to Modigliani and Miller[78]'s trade-off theory, according to which there must be a compromise between a high level of debt, as it boosts the firm's value, and a reasonable level of leverage, in order not to be in financial distress, these studies do not report a lower stock price performance for the companies with higher leverage after the IPO. This is most likely due to the experience of the buy-out firms, which are able to exploit the benefits of the leverage without exceeding in using it and usually take public the companies only when they are best performing and are no more risky. A further explanation to the different stock price performance among PE-backed and non-backed companies is given by Katz[79], who shows the tendency of ones owned by private equity firms to perform less earning management both pre and post-IPO, defer the recognition of economic earnings and, more generally, have a higher-quality earnings report with respect to the other firms.

However, even if these two investment bodies have some similarities, it is not assured whether they have the same impact on the long-run performance or not. Analysing the English IPO market, Levis[80] shows a better performance of the BO-backed firms with respect to the VC-backed and the non-backed ones, explained by the better use of leverage and by the reverting-to-the-mean trend of the more overvalued IPOs, generally VC-backed and non-backed as shown by the literature about underpricing. On the other hand, a more recent study about the American market in the 21st century made by Buchner *et al.*[81] reveals a non-significant difference in the three-years period after the flotation between venture-backed and buy-out-backed firms for what regards risk-adjusted returns. These two different findings, however, are not mutually exclusive, but might coexist. In fact, this discrepancy might be due to the different economic conditions between the two periods analysed, one subsequent to the other, or to the peculiar characteristics of the two different markets, the American and the English.

2.4.4 Pre-IPO private investments and underperformance hypothesis

Taking into account the previously described findings, this work will analyse the effect of the private equity investments in the period prior to the IPO on the three-year stock price performance of the Italian newly listed companies. To do so, it will be observed whether the PE-backed firms outperform the non-backed ones in the first three years after the flotations.

$H_{0,6}$: PE-backed firms outperform non-backed companies in the three-years period
$H_{1,6}$: PE-backed firms do not outperform non-backed companies in the three-years period

---

[78] Modigliani, F., and Miller, M.H., 1963, *"Corporate Income Taxes and the Cost of Capital: A Correction"*
[79] Katz, S.P., 2009, *"Earnings Quality and Ownership Structure: The Role of Private Equity Sponsors"*
[80] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*
[81] Buchner, A., Mohamed, A., Wagner, N., 2019, *"Are venture capital and buyout backed IPOs any different?"*

2.5 The Italian IPO market

While the American IPO market is the centre of both underpricing and underperformance studies, the Italian one might be considered peripheral for the volume of flotations and the quantity of researches about the topic. However, the results seem to be in line with the ones from the more developed markets, with newly issued firms which gain during the first trading day and underperform with respect to the market in the long-run.

Considering underpricing, are of particular interest the findings made by Arosio *et al.*[82] about the last years of the 20th century. In fact, while the first-day returns in the 1980s and in the early 1990s was 28.33%, in the last 5 years of the millennium it was only 8.12%. These results, which diverge from the American data according to which in those years underpricing increased, might be explained by the switch in the pricing process from the fixed-price to the bookbuilding, a change which decreased the information asymmetry between the parties. The reduced level of underpricing following the adoption of the bookbuilding process is also described by Dell'Acqua *et al.*[83], who found even lower returns than the previous study with an average level of 6.75%. The impact of the private equities' investments on the underpricing phenomenon is negative, although the explanation for such an event is not unique. In fact, while Ferretti and Meles[84] and Pennacchio[85] attribute the ability to reduce underpricing to the certification theory, and subsequently to the ability by PEs to reduce the information asymmetry, Meles[86] imputes it to the market power hypothesis, the private equities' force to attract the key investors through the previously established relationship, rejecting the certification role of both VCs and BOs.

On the other hand, a similar difference between the 1990s and the previous period was found also in the long-run performance of newly issued stocks. As shown by Arosio *et al.*[87], in the 1980s the IPOs' three-years performance was not statistically different with respect to the market, used as benchmark, while in the following decade they turned out to underperform such benchmark. An analogous result was found by Viviani *et al.*[88], who noticed an 11.9% of underperformance in the three-years period between 1995 and 2005 of the newly issued stocks with respect to the MIBTEL index. Considering the effect of PE-backing on the long-run performance it seems that, as shown by Rossi[89], the presence of venture capitals is only beneficial in the first twelve months, even if the overall results for both VC-backed and non-backed firms was negative with respect to the market index and not statistically difference among the two groups.

---

[82] Arosio, R., Giudici, G., and Paleari, S., 2000, *"What Drives the Initial Market Performance of Italian IPOs? An Empirical Investigation on Underpricing and Price Support"*

[83] Dell'Acqua, A., Etro, L.L., Teti, E., Murri, M., 2015, *"IPO underpricing and aftermarket performance in Italy"*

[84] Ferretti, R., and Meles, A., 2011, *"Underpricing, wealth loss for pre-existing shareholders and the cost of going public: the role of private equity backing in Italian IPOs"*

[85] Pennacchio, L., 2014, *"The causal effect of venture capital backing on the underpricing of Italian initial public offerings"*

[86] Meles, A., 2011, *"Do private equity investors create value for Italian initial public offerings?"*

[87] Arosio, R., Giudici, G., and Paleari, S., 2001, *"The Market Performance of Italian IPOs in the Long-Run"*

[88] Viviani, D., Giorgino, M., and Steri, R., 2008, *"Private Equity-Backed IPOs and Long-Run Market Performance Analysis of Italian Firms"*

[89] Rossi, F., 2012, *"The long-run performance of IPOs in Italy: a comparison of venture and non-venture-backed companies"*

3. Data and Methodology

To conduct the study, a quantitative approach has been chosen. The data used to analyse the existence and the impact of both underpricing and underperformance in the Italian IPO market have been collected from Thomson Reuters Eikon (from now on Eikon) for the flotations which happened between the second half of year 2000 and the end of year 2016. In addition to Eikon, the website of Borsa Italiana, the Italian stock exchange, and the one of the Italian Private Equity, Venture Capital and Private Debt association (AIFI) have been used to gather data and information about the offerings. Among all them, there have been excluded the firms belonging to the Financial and Real Estate sectors and those which data about the offer price were not available on Borsa Italiana website. The final pool of IPOs adopted in this study is composed by 111 firms, and all of them have been used in both the underpricing and the underperformance analysis. The selected benchmark for the underperformance analysis is the FTSE MIB index, which data have been collected from Eikon.

The companies have been divided in PE-backed and non-backed according to the information provided by Eikon and the data available on the AIFI website. A PE-backed firm is defined as a company with at least one PE owner, independently on the percentage of ownership. The result of this separation is 22 PE-backed flotations and 89 non-backed offerings.

A further division between the IPOs underwritten by high-reputation and low-reputation banks have been done according to their market share, as suggested my Megginson and Weiss[90], adopting both the equally-weighted and the proceeds-weighted metric. According to the first one, it is calculated the number of deals underwritten by each bank and, among all the underwriters in the pool, the ones with more deals than the median are considered prestigious, while the second metric consists in the evaluation of the amount of money raised by each bank during the period and again, similarly to the first method, the ones above the median are considered to have a high reputation. These classifications provided two different results, with 86 IPOs underwritten by prestigious banks and 25 by low-reputation ones in the equally-weighted case, while the proceeds-weighted metric produced 70 offerings with high-reputation underwriters and 41 with low-prestigious ones. The data regarding the underwriters have been collected from the single prospectuses, available on the Borsa Italiana website, and among all the underwrites only the sponsor has been selected for the reputation analysis. In case of multiple sponsors, the one that appeared the most during the 16-years period have been picked.

3.1 Methodology for the underpricing analysis

As for the underpricing analysis, the main data used are the offer price (P_0), collected from the Borsa Italiana website, and the first trading day closing price (P_c), gathered from Eikon. They are important since they are

---

[90] Megginson, W.L., and Weiss, K.A., 1991, *"Venture Capitalist Certification in Initial Public Offerings"*

the variables which compose Ritter[91]'s underpricing formula, according to which underpricing is defined as the difference between the first day closing price and the offer price, all divided by the offer price. This is the methodology adopted in this study:

$$U = \frac{P_c - P_0}{P_0}.$$

After its computation for each firm, the average level of underpricing for the whole pool of IPOs and for each sub-group described above is calculated. In order to check for the existence of the underpricing phenomenon in the Italian IPO market, a one sample T-test is performed for the entire group of offerings. To test the differences between PE-backed and non-backed firms, a two sample T-test with unequal variance is performed. The same test is also performed to prove the difference between prestigious and non-prestigious underwriters. So, considering the two different methodologies to evaluate the banks' reputation, a total of three two sample T-test and a single one sample T-test have been performed.

In two different regressions, one for each reputation methodology adopted, are studied the different explanatory variables for underpricing. A PE dummy and a high-reputation dummy are included as dependent variables to test if they can explain underpricing.

The size of the floated firm, another explanatory variable, is evaluated through the value of the total assets at the time of the offering, in line with Levis[92]'s study. These data were collected from Eikon. A different variable is maturity. Since no data related to the age of the firms is available in the used database, its proxy has been decided to be the revenue growth in the year after the IPO. It is considered to reflect the stability of the company at the time of the offering, with a lower growth rate as an evidence of higher security and maturity. In contrast with Cao and Lerner[93], who used as leverage variable the debt-to-asset ratio, in this study the proposed ratio is debt-to-equity, a slightly different one. The data, which are timed at the IPO date, are collected from Eikon database.

In addition to these explanatory variables, a dummy for the sector is considered. The whole pool of companies has been collected into 9 sectors, according to the Eikon database, which are tested together in the main regression with the other variables.

Further regressions are performed to test the impact and the significance of the explanatory variables above mentioned depending on the three central dummy variables, PE backing and the two reputational dummies. It is done since the different variables might impact in different ways the underpricing phenomenon depending on the ownership and on the bank that underwrote the Flotation. These regressions, known as regressions with interaction effects, have variables which combine the dummies with each independent

---

[91] Ritter, J.R., 1984, *"The "Hot Issue" Market of 1980"*
[92] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*
[93] Cao, J., and Lerner, J., 2009, *"The performance of reverse leveraged buyouts"*

variable. In this type of analysis, the sectorial dummies have not been taken into account, but only size, maturity and leverage.

The regression coefficients and their significances are used to test the impact that these independent variables have on the underpricing of the Italian IPO market.

3.2 Methodology for the underperformance analysis

The methodology adopted in this study for the underperformance analysis is the calculation of the buy and hold abnormal return (BHAR) from the first-day closing price to the same day three years onwards. The selected time span of three years is based on Ritter[94] and Loughran and Ritter[95], who constructed the basis for this type of studies. The first step is the computation of the buy and hold return (BHR) for each firm using the formula

$$BHR_i = \left(\frac{P_{i,t=3} - P_{i,t=0}}{P_{i,t=0}}\right),$$

where P_i is the stock price of firm i, $t=0$ is the floating time and $t=3$ is three years after the offering. After this, the BHAR is calculated subtracting to the BHR the three-year performance of the benchmark, in this case the FTSE MIB index, with the formula

$$BHAR_i = BHR_i - \left(\frac{I_{t=3} - I_{t=0}}{I_{t=0}}\right),$$

Where I is the index price, $t=0$ is the floating time of the interested firm and $t=3$ is three years after the offering. Among the 111 firms, none has been excluded from the underperformance analysis.

To test the existence of the underperformance phenomenon, a one sample T-test is performed, similarly to the underpricing test. Three different two sample T-tests are performed to check whether the backing from the PE firms and the underwriter reputation, calculated with both the methods, affect the long-run stock performance of newly issued companies.

Similarly to the underpricing analysis, two regressions, one for each underwriter reputation model, are performed to study the effect that some variable might have on the 3-years performance. Also in these ones, a PE dummy and a high-reputation dummy are tested as explanatory variables together with the sectorial dummies previously used.

The leverage ratio used as explanatory variable is the three-years average Debt-to-equity ratio, in line with Kaplan[96], which data have been collected from Eikon. For what regards the operating margin variable,

---

[94] Ritter, J.R., 1991, *"The Long-Run Performance of Initial Public Offerings"*
[95] Loughran, T., and Ritter, J.R., 1995, *"The New Issue Puzzle"*
[96] Kaplan, S., 1989, *"The Effects of Management Buyouts on Operations and Value"*

the three-years EBIT margin is used as measure, a similar variable with respect to Levis[97]'s EBITDA to sales. Again, the data have been gathered from Eikon. As for maturity, in line with Ritter[98]'s study the selected explanatory variable is the revenue growth during the timespan. The lower the growth rate, the more stable and mature the company. The last variable is the level of Assets, used as measure of size. The three-years average is used in this study, as it has been done by Levis[99].

Again, three regressions with interaction effects are performed. Similarly to the underpricing case, the sectorial dummies have not been considered among the independent variables while the other four, size, maturity, leverage and operating margin have been tested to see whether they have different impacts on the long-run stock performance of the newly issued firms depending on the characteristics of the company at the time of the flotation.

The impact of these different variables is estimated through the estimation coefficient and its significance.

3.3 Data Description

The whole pool of IPOs, adopted for both the underpricing and the underperformance analysis, is referred to a 16-years period, starting in year 2000 and finishing in year 2016. Figure 1 shows how the offerings were distribution across time, and a pattern is identifiable. During periods of prosperity the number of flotations is higher with respect to the two periods of crisis, the Dot.com bubble and the financial crisis.

Figure 1 – *Number of IPOs per year*
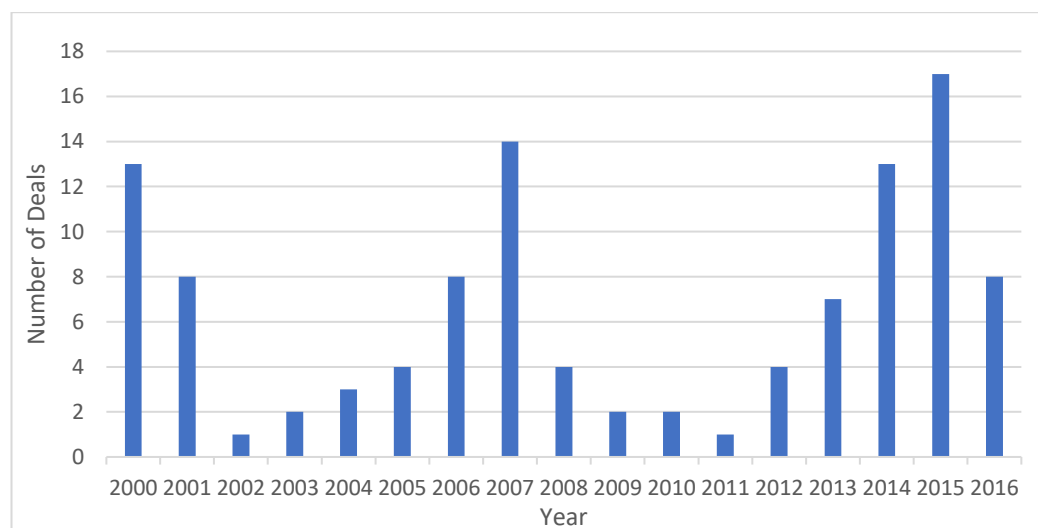
A similar distribution across time is shown in Figure 2, Figure 3 and Figure 4, however in these cases the totality of the IPOs is divided, depending on the relevant characteristic, into PE and non-PE-backed or into

---

[97] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*
[98] Ritter, J.R., 1991, *"The Long-Run Performance of Initial Public Offerings"*
[99] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*

high and low-reputation underwriter. More specifically, 20% of the firms in this study were backed by a private equity firm, and considering the reputation of the underwriter, 77% of them were underwritten by prestigious banks according to the equally-weighted methodology while only 63% of the firms had prestigious underwriters with the proceeds-weighted method, as it is possible to see in Appendix 1.

Figure 2 – *Number of PE vs. Non-backed per year*
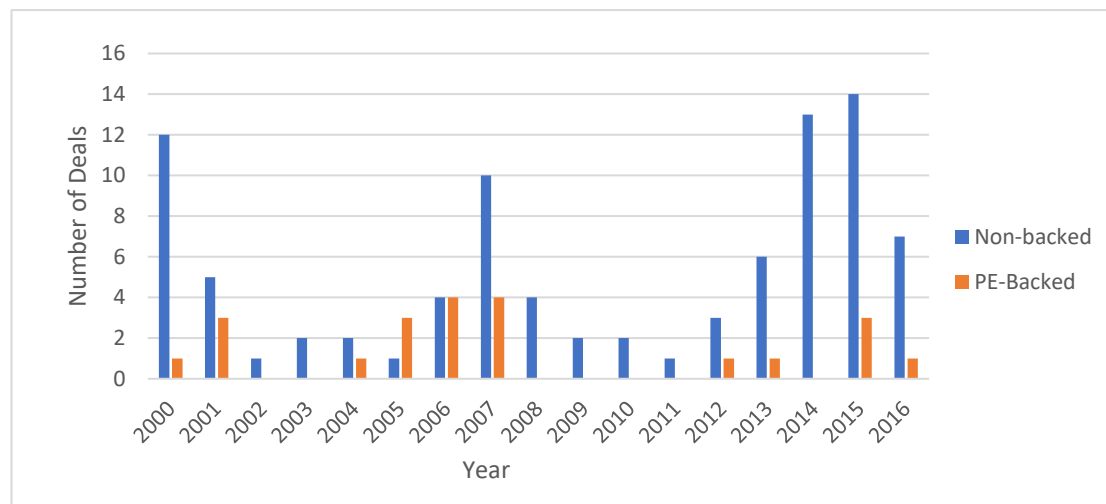
Figure 3 – *Number of flotations underwritten by high and low reputation (Equally-weighted) per year*
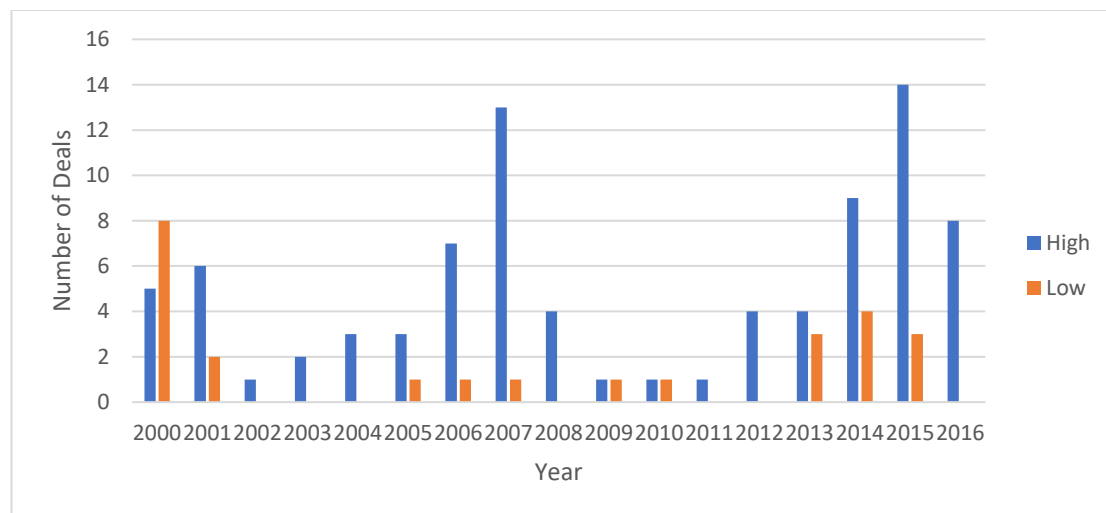
Figure 4 – *Number of flotations underwritten by high and low reputation (Proceeds-weighted) per year*
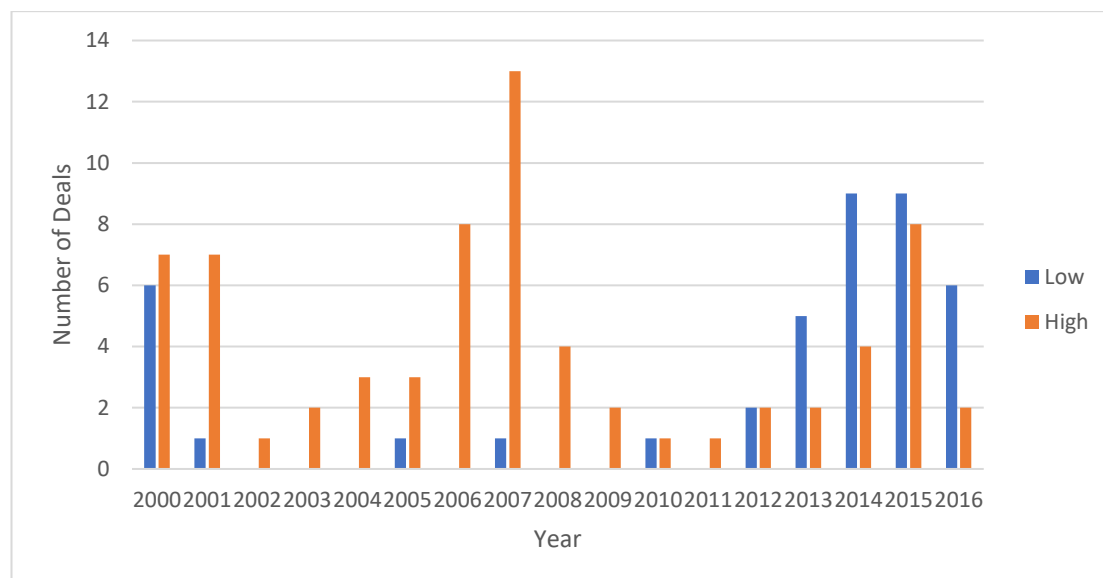
Among the companies analysed, the sectors more represented are Consumer Discretionary and Industrials, both with 23% of the totality of the deals, while the least represented is Materials with only 2% of the IPOs. For further information about the division amongst the sectors, see Appendix 2. The descriptive statistics of the underpricing regression is summarised in Table 1, with the minimum, the maximum, the mean and the standard deviation of the variables studied, while in Table 2 is possible to see the descriptive statistics for the underperformance regression.

Table 1 – *Descriptive statistics of the underpricing regression*

	Minimum	Maximum	Mean	St.Dev.
Underpricing	-100%	747%	7%	0,918399826
Maturity	-68%	289142%	2638%	274,4102398
Leverage	0	1302,662589	154,0428425	232,8244705
Size	174440	10018000000	477373750,1	1229852326

Table 2 – *Descriptive statistics of the underperformance regression*

	Minimum	Maximum	Mean	St.Dev.
BHAR	-131%	187%	5%	0,584954487
Maturity	-63%	144523%	1327%	13715%
Leverage	0	553,8133466	96,19815219	112,580881
Size	2891770	9893666667	563954019	1313690476
Op.Margin	-787,97358	345,4391063	-0,7033937	93,52541613

4. Results

The analysis performed in this thesis is aimed to test whether the backing from a PE firm and the reputation of the bank that underwrote the flotation have an impact on the underpricing of the Initial Public Offerings and on the three-years stock price performance of the newly issued firms in the Italian stock market. Recalling the second chapter, the hypothesis tested in this study are:

$H_{1,1}$: Underpricing exists in the Italian IPO market

$H_{0,1}$: Underpricing does not exists in the Italian IPO market

$H_{1,2}$: Underpricing is less severe for offerings with more prestigious underwriters

$H_{0,2}$: Underpricing is more severe for offerings with more prestigious underwriters

$H_{1,3}$: PE-backed IPOs have less underpricing than non-backed offerings

$H_{0,3}$: PE-backed IPOs have no different level of underpricing than non-backed offerings

$H_{1,4}$: IPOs perform worse than the benchmark in the three-years period

$H_{0,4}$: IPOs do not perform worse than the benchmark in the three-years period

$H_{1,5}$: IPOs underwritten by more prestigious banks have better match-adjusted returns with respect to IPOs underwritten by less prestigious banks

$H_{0,5}$: IPOs underwritten by more prestigious banks have worse match-adjusted returns with respect to IPOs underwritten by less prestigious banks

$H_{0,6}$: PE-backed firms outperform non-backed companies in the three-years period

$H_{1,6}$: PE-backed firms do not outperform non-backed companies in the three-years period

4.1 Underpricing results

Considering the data regarding the underpricing phenomenon, a contradiction between this study and previous researches arises. Differently from Ibbotson[100]'s findings, the dataset constructed with Italian IPOs from 2000 to 2016 is not affected by underpricing. Among the 111 observations, only 47% shows an increase in stock price between the offering price and the first trading day closing price, even if the average underpricing in the dataset is 6.74%. This finding is supported by the results of the one sample T-test performed on the whole sample, which turned out to be positive but not significant. In fact, as it is possible to see in Table 3, the p-

---

[100] Ibbotson, R.G., 1975, *"Price Performance of Common New Stock Issues"*

value is larger than 0.1, the value correlated with the significance at 10% level. Thus, the hypothesis related to the existence of the underpricing phenomenon in the Italian IPO market in the time span analysed is rejected.

Table 3 – *Underpricing existence results*

	Underpricing
Mean	0,0674
Variance	0,8435
t Stat	0,7733
p-value	0,2205

Another interesting result arises from the analysis of the PE-backed and the non-backed offerings. The difference in the mean underpricing between the two groups is almost of 20%, with the average of the PE-backed of 22.20% and the one of the non-backed of 2.92%. This result is, again, in contrast with Barry *et al.*[101] and Megginson and Weiss[102], according to whom the former group should experience less underpricing because of the certification hypothesis. However, this result is mainly due to an outlier among the PE-backed firms without which their average would have been negative. But, in the end, this result has poor impact on the literature because of the lack of significance of the T-test performed between the two groups, as shown in Table 4, leading to the rejection of the second hypothesis.

Table 4 – *PE vs. Non-backed underpricing results*

	PE	Non
Mean	0,2218	0,0291
Variance	2,7392	0,3931
t Stat	0,5369	
p-value	0,2982	

The analysis of the underwriter reputation on the underpricing phenomenon is not so different from the two previously described. The differences between the averages of the offerings underwritten by prestigious banks and those underwritten by low-reputation banks, in both the equally-weighted method and the proceeds weighted, is positive and in favour of the high-reputation samples, with a difference of 3.5% in the equally-weighted test and 12% in the proceeds-weighted one. Similarly to the PE-backed case, this result is against the previous literature, and more specifically with Carter and Manaster[103], according to which the flotations underwritten by more prestigious banks have less underpricing. However, the non-significance of these results, shown in Table 5 and Table 6, makes this study not relevant for the previous literature's findings.

---

[101] Barry, C.B., Muscarella, C.J., Peavy III, J.W., and Vetsuypens, M.R., 1990, *"The role of venture capital in the creation of public companies"*
[102] Megginson, W.L., and Weiss, K.A., 1991, *"Venture Capitalist Certification in Initial Public Offerings"*
[103] Carter, R.B., and Manaster, S., 1990, *"Initial Public Offerings and Underwriter Reputation"*

Table 5 – *Reputation (Equally-weighted) results underpricing*

	High	Low
Mean	0,0754	0,0398
Variance	0,8672	0,7933
t Stat	0,1738	
p-value	0,4314	

Table 6 – *Reputation (Proceeds-weighted) results underpricing*

	High	Low
Mean	0,1184	-0,0197
Variance	1,0718	0,4582
t Stat	0,8491	
p-value	0,1988	

The results of the multiple regressions regarding the explanatory variables are shown in Table 7 and in Table 8, one for each underwriter's reputation calculation methodology. As it is possible to see, no explanatory variable is statistically significant in the regressions, meaning that they do not affect underpricing. However, since the result of the first T-test is not significant, it is not particularly strange not to find an explanatory variable affecting the dependent variable, since it is supposed to be 0.

Table 7 – *Underpricing regression coefficients with equally-weighted methodology*

	Coefficients	Standard Error	t Stat	P-value
Size	6,90651E-11	8,12271E-11	0,85027172	0,397267948
Leverage	-0,00033315	0,000394429	-0,84465044	0,400384509
Maturity	-0,00039327	0,000330081	-1,19143624	0,236389447
Communication Services	0,332744017	0,271090604	1,227427333	0,222632523
Information Technology	-0,22463841	0,294124281	-0,76375336	0,446867986
Consumer Staples	-0,01400914	0,408093851	-0,03432822	0,972685965
Consumer Discretionary	0,350637256	0,288799915	1,214118278	0,227650261
Industrials	0,114932701	0,259817906	0,442358659	0,659214474
Utilities	-0,19433183	0,436117163	-0,44559547	0,656882427
Health Care	-0,38440187	0,421739989	-0,91146649	0,364309244
Materials	-0,04725504	0,705202013	-0,06700923	0,946712281
Energy	-0,06762504	0,587103155	-0,11518426	0,908537182
PE-backed	0,183182386	0,248690742	0,736587077	0,463151251
Reputation	-0,04450497	0,226031796	-0,19689695	0,844320147

Table 8 – *Underpricing regression coefficients with proceeds-weighted methodology*

	Coefficients	Standard Error	t Stat	P-value
Size	6,57E-11	8,33E-11	0,788367	0,43240476
Leverage	-0,00032	0,000394	-0,80784	0,42116078
Maturity	-0,00039	0,000331	-1,18494	0,238938
Communication Services	0,286629	0,257268	1,114126	0,2679783

Information Technology	-0,26179	0,262575	-0,99702	0,32123485
Consumer Staples	-0,06293	0,382628	-0,16446	0,86970911
Consumer Discretionary	0,301093	0,238604	1,261891	0,21001373
Industrials	0,068026	0,237586	0,286322	0,77524198
Utilities	-0,25263	0,396266	-0,63752	0,52528655
Health Care	-0,43264	0,423632	-1,02125	0,30967525
Materials	-0,12183	0,700159	-0,174	0,86222727
Energy	-0,1379	0,578702	-0,23829	0,8121599
PE-backed	0,162355	0,265674	0,611105	0,54255924
Reputation	0,027129	0,215307	0,126003	0,89999061

Both the regressions tend to explain about 10% of the underpricing phenomenon, as it is possible to see with the R^2 in Table 9 and Table 10, meaning that a large part of the phenomenon is not related to the variables analysed.

Table 9 – *Summary for underpricing regression with equally-weighted methodology*

Multiple R	0,31831118
R Square	0,101322008
Adjusted R Square	-0,02942865
Standard Error	0,929654315

Table 10 - *Summary for underpricing regression with proceeds-weighted methodology*

Multiple R	0,317978
R Square	0,10111
Adjusted R Square	-0,02967
Standard Error	0,929764

Table 11, Table 12 and Table 13 show the results from the underpricing regressions with interactions. As it is possible to see, the only variables that have significance are the interaction between size and PE-backing and the one between leverage and PE-backing. All the other interaction variables in the three regressions are not statistically significant. For what regards the size interaction variable, the fact that the beta coefficient is positive is in contrast with the study from Levis[104], who argues that the larger the size of the PE-backed firm, the more transparent and riskless it is, leading to less request for underpricing by the investors. In this study, however, the larger the PE-backed company, the higher the degree of underpricing, contradicting the previously mentioned theory. The leverage ratio interaction variable's beta coefficient, on the other hand, is negative, meaning that the higher the level of debt relative to the equity of a PE-backed firm, the lower the required underpricing is. This is contrary to Modigliani and Miller[105] theory, according to which a compromise between a high level of debt, which increases the performance of the firm in exchange of a higher risk of default, and a reasonable degree of leverage, which slows down the performance but make the company more

---

[104] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*
[105] Modigliani, F., and Miller, M.H., 1963, *"Corporate Income Taxes and the Cost of Capital: A Correction"*

safe, since the high-leveraged firms are considered, according to the results, less riskier than the others. This, however, might be due to the better understanding of the PE companies on how which level of leverage to use, ability recognised by the market.

Table 11 – *Coefficients of the underpricing regression with PE as interaction variable*

	Coefficients	Standard Error	t Stat	P-value
Size x PE	1,03902E-09	3,02095E-10	3,439396854	0,000848641
Leverage x PE	-0,00193256	0,001001355	-1,92994497	0,056419012
Maturity x PE	-0,36589107	0,5494058	-0,66597598	0,506944692
Rep Eq-weighted x PE	-0,02925842	0,579769471	-0,05046561	0,959851024
Rep Pr-weighted x PE	0,1385578	0,624477738	0,221877886	0,824856958
Size x Non	-1,3253E-11	7,49267E-11	-0,17687728	0,859958995
Leverage x Non	-0,0002719	0,000372988	-0,72898699	0,467696687
Maturity x Non	-0,00028659	0,000314908	-0,91007937	0,364947432
Rep Eq-weighted x Non	-0,01068224	0,186939628	-0,05714272	0,9545444
Rep Pr-weighted x Non	0,113546124	0,218690457	0,519209321	0,604750678

Table 12 - *Coefficients of the underpricing regression with reputation (equally-weighted) as interaction variable*

	Coefficients	Standard Error	t Stat	P-value
Size x High	4,61054E-11	7,02047E-11	0,656728775	0,512819983
Leverage x High	1,9099E-08	0,000423358	4,51133E-05	0,999964092
Maturity x High	-0,00030785	0,000322019	-0,95601067	0,341305305
PE x High	0,251716872	0,225048402	1,118501038	0,265954906
Size x Low	3,75676E-10	4,05923E-10	0,925485808	0,356876585
Leverage x Low	-0,00068861	0,00060727	-1,13395105	0,259447406
Maturity x Low	-0,03093352	0,304090518	-0,1017247	0,919172963
PE x Low	-0,22413978	0,696359469	-0,32187368	0,748200725

Table 13 - *Coefficients of the underpricing regression with reputation (proceeds-weighted) as interaction variable*

	Coefficients	Standard Error	t Stat	P-value
Size x High	6,08524E-11	7,07832E-11	0,859701744	0,391950009
Leverage x High	-0,00013341	0,000498883	-0,26742047	0,789680179
Maturity x High	-0,03839121	0,164865611	-0,23286364	0,816329403
PE x High	0,255196451	0,225956806	1,129403689	0,261351017
Size x Low	-8,2487E-10	1,99636E-09	-0,41318535	0,680329752
Leverage x Low	-0,00014389	0,000550612	-0,26133361	0,794357093
Maturity x Low	-0,00028917	0,000324344	-0,89156763	0,374702771
PE x Low	-0,41251593	0,949842047	-0,43429951	0,664979397

4.2 Underperformance results

The three-years buy-and-hold abnormal returns of the 111 companies analysed in this study are not in line with Ibboston[106]'s and Ritter[107]'s findings. In fact, while it has been shown in the American IPO market that

---

[106] Ibbotson, R.G., 1975, *"Price Performance of Common New Stock Issues"*
[107] Ritter, J.R., 1991, *"The Long-Run Performance of Initial Public Offerings"*

the newly issued firms tend to underperform with respect to the market index and comparative firms, the sample analysed in this research has an average BHAR of 4.58%. This result is, however, not significant, as it is possible to see in Table 14, and so it is not a proper contradiction with respect to the previous studies. It is, instead, a rejection of the hypothesis stating that newly issued firms underperform the market index during the first three-years of trading.

Table 14 – *Underperformance existence*

	Underperformance
Mean	0,04586
Variance	0,34217
t Stat	0,82602
p-value	0,20529

Another contradiction with respect to the previous studies, in this case Levis[108]'s and Brav and Gompers[109]', is the non-significance in the difference in the BHAR between PE-backed and non-backed firms. How it is possible to see in Table 15, the difference between the two groups is of 2.7% in favour of the PE-backed one, which would have been in line with the previous literature in case of significance of the results. Thus, the underperformance hypothesis about the superior long-run performance of the PE-backed firms is rejected.

Table 15 – *PE vs. Non-backed results underperformance*

	PE	Non
Mean	0,0678	0,0404
Variance	0,4790	0,3133
t Stat	0,1719	
p-value	0,4324	

For what regards the underwriter reputation effect on the long-run performance of newly issued firms, there are two different results depending on which methodology is adopted to estimate the prestigiousness of the investment banks. Using the equally-weighted method, as it is possible to see in Table 16, even if the mean BHARs differ by more or less 6%, it is not possible to say that there is a significant difference between the two groups because of the p-value, larger than 0.1. This result is in contrast with the findings made by Carter *et al.*[110] and Chang *et al.*[111], according to which the reputation of the underwriter is considered as a signal of low riskiness and transparency of the issuer.

---

[108] Levis, M., 2010, *"The Performance of Private Equity-Backed IPOs"*
[109] Brav, A., and Gompers, P.A., 1997, *"Myth or Reality? The Long-Run Underperformance of Initial Public Offerings: Evidence from Venture and Nonventure Capital-Backed Companies"*
[110] Carter, R.B., Dark, F.H., and Singh, A.K., 1998, *"Underwriter Reputation, Initial Returns, and the Long-Run Performance of IPO Stocks"*
[111] Chang, S.C., Chung, T.Y., and Lin, W.C., 2010, *"Underwriter reputation, earnings management and the long-run performance of initial public offerings"*

Table 16 - *Reputation (Equally-weighted) results underperformance*

	High	Low
Mean	0,0618	-0,0091
Variance	0,3962	0,1609
t Stat	0,6751	
p-value	0,2511	

In line with these theories, however, is the result using the proceeds-weighted methodology. In fact, in this case the BHARs' difference, shown in Table 17, is 15% and it is also significant at the 10 percent level, as it is possible to see from the p-value which is of 0.08. So, according to the latter result, it is possible to say that the firms who had more prestigious underwriters outperform the ones with less prestigious underwriters, and so it permits to not reject the third underperformance hypothesis.

Table 17 - *Reputation (Proceeds-weighted) results underperformance*

	High	Low
Mean	0,1050	-0,0552
Variance	0,3210	0,3707
t Stat	1,3725	
p-value	0,0869	

Table 18 and Table 19 show the results of the two regressions used to test the impact of the explanatory variable described in the previous section. The only dependent variable that is statistically significant is, in both the regressions, the dummy variable related to the Communication Services sector. The negative beta coefficients mean that the newly issued firms belonging to this sector perform worse than the others of about 36% using the equally-weighted methodology for the estimation of the reputational dummy and about 44% while adopting the proceeds-weighted method.

Table 18 – *Underperformance regression coefficients with equally-weighted methodology*

	Coefficients	Standard Error	t Stat	P-value
Size	6,03769E-11	4,65562E-11	1,296862634	0,197786834
Op Marign	0,001035906	0,000632801	1,637017251	0,104900999
Leverage	0,000593153	0,000510147	1,162709205	0,247829687
Maturity	0,00059882	0,000432179	1,385581378	0,169085459
Communication Services	-0,359047279	0,17083477	-2,1017225	0,038195913
Information Technology	-0,114655585	0,181662707	-0,63114542	0,529445306
Consumer Staples	-0,07803193	0,248617757	-0,31386306	0,754306042
Consumer Discretionary	0,078278802	0,18036701	0,433997339	0,665264181
Industrials	-0,118370441	0,171640065	-0,68964342	0,492082153
Utilities	-0,095137296	0,271367326	-0,35058493	0,726667877
Health Care	0,414057022	0,257753229	1,606408671	0,111468594
Materials	0,254547594	0,432244869	0,58889674	0,557313715
Energy	-0,248580869	0,358741709	-0,69292436	0,490029961

PE-backed	-0,09976517	0,150551036	-0,66266678	0,509131875
Reputation	0,054136309	0,139620877	0,387737924	0,699068371

Table 19 – *Underperformance regression coefficients with proceeds-weighted methodology*

	Coefficients	Standard Error	t Stat	P-value
Size	4,31219E-11	4,75744E-11	0,906410169	0,366988248
Op Marign	0,000950763	0,000624985	1,521257403	0,131482329
Leverage	0,000698721	0,000500923	1,394867092	0,166274976
Maturity	0,000676974	0,000427424	1,58384813	0,116517189
Communication Services	-0,443492541	0,159592497	-2,77890597	0,006562025
Information Technology	-0,142018378	0,158620918	-0,89533197	0,372849102
Consumer Staples	-0,137054508	0,229460786	-0,59728945	0,551720358
Consumer Discretionary	0,02919992	0,147614728	0,1978117	0,84361065
Industrials	-0,197505803	0,154225643	-1,28062882	0,203409473
Utilities	-0,149605109	0,240749614	-0,6214137	0,535800293
Health Care	0,301846421	0,258058496	1,169682169	0,24502476
Materials	0,101453291	0,423062847	0,239806667	0,81099143
Energy	-0,373276022	0,34722107	-1,07503851	0,285052003
PE-backed	-0,182087626	0,159009429	-1,14513728	0,254999141
Reputation	0,196634164	0,131137333	1,499452214	0,13703784

As it is possible to see in Table 20 and in Table 21, the dependent variables in these regressions explain about 20-22% of the independent variables, meaning that only a small part of the three-years BHARs are explained by the selected variables.

Table 20 - *Summary for underperformance regression with equally-weighted methodology*

Multiple R	0,4540
R Square	0,2061
Adjusted R Square	0,0799
Standard Error	0,5596

Table 21 - *Summary for underperformance regression with proceeds-weighted methodology*

Multiple R	0,4723
R Square	0,2230
Adjusted R Square	0,0993
Standard Error	0,5536

The results from the three regressions with interaction are summarized in Tables 22, Table 23 and Table 24. The one performed combining the PE-backing with the other variables resulted in a positive and significant correlation with the three-years performance for the operating margin for the PE-backed firms and for the maturity variable for the non-backed companies. While the first result is expected, since that means that a PE-backed firm with good operating performance tend to outperform the others, the second one is a surprise. In fact, according to the results a non-backed company with higher revenues growth rate during the three years,

and so less maturity, tend to have better performance than the others, being in contrast with Ritter[112]. Looking at the results from the regression performed combining the equally-weighted reputation and the other variables in Table 23 it is possible to see how the only significant variable is the maturity combined with the prestigious underwriters. The positive coefficient is in contrast with Ritter[113]'s findings since, again, the less mature companies tend to outperform the more mature ones. Analysing the results in Table 24 about the proceeds-weighted reputation and the other variables, the significant interaction variables are the operating margin crossed with prestigious underwriters, the maturity crossed with non-prestigious underwriters and the PE-backing combined with low-reputation underwriters. The first one is expected since better performing firms have also better stock price performance, and this is enhanced by the presence of prestigious underwriters. The second one, as previously explained, is not in line with the previous literature and is a bit surprising. On the other hand, the third result is quite straightforward and expected. It turns out that the PE-backed firms with non-prestigious underwriters tend to perform worse than the other companies, as it is possible to see with the negative beta coefficient associated with this interaction variable. This is explained by the signalling theory, with the hiring of a low-reputation underwriter as a signal of riskiness.

Table 22 - *Coefficients of the underperformance regression with PE as interaction variable*

	Coefficients	Standard Error	t Stat	P-value
Size x PE	8,92383E-11	1,81345E-10	0,49209225	0,623743572
Margin x PE	0,005659102	0,003308019	1,710722312	0,090264267
Leverage x PE	-0,000984504	0,001207563	-0,81528108	0,416868515
Maturity x PE	-0,122263171	0,461209291	-0,2650926	0,791489305
Rep Number x PE	-0,348124999	0,344545841	-1,01038805	0,314772529
Rep Value x PE	0,507208466	0,35761829	1,418295651	0,159244706
Size x Non	4,68655E-11	4,523E-11	1,036159737	0,302651935
Margin x Non	0,00050811	0,000643593	0,789489696	0,431712643
Leverage x Non	0,000553132	0,000465691	1,187766635	0,237767229
Maturity x Non	0,000887715	0,000436434	2,034019018	0,044624555
Rep Number x Non	-0,095349093	0,121844291	-0,78254871	0,435759994
Rep Value x Non	0,093578443	0,141469916	0,661472389	0,509846024

Table 23 - *Coefficients of the underperformance regression with reputation (equally-weighted) as interaction variable*

	Coefficients	Standard Error	t Stat	P-value
Size x High	5,08107E-11	4,15592E-11	1,222610606	0,224322139
Margin x High	0,000743496	0,000629215	1,181624271	0,240129545
Leverage x High	0,000347615	0,000584385	0,594839018	0,553281398
Maturity x High	0,00079374	0,000431344	1,840157151	0,06868163
PE x High	0,000624174	0,141944885	0,0043973	0,996500148
Size x Low	4,3817E-11	2,11506E-10	0,207167222	0,836296374
Margin x Low	0,008390443	0,010135304	0,827843248	0,409711098
Leverage x Low	0,000744233	0,000678505	1,096872578	0,275305434

[112] Ritter, J.R., 1991, *"The Long-Run Performance of Initial Public Offerings"*
[113] Ritter, J.R., 1991, *"The Long-Run Performance of Initial Public Offerings"*

Maturity x Low	-0,288031196	0,242669117	-1,18692976	0,238039579
PE x Low	-0,035171243	0,415550376	-0,08463774	0,932716938

Table 24 - *Coefficients of the underperformance regression with reputation (proceeds-weighted) as interaction variable*

	Coefficients	Standard Error	t Stat	P-value
Size x High	3,39655E-11	4,04946E-11	0,838766401	0,403581186
Margin x High	0,002367331	0,001199213	1,974069983	0,051104956
Leverage x High	-8,19112E-05	0,000625128	-0,13103115	0,89601131
Maturity x High	0,305009604	0,18514811	1,647381679	0,102587463
PE x High	0,050728043	0,135971399	0,373078778	0,709871662
Size x Low	4,93414E-10	9,25881E-10	0,532912802	0,595264568
Margin x Low	0,000251448	0,000692177	0,363270774	0,717161835
Leverage x Low	0,000475819	0,000576107	0,825919871	0,410796259
Maturity x Low	0,000878885	0,000419186	2,096646276	0,038523064
PE x Low	-1,396569482	0,555164727	-2,51559477	0,013459248

5. Conclusions

The results of this study regarding the underpricing of the Italian IPOs are not particularly relevant for the literature related to this phenomenon. Even if the first difference between the first-day closing price and the offer price is positive on average, this outcome cannot be considered as a certain conclusion since it is not statistically significant. The non-significance might be explained by the small number of flotations that occurred in the selected time span, from 2001 to 2016, in Italy, which might be too small to perform a proper test, or by a peculiarity of the Italian market. However, the first reason is the most probable one. The same explanation might be the cause of the non-significance of the impact of the PE-backing and of the underwriter reputation on the underpricing phenomenon, which is not in line with the previous studies. However, it is possible that in Italy, differently from the USA where most of the studies have been conducted, the banks prestigiousness has no impact at all on the stock price short-term performance. This is a supposition, since no previous researches on this topic have been done about the Italian IPO market alone. From the investor point of view this means that they are not supposed to have a gain in the short-term, while for the issuing firm this is good news since they are not leaving money on the table during the IPO process. However, for the investor to try to gain a return during the first day, there is the result from the regression with PE with interaction which shows an impact of size and leverage of the PE-backed firms on the underpricing. The companies backed by private equity firms tend to have larger underpricing the larger they are and the lower the leverage is, meaning that the investors should invest only in IPOs of large, backed firms with low leverage to exploit the underpricing phenomenon at their advantage.

Considering the underperformance phenomenon, the results are again not extremely relevant for the literature. During the first three years of trading the Italian newly issued firms tend to outperform the market index, used as the benchmark in this study. However, the non-significance of this result makes it impossible to state that this outcome is the true one. Similarly to the general test, the one performed to check whether the PE-backed firms perform better than the non-backed is positive, meaning that the first group outperform the second one, but not significant. The only characteristic at the time of the IPO that can be used to predict the long-run performance of an issuing firm is the underwriter reputation calculated with the proceeds-weighted methodology. This means that the banks with a lot of experience in large flotations are better in asses the potentiality of the issuing firms, making it beneficial for the issuers to hire such underwriters and for the investors to select the offerings with prestigious investment banks as underwriters. The investors have, however, to pay attention to the sector of the issuing firm; if they invest in a company form the Communication Services sector it is likely that they will underperform with respect to the market, making it more profitable to invest in the FTSE MIB index. Another aspect they might consider in their investment decisions are the operating margin for the PE-backed firms and the maturity for the non-backed, which have an impact on the three-years performance. In fact, it is preferable form an investor point of view to select a backed company with high operating margin to increase its returns, which is quite straightforward since it means that this firm

is able to extract more value from its operations than the others, or to prefer a less mature, non-backed company as investment. According to this study, the companies underwritten by prestigious underwriters, following the proceed-weighted method, tend to perform better when they have higher operating margins, while the companies with less prestigious underwriters suffer in the performance when backed by a private equity firm. Another characteristic that an investor has to control for while taking an investment decision is the maturity stage of the companies with prestigious underwriters, calculated both with the equally and the proceeds-weighted methodology. In fact, in both cases the less mature firms, so the ones with higher revenues growth rate, tend to outperform the other companies, and so are a profitable investment in the three-years period.

Bibliography

Allen, F., and Faulhaber, R., 1989. "Signaling by underpricing in the IPO market", Journal of Financial Economics Vol. 23, 303-323

Arosio, R., Giudici, G., and Paleari, S., 2000. "What Drives the Initial Market Performance of Italian IPOs? An Empirical Investigation on Underpricing and Price Support", 2000 Financial Management Association Conference, Seattle

Arosio, R., Giudici, G., and Paleari, S., 2001. "The Market Performance of Italian IPOs in the Long-Run", EFMA Lugano Meetings

Baron, D.P., 1982. "A Model of the Demand for Investment Banking Advising and Distribution Services for New Issues", The Journal of Finance Vol. 37, 955-976

Barry, C.B., Muscarella, C.J., Peavy III, J.W., and Vetsuypens, M.R., 1990. "The role of venture capital in the creation of public companies", Journal of Financial Economics Vol. 27, 447-471

Beatty, R.P., and Ritter, J.R., 1986. "Investment Banking, Reputation, and the Underpricing of Initial Public Offerings", Journal of Financial Economics Vol. 15, 1986, 213-232

Beatty, R.P., and Welch, I., 1996. "Issuer Expenses and Legal Liability in Initial Public Offerings", The Journal of Law & Economics Vol. 39, 545-602

Belghitar, Y., and Dixon, R., 2012. "Do venture capitals reduce underpricing and underperformance of IPOs?", Applied Financial Economics Vol. 22, 33-44

Benveniste, L.M., Busaba, W.Y., and Wilhelm Jr., W.J., 1996. "Price stabilization as a bonding mechanism in new equity issues", Journal of Financial Economics Vol. 42, 223–255

Bessler, W., and Seim, M., 2012. "The Performance of Venture-backed IPOs in Europe", Venture Capital Vol. 14, 215-239

Brav, A., Geczy, C. and Gompers, P.A., 2000. "Is the Abnormal Return Following Equity Issuance Anomalous?", Journal of Financial Economics Vol. 56, 209-249

Brav, A., and Gompers, P.A., 1997. "Myth or Reality? The Long-Run Underperformance of Initial Public Offerings: Evidence from Venture and Nonventure Capital-Backed Companies", The Journal of Finance Vol. 52, 1791-1821

Brennan, M.J., and Franks, J., 1997. "Underpricing, ownership and control in initial public offerings of equity securities in the U.K", Journal of Financial Economics Vol. 45, 391–413.

Buchner, A., Mohamed, A., Wagner, N., 2019. "Are venture capital and buyout backed IPOs any different?", Journal of International Financial Markets, Institutions & Money Vol. 60, 39-49

Cao, J., and Lerner, J., 2009. "The performance of reverse leveraged buyouts", Journal of Financial Economics Vol. 91, 139-157

Carter, R.B., 1992. "Underwriter Reputation and Repetitive Public Offerings", The Journal of Financial Research Vol. 15, 341-354

Carter, R.B., Dark, F.H., and Sapp, T.R.A., 2010. "Underwriter reputation and IPO issuer alignment 1981-2005", The Quarterly Review of Economics and Finance Vol. 50, 443-455

Carter, R.B., Dark, F.H., and Singh, A.K., 1998. "Underwriter Reputation, Initial Returns, and the Long-Run Performance of IPO Stocks", The Journal of Finance Vol. 53, 285-311

Carter, R.B., and Manaster, S., 1990. "Initial Public Offerings and Underwriter Reputation", The Journal of Finance Vol. 45, 1045-1067

Cassia, L., Giudici, G., Paleari, S., and Redondi, R., 2004. "IPO Underpricing in Italy", Applied Financial Economics Vol. 14, 179-194

Cattaneo, M., Meoli, M., and Vismara, S., 2015. "Financial regulation and IPOs: Evidence from the history of the Italian stock market", Journal of Corporate Finance Vol. 31, 116-131

Chang, S.C., Chung, T.Y., and Lin, W.C., 2010. "Underwriter reputation, earnings management and the long-run performance of initial public offerings", Accounting and Finance Vol. 50, 53-78

Dell'Acqua, A., Etro, L.L., Teti, E., and Murri, M., 2015. "IPO underpricing and aftermarket performance in Italy", Journal of Economics and Financial Studies Vol. 03, 1-14

Dong, M., Michel, J.S., and Pandes, J.A., 2011. "Underwriter Quality and Long-Run IPO Performance", Financial Management Vol. 40, 219-251

Ferretti, R., and Meles, A., 2011. "Underpricing, wealth loss for pre-existing shareholders and the cost of going public: the role of private equity backing in Italian IPOs", Venture Capital Vol. 13, 23-47

Gompers, P.A., 1996. "Grandstanding in the venture capital industry", Journal of Financial Economics Vol. 42, 133-156

Hanley, K.W., 1993. "The underpricing of initial public offerings and the partial adjustment phenomenon", Journal of Financial Economics Vol. 34, 231-250

Hensler, D.A., 1995. "Litigation costs and the underpricing of initial public offerings", Managerial and Decision Economics Vol. 16, 111–128.

Hughes, P.J., and Thakor, A.V., 1992. "Litigation risk, intermediation, and the underpricing of initial public offerings", Review of Financial Studies Vol. 5, 709–742.

Ibbotson, R.G., 1975. "Price Performance of Common Stock New Issues", Journal of Financial Economics Vol. 2, 235-272

Ibbotson, R.G., and Jaffe, J.F., 1975. ""Hot Issue" Market", The Journal of Finance Vol. 30, 1027-1042

Jain, B.A., and Kini, O., 1994. "The Post-Issue Operating Performance of IPO Firms", The Journal of Finance Vol. 49, 1966-1726

Kaplan, S., 1989. "The Effects of Management Buyouts on Operations and Value", Journal of Financial Economics Vol. 24, 217-254

Katz, S.P., 2009. "Earnings Quality and Ownership Structure: The Role of Private Equity Sponsors", The Accounting Review Vol. 84, 623-358

Levis, M., 2010. "The Performance of Private Equity-Backed IPOs", Financial Management Vol. 40, 253-277

Ljungqvist, A., Nanda, V., and Singh, R., 2006. "Hot markets, investor sentiment, and IPO pricing", The Journal of Business Vol. 79, 1667-1702

Loughran, T., and Ritter, J.R., 1995. "The New Issue Puzzle", The Journal of Finance Vol. 50, 23-51

Loughran, T., and Ritter, J.R., 2000, "Uniformly Least Powerful Tests of Market Efficiency", Journal of Financial Economics Vol. 55, 361-389.

Loughran, T., and Ritter, J.R., 2002. "Why Don't Issuers Get Upset about Leaving Money on the Table in IPOs?", The Review of Financial Studies Vol. 15, 413-443

Loughran, T., and Ritter, J.R., 2004. "Why Has IPO Underpricing Changed Over Time?", Financial Management Vol. 33, 1-34

Megginson, W.L., and Weiss, K.A., 1991. "Venture Capitalist Certification in Initial Public Offerings", The Journal of Finance Vol. 46, 879-903

Meles, A., 2011. "Do private equity investors create value for Italian initial public offerings?", International Review of Finance Vol. 13, 391-416

Modigliani, F., and Miller, M.H., 1963. "Corporate Income Taxes and the Cost of Capital: A Correction", American Economic Review Vol. 53, 433-443

Paleari, S., and Vismara, S., 2007. "Over-optimism when pricing IPOs", Managerial Finance Vol. 33, 352-367

Pennacchio, L., 2014. "The causal effect of venture capital backing on the underpricing of Italian initial public offerings", Venture Capital Vol. 16, 131-155

Pham, P.K., 2008. "Pre-IPO Ownership Structure and Its Impact on the IPO Process", Journal of Banking and Finance Vol. 32, 2361-2375

Purnanandam, A.K., Swaminathan, B., 2004. "Are IPOs Really Underpriced?", Review of Financial Studies Vol. 17, 811-848

Ritter, J.R., 1991. "The Long-Run Performance of Initial Public Offerings", The Journal of Finance Vol. 46, 3-27

Ritter, J.R., 2011. "Equilibrium in the Initial Public Offering Market", Annual Review of Financial Economics Vol. 3, 347-374

Ritter, J.R., and Welch, I., 2002. "A Review of IPO Activity, Pricing, and Allocations", The Journal of Finance Vol. 57, 1795-1828

Rock, K., 1985. "Why New Issues are Underpriced", Journal of Financial Economics Vol. 15, 187-212

Rossi, F., 2012. "The long-run performance of IPOs in Italy: a comparison of venture and non-venture-backed companies", Chinese Business Review Vol. 11, 691-705

Ruud, J.S., 1993. "Underwriter price support and the IPO underpricing puzzle", Journal of Financial Economics Vol. 34, 135–151.

Rydqvist, K., 1997. "IPO underpricing as tax-efficient compensation", Journal of Banking and Finance Vol. 21, 295–313.

Schuster, J.A., 2003. "IPOs: Insights from Seven European Countries", Discussion paper (461). Financial Markets Group, London School of Economics and Political Science, London, UK.

Seguin, P.J., and Smoller, M.M., 1996. "Share Price and Mortality: An Empirical Evaluation of Newly Listed Nasdaq Stocks", Journal of Financial Economics Vol. 45, 333-363

Stoughton, N.M., and Zechner, J., 1998. "IPO mechanisms, monitoring and ownership structure", Journal of Financial Economics Vol. 49, 45–78.

Taranto, M., 2003. "Employee stock options and the underpricing of initial public offerings", Working Paper, University of Pennsylvania (unpublished).

Tinic, S.M., 1988. "Anatomy of initial public offerings of common stock", Journal of Finance Vol. 43, 789–822

Viviani, D., Giorgino, M., and Steri, R., 2008. "Private Equity-Backed IPOs and Long-Run Market Performance Analysis of Italian Firms", The Journal of Private Equity Vol. 11, 50-60

Welch, I., 1989. "Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings", The Journal of Finance Vol 44, 421-449

Welch, I., 1992. "Sequential Sales, Learning, and Cascades", The Journal of Finance Vol. 47, 695-732

Appendix

Appendix 1 – Sample description, number of observations

Reputation Eq-Weighted	Number	Percentage
High Reputation	86	77%
Low Reputation	25	23%
Total	111	100%

Reputation Pr-Weighted	Number	Percentage
High Reputation	70	63%
Low Reputation	41	37%
Total	111	100%

PE-Backing	Number	Percentage
PE-backed	22	20%
Non-backed	89	80%
Total	111	100%

Appendix 2 – Number of IPOs in each sector

Sector	Number	Percentage
Communication Services	18	16%
Consumer Discretionary	26	23%
Consumer Staples	7	6%
Energy	3	3%
Health Care	6	5%
Industrials	26	23%
Information Technology	15	14%
Materials	2	2%
Utilities	8	7%
Total	111	100%