UNIVERSITY OF CATANIA

DOTTORATO DI RICERCA IN ECONOMIA AZIENDALE

The impact of ownership and advisors on IPO and post-IPO performance

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PHD THESIS

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Academic Year 2012-2013

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INTRODUCTION

1. SETTING THE SCENE AND STATING THE PROBLEMS

Initial public offering (IPO) is one of the most sensitive events a firm can incur during its life. With this decision, a firm decides to move from the private to the public domain. This is one of the moments where the firm receives much attention, since this is generally the first time that specific and sensitive information are made publicly available. Scholars, mainly in the field of finance, have devoted much of their work to this phenomenon (Ritter, 1998; Chemmanur and Fulghieri, 1999; Ritter and Welch, 2002; Daily et al., 2003). One of the dominant theoretical perspectives applied to IPO is the signaling theory. Since the transformation of a firm from private to public is a moment characterized by significant information asymmetries (Baron, 1982; Beatty and Ritter 1986; Rock, 1986; Chemmanur, 1993), this theory suggests to overcome this situation by relying on certain variables or indicators able to send signals to the market about firm's capabilities and value. Many signals have been analyzed in literature and the debate is still actual, since scholars constantly discuss on their validity (Brau and Fawcett, 2006; Brau and Johnson, 2009; Pollock et al., 2010).

At the time of IPO, a key issue is the choice of the advisory team, namely underwriting bank and auditor, as their presence acts as a signal and can have an impact on firms' performance. Literature has shown that also other players can be crucial for firms' performance, mainly private equity investors and firms' owners. Another dominant theory in the IPO context is the agency theory (Jensen and Meckling, 1976), used to analyze issues associated with the separation of ownership and control subsequent to the going public decision. Through an IPO, firms usually issue new shares to sell to market investors and existing shareholders may also sell part or all of their shares. Following this event, new, outside shareholders enter the firm and ownership gets fragmented. This separation from ownership and control reduces managers' and founders' incentives to act in the interest of the firm and may bring to a reduction in firm's profitability.

This dissertation focuses on the impact that these players have on IPO and post-IPO performance in a bank-oriented system such as Italy.

Previous research has focused its attention on market-oriented systems such as the Anglo-Saxon markets, namely the US and the UK. The Italian context is very different in terms of size, actors and composition. For example, the Italian private equity and venture capital market is a

young and small market, and only little empirical work is available to date. As a consequence, little information exists about these firms, their investments and divestment activities. Thus, among the objectives of this dissertation, there is to enlarge the level of knowledge with respect to IPOs' players and to compare these results with those of international studies. In particular, we question the ability of the Italian market to correctly evaluate IPOs. The Italian economy is an economy in which financial markets have very limited importance, while financial intermediaries such as banks, pension funds and insurance companies are dominant and banking relationships assume great importance. Conversely, the Anglo-Saxon economy is an economy in which financial markets are dominant and financial intermediaries are less important. In addition, most of the Italian firms are family-owned and are characterized by an absence of separation between ownership and control at the time of the offering. For the majority of Italian newly public firms this is the first time they can incur in agency costs. Gangi (2008) finds that IPOs bring major changes in top management and significantly greater separation of ownership and control.

The signaling and agency theories have been developed and mainly tested in the US contest, but international evidence emphasizes the importance of examining standard theories within alternative institutional environments (Elston and Yang, 2010).

This dissertation adds new evidence to the debate surrounding the importance of considering institutional settings when generalizing theories. The chosen field of analysis is the Italian market, which is of special interest due to the above-mentioned important differences with respect to the United States.

2. OBJECT AND STRUCTURE OF THE DISSERTATION

This dissertation lies in the field of finance with the object to analyze the impact of ownership and advisory team on IPO and post-IPO performance in a bank-oriented system like Italy. Two main theories are applied, the signal and the agency theory, and four players are analyzed, private equity firms, underwriters, auditors and top shareholders. To address the research question, this dissertation is organized into three chapters:

1. Chapter I: "The Impact of Third-Party Certification on Italian Initial Public Offerings";
2. Chapter II: "Lending Relationship and the Role of the Underwriter: Evidence from Italian IPOs";

3. Chapter III: “Ownership Pre- and Post-IPOs and Operating Performance of Italian Firms”.

Nevertheless, the research has been conducted in a way that each chapter represents a complete essay in its own right. The following section presents the research perspective, methods and structure of each of the chapters.

2.1. Chapter I: The Impact of Third-Party Certification on Italian Initial Public Offerings

Chapter one explores the role of private equity firms, underwriters and auditors in certifying the quality of a firm when going public. Previous literature has shown that venture capital-backing and the association with prestigious venture capitalists, underwriters and auditors are important signals of the quality of a firm at IPO and the association with these players can help reducing information asymmetries and uncertainty surrounding this event (Beatty and Ritter, 1986; Titman and Trueman, 1986; Balvers et al. 1988; Barry et al., 1990; Carter and Manaster, 1990; Megginson and Weiss, 1991; Lin and Smith, 1998). The signaling theory is one of the dominant theoretical perspectives developed to resolve the information asymmetry problem and suggests that firms can rely on signals to convey information about their quality to outside, uninformed investors (Daily et al., 2003). In this respect, the association with third-party certifiers is one of the main signals firms can rely on. We test the validity of the certification hypothesis on a sample of all IPOs on the Italian Stock Exchange over the decade 2003-2012. . This period allows to isolate the effects deriving from the “bubble” years (1999-2000) and its consequences (2001-2002). The sample is made of 98 IPOs, out of which 37 are private equity (PE) backed. This chapter mainly focuses on the reputation of third-party certifiers and different OLS regression analyses are run for whether: (i) the firm is PE-backed; (ii) the firm is backed by a prestigious private equity firm; (iii) the firm is advised by a prestigious underwriter; (iv) the firm is audited by a prestigious auditor. Measuring reputation is one of the key issues of this chapter as this is the first attempt on the Italian market. For this reason we appeal to indicators commonly used in the academic literature: an index constructed as the average standardized value of the age of the private equity firm and the number of deals involved in as lead over the 10 years of the study for private equity firms’,

market share for underwriters', and a dummy variable if the audit firm is a Big-Four[1] for auditors' reputation. The impact of these players is analyzed in terms of IPO performance. IPO performance can be measured in different ways. The dominant indicator, used in much IPO research, is underpricing (Ritter, 1998; Daily et al., 2003), which is the difference between the offering price and the first trading day close price. Previous works noted that firms accept to discount their share price at IPO in order to signal their quality and attract interests of investors (e.g., Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989). Firms can reduce the amount of underpricing at the time of IPO using third-party certifiers, such as venture capitalists, underwriters and auditors. IPO performance is also studied through another measure that has received less attention in the past: the opportunity cost of issuance (OCI). Underpricing can mislead the issuance cost of an IPO, since it does not take into account the number of shares offered to the public. What really matters is the "money left on the table" concerning preexisting shareholders (Barry, 1989; Habib and Ljungqvist, 2001; Franzke, 2004; Dolvin and Jordan, 2008; Hsu et al., 2012). What OCI takes into consideration is wealth losses rather than initial returns (Habib and Ljungqvist, 2001), considering both the effect of underpricing on the existing shares sold from shareholders at IPO and the cost of dilution associated with the newly issued shares.

Testing the certification hypothesis on the Italian market, we find that PE-backed firms and firms backed by more reputable private equity firms and underwriters are not better off than others. Only association with Big-Four auditors helps issuing firms in reducing underpricing and wealth loss for pre-existing shareholders when going public, evidencing that, at least in the Italian market, Big-Four accounting firms' reputation is relevant to solving asymmetric information problems. The research contributes to the understanding of this phenomenon in bank-oriented countries and enhances the understanding of the European environment. The issue that private equity firm's and underwriter's certification effect does not hold in the Italian market is very important because it shows that the underdevelopment of stock market is a weakness for the economy and a limit for firms' profitability. In the young Italian financial market, investors are not able to fully recognize the value-added and certification role of private equity firms and underwriters.

Table 1 presents an overview of chapter one.

1 The Big Four are the four largest international audit firms, namely PricewaterhouseCoopers, Deloitte Touche Tohmatsu Limited, Ernst & Young and KPMG.

Table 1: Overview of Chapter I

Purpose	To investigate the impact of third-party certifiers on Italian firms' IPO performance
Theoretical perspective	Signaling theory
Research question	- Is firms' IPO performance, in terms of underpricing and opportunity cost of issuance, influenced by the presence of private equity firms? - Does private equity firms', underwriters' and auditors' reputation affect IPO performance?
Method	Econometric method, OLS regression model
Sample	98 firms which went public over the decade 2003-2012
Findings	- The findings validate the certification theory only for IPOs audited by Big-Four accounting firms - Aside from this, there is no significant difference between the certification effect of PE-backed firms and non PE-backed firms, between firms backed by reputable private equity firms and other firms, and between firms which hire reputable underwriters and firms which don't
Research limitations	- Empirical setting comprises only one country - Necessity of extending the investigation to a larger number of firms, especially when referring to private equity reputation (37 firms)
Main contribution/Originality	- It is the first attempt to analyze the effect of reputation on IPO

	performance on the Italian market - It enhances the understanding of the European environment - It contributes to the understanding of IPOs in bank-oriented countries - It shows that underdevelopment of stock market is a weakness for the economy and a limit for firms' profitability. In the young Italian financial market, investors are not able to fully recognize the value-added and certification role of private equity firms and underwriters

2.1.1. Chapter II: Lending Relationship and the Role of the Underwriter: Evidence from Italian IPOs

Chapter two investigates whether and how the existence of a prior lending relationship with the IPO underwriting bank ameliorate or worsen information asymmetries, affecting the firm's IPO and post-IPO performance in the Italian market. Studying the event through the lens of the signaling theory, when the relationship between a firm and its lending bank extends to underwriting activities it can lead to two opposing effects: certification or conflict of interest. Thus, the chapter juxtaposes and studies these two hypotheses on firms' IPO and post-IPO performance. On one side, a strand of the finance literature shows that lending relationships can reduce the problem of asymmetric information between the firm and the market (the certification hypothesis) (Petersen and Rajan, 1994; Boot, 2000). On the opposite side, there is a large and growing literature on conflicts of interest in financial institutions, related to incentives banks can have in using private information gained through their lending activities for their personal profit (the conflict of interest hypothesis) (Mehran and Stulz, 2007). We test these hypotheses over a unique hand-collected database of all IPOs filed on the Italian Stock Exchange over the period 2003-2009 and analyze their impact on four indicators of IPO and post-IPO performance: underpricing and price revision on one side, and market-to-book ratio at 2 and 4 years after the IPO on the other side. While underpricing is the dominant indicator of IPO performance in literature (Ritter, 1998; Daily et al., 2003), price revision is the revision in the offer price from the midpoint of the filing range and depends on investors' demand generated during the book building period. This mechanism is usually chosen by underwriters to reduce the information asymmetries surrounding the IPO and stimulate investors to disclose information (Benveniste and Spindt, 1989).

The long-run analysis is driven by the proof that pre-IPO lending relationships may affect post-IPO performance (Gonzalez and James, 2007). Following literature, we employ the market-to-book ratio (Yermack, 1996; La Porta et al., 2002). The sample is made of 58 IPOs, out of which 32 have lending relationships. The examination period has been chosen in order to isolate the "bubble" years (1999-2000) and its subsequent effects (2001-2002), and to have market and accounting data for the analysis of post-IPO performance.

The findings from the Italian market are twofold:

- in the short run, results support a prominence of the certification hypothesis, as investors require smaller underpricing for IPOs with lending relationships;
- in the long run, the conflict of interest effect prevails and stock performance shows a

negative relationship with the lending relationship.

The results question the ability of the Italian market to correctly evaluate IPOs. Underwriters have incentives in bringing low-value clients to the market and use private information gained through their lending activities for their personal profit. Such actions bear indirect costs, including reputation costs, which don't deter banks from doing so, probably because banks know that Italian investors are still naïve and don't perceive the risk. Therefore, the existence of pre-IPO lending relationships between the underwriter and the firm creates moral hazard problems between the underwriter and outside investors, which are fooled and buy overpriced issues. The evidence that investors wrongly require lower underpricing (pay higher price) for issues underwritten by lending banks and these stocks perform worse than others in the long run reveals the poor efficiency of the Italian market.

Table 2 presents an overview of chapter two.

Table 2: Overview of Chapter II

Purpose	To investigate whether and how the existence of prior lending relationship with the IPO underwriting bank ameliorates or worsens information asymmetries in the Italian market
Theoretical perspective	Signaling theory, under the certification and the conflict of interest hypotheses
Research question	- Does the existence of a lending relationship with the IPO underwriter affect the firm's IPO and post-IPO performance?
Method	Econometric method, OLS regression model
Sample	58 firms which went public over the period 2003-2009
Findings	The findings of this chapter are twofold: - at the time of IPO, investors rely on the certification role of the lending bank and require lower underpricing, validating the certification theory; - in the long run, the conflict of interest effect prevails and the market-to-book ratios show negative relationship with the lending relationship
Research limitations	- Empirical setting comprises only one country - Necessity of extending the investigation to a larger number of firms (only 32 firms with lending relationship)
Main contribution/Originality	- It is the first study to investigate the certification and conflict of interest hypotheses when the IPO underwriter

	has prior lending relationships with the issuer in the Italian market - We aim to contribute to the understanding of this phenomenon in bank-oriented countries and enhancing the understanding of the European environment - It confirms that underdevelopment of stock market is a weakness for the economy and a limit for firms' profitability. In the young Italian financial market, investors are not able to fully understand and evaluate the role carried out by underwriters - This inefficiency favors shareholders selling shares at IPO and underwriting banks. Market investors, instead, suffer twice: at the time of IPO, when buying overpriced shares, and in the future, when share prices drop

2.2. Chapter III: Ownership Pre- and Post-IPOs and Operating Performance of Italian Firms

Chapter three focuses on the deterioration in operating performance subsequent to IPOs. Evidence shows that firms that have gone public usually exhibit a decline in operating performance (Jain and Kini, 1994; Cai and Wei, 1997; Mikkelson et al., 1997; Pagano et al., 1998). One of the dominant theories used to explain this phenomenon is the agency theory (Jensen and Meckling, 1976). The decision of a firm to go public brings some issues associated with the separation of ownership and control, which is closely related to the principal-agent problem and the agency theory. During an IPO, owners and managers usually sell (some of) their shares to the public, in order to monetize (part of) their investment. This brings to an ownership dilution and the entrance of outside, small shareholders in the firm. While, before the IPO, the firm is owned and controlled by few shareholders, who have big incentives in monitoring managers and managing the firm properly, the entrance of new minority shareholders in the firm after the IPO reduces pre-existing shareholders' incentives to monitor. This misalignment of interests increases managers' incentives in appropriating part of the firm resources for their own consumptions, in the form of perquisites, and reduces managers' incentives to devote significant effort in new, risky and time-consuming activities. The sell of shares reduces incentives for managers and owners (Jensen and Meckling, 1976). Another stream of research questions the certification and the value-added functions of venture capital backing on post-IPO operating performance, as the certification role fulfilled by venture capital firms reduces agency costs and conflicts of interests between principals and agents (Jain and Kini, 1995). In this chapter, we examine the effect of ownership on operating performance on a sample of Italian firms listed on the Italian Stock Exchange over the period 2003-2009. Two major dimensions of ownership are taken into consideration: a quantitative one, indicating ownership concentration and represented by the stake held by top shareholders, and a qualitative one, about the type of shareholder and relative to the presence of private equity firm both before and after the IPO. The main hypotheses question if there are positive relationships between operating performance and the following dimensions: (i) the stake held by top 3 shareholders before IPO; (ii) its change following IPO; (iii) the presence of private equity firm before IPO; (iv) the presence of private equity firm after IPO.

The analysis is conducted over three operating performances that have received much attention in the literature: EBITDA margin, ROA and sales growth (Cai and Wei, 1997; Kutsuna

et al., 2002; Meles et al., 2014). We distinguish two different periods: the pre-IPO years, from three years before IPO to the year before IPO (Year -3, -2, and -1), and the post-IPO years, from the year of IPO to three years after IPO (Year 0, +1, +2, and +3). We perform two econometric analyses, the first one over the years before IPO and the second one comparing the changes recorded in the two periods, the pre- and post-IPO years.

The findings of this chapter are twofold:

- before the IPO we find support for the agency theory and the ownership hypothesis;
- the post-IPO analysis does not confirm the hypotheses, although, descriptively, the hypothesized relationships have been confirmed.

In summary, the hypotheses that ownership concentration and structure (private equity presence) influence operating performance is verified for the years before the IPO, but it cannot be generalized for the years subsequent the listing. This is an interesting finding of the paper, which should need further investigation.

Table 3 presents an overview of chapter three.

Table 3: Overview of Chapter III

Purpose	To investigate whether the deterioration in operating performance after an IPO is explained by the change in ownership in the Italian market
Theoretical perspective	Agency theory
Research question	- Is the decline in operating performance subsequent to an IPO explained by the ownership structure? - Is pre-IPO operating performance explained by firm's ownership structure?
Method	Econometric method, OLS regression model
Sample	58 firms which went public over the period 2003-2009
Findings	The findings of this chapter are twofold: - the analysis conducted before the IPO finds support for the agency theory and the ownership hypothesis - the analysis comparing the changes recorded in the two periods, the pre- and post-IPO years, does not confirm the hypotheses, although, descriptively, the hypothesized relationships have been confirmed
Research limitations	- Empirical setting comprises only one country - Two previous researches on the Italian market go in a similar direction
Main contribution/Originality	- The sample analyzed shows the absence of a non-linear relationship as, instead, stated in a previous research by Bonardo et al. (2007)

	- Two different analyses are performed, one over the years before the listing and another one over the change reported due to the listing - It is the first study to analyze the relation between ownership and operating performance before IPO in the Italian market - It emphasizes the importance of examining standard theories within alternative institutional environments

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CHAPTER I

THE IMPACT OF THIRD-PARTY CERTIFICATION ON ITALIAN INITIAL PUBLIC OFFERINGS

ABSTRACT

Firms undergoing an IPO can use third-party certification to reduce information asymmetries and uncertainty. In this paper, we identify private equity firms, underwriting banks and auditors as third-party certifiers. Previous literature has shown that venture capital backing and the association with prestigious venture capitalists, underwriters and auditors are important signals of the quality of a firm at IPO. We test the certification hypothesis on the Italian market and provide evidence to the contrary: private equity-backed firms and firms backed by more reputable private equity firms and underwriters are not better off than others. Only association with Big-Four auditors helps issuing firms in reducing underpricing and wealth loss for pre-existing shareholders when going public.

1. INTRODUCTION

The transformation of a firm from private to public is a moment characterized by significant information asymmetries (Baron, 1982; Beatty and Ritter 1986; Rock, 1986; Chemmanur, 1993). One of the mechanisms used to overcome this situation is to rely on certain type of signals in order to highlight the quality of the firm. Signals can be either internal (Leland and Pyle, 1977; Downes and Heinkel, 1982; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989; Chemmanur, 1993) or external to the firm. Among external signals, one that has received much attention is the certification role fulfilled by third-party players, namely private equity firms, underwriters and auditors, in assessing the quality of the issuing firm. A survey of 336 chief financial officers (CFOs) conducted in the U.S. shows that certification is perceived as a very strong positive signal during IPOs. CFOs elected a prestigious underwriter as the most credible partner, followed by a Big-Four accounting firm and the backing of a venture capital firm (Brau and Fawcett, 2006). Literature shows that these actors can help mitigating these problems, through their expertise and reputation (Booth and Smith, 1986; Weigelt and Camerer, 1988; Higgins and Gulati, 2003; Rindova et al., 2005; Pollock et al., 2010). A group of researchers shows that affiliations with private equity

firms can reduce information asymmetry and, consequently, underpricing at IPO (Barry et al., 1990; Megginson and Weiss, 1991; Wang et al., 2003). Another stream of research goes beyond the simple presence or absence of private equity firm and investigates the impact of private equity reputation (Lin and Smith, 1998; Stuart et al., 1999; Pollock et al., 2010). Another group of authors analyzes the importance of underwriters' reputation on IPO performance (Beatty and Ritter, 1986; Booth and Smith, 1986; Carter and Manaster, 1990). Lastly, some authors have focused their attention on the importance of auditors in reducing IPO underpricing (Titman and Trueman, 1986; Balvers et al., 1988; Beatty, 1989).

These three players, given their role of repeated actors in the market, put their reputational capital at stake and so they use their reputation as an instrument to certify the quality of the firms on financial markets in the course of an IPO. Hence, if investors adequately take the role of private equity firms, underwriters and auditors into account, reputation should have an effect on issuing firms' IPO prices.

Taking this as our starting point, we investigate the impact of private equity firms, underwriters and auditors on underpricing and opportunity cost of issuance in the Italian IPO market. The first dependent variable represents the first-day return of an issue, while the latter represents the money left on the table by existing shareholders, hence their wealth losses. While the majority of the researches focus on underpricing, they omit to study the wealth loss for preexisting shareholders, which is represented by the opportunity cost of issuance. If underpricing is high but the amount of shares sold is low, the wealth loss would be minimal. Opportunity cost of issuance computes both the effect of underpricing on the existing shares sold from shareholders at IPO and the cost of dilution associated with the new issued shares.

Since the Italian financial market, in general, and the private equity and venture capital market, in particular, are young and small markets, only little empirical work is available to date. A work of Ferretti and Meles (2011) highlights that only firms backed by a syndication of private equity firms show lower underpricing and opportunity cost of issuance at IPO. When looking at equity valuation instead of underpricing, Meles (2011) finds that PE-backed IPOs register higher valuation, which is consistent with the certification hypothesis, although he

suggests that it might be more consistent with the market power hypothesis[2], since higher valuation persists in the secondary market.

Apart from the Ferretti and Meles (2011) research which is the first to study the impact of private equity backing on underpricing and the cost of going public, this is the first attempt to analyze the effect of reputation on IPO performance on the Italian market. For reputation we have used proxies commonly used in the academic literature: an index which includes age and number of deals for private equity firms (Gompers, 1996; Lin and Smith, 1998; De Clercq and Dimov, 2012), market shares for underwriters (Megginson and Weiss, 1991; Dunbar, 2000; Aussenegg et al., 2006; Chemmanur and Krishnan, 2012; Boreiko and Lombardo, 2013), and a dummy variable that equals one if the firm is a Big-Four accounting firm for auditors (Balvers et al., 1988; Beatty, 1989; Michaely and Shaw, 1995; Hogan, 1997; Firth and Liau-Tan, 1998).

The findings of this paper validate the certification theory only for IPOs audited by Big-Four accounting firms. Only association with Big-Four auditors helps issuing firms in reducing underpricing and wealth loss for pre-existing shareholders at IPO. Aside from this, we find that there is no significant difference between the certification effect of PE-backed firms and non PE-backed firms, between firms backed by reputable private equity firms and other firms, and between firms that hire reputable underwriters and firms that don't. This phenomenon is in line with evidence from other European countries and cannot be explained following the certification phenomenon but needs further investigation.

The remainder of the paper is organized as follows: Section 2 presents literature about the certification role of private equity firms, underwriters and auditors. Section 3 describes data, sample construction procedures, variable definitions and the methodological approach. Section 4 reports the results, Section 5 describes the main results and Section 6 concludes the paper.

2. THEORETICAL BACKGROUND AND HYPOTHESES

For more than a century, formal economic models of decision-making processes were based on the assumption of perfect information, assuming that markets with minor information imperfections would behave like markets with perfect information (Stiglitz, 2002). One of the most important breaks with the past is represented by the economics of information, where

2 The market power hypothesis postulates that private equity firms are able to attract a greater number of higher quality market participants (such as institutional investors, analysts, and co-managing underwriters) to IPOs backed by them, thereby yielding higher IPO valuations by increasing the heterogeneity in investor beliefs.

information plays an important role in agents' decisions. Information economics recognizes that information is imperfect, can be costly, and that there are important asymmetries of information (Stiglitz, 2000). The problem of asymmetric information and quality uncertainty is particularly pronounced in financial markets. In a transaction, an agent who has private information that can affect the other agent's decision, might try to take full advantage of the potential gains involved (Riley, 2001). A number of scholars devoted their academic work in understanding how asymmetric information influences decision-making processes and Akerlof, Spence and Stiglitz received the 2001 Nobel Prize in Economics for their work on information economics. In particular, Akerlof (1970), using the automobiles market, called it the "lemons" problem. Transposing it to the financial market it assumes that, in a market affected by information asymmetry, only low-quality issuers are willing to sell their shares at the average price, while high-quality issuers deliberately sell their shares at a lower price in order to signal their quality. High-quality issuers know that they can recover from their IPO sacrifice, the "money left on the table", after the IPO, when the market will be able to discriminate higher quality from lower quality public firms. This mechanism deters low-quality issuers from imitating (Welch, 1989). Two theories have been developed to resolve the information asymmetry problem: screening and signaling. In a deal between two parties, while the screening theory implies that the uninformed agent screens the informed agent to learn as much as it can about the latter, the signaling theory assumes that the informed party moves first, using signals to convey information to the uninformed agent, in order to reduce information asymmetries and uncertainty.

In financial markets, signals are usually used to highlight the quality of a firm, which will reflect in its market valuation. For publicly traded firms signaling has then an impact on stock prices (Riley, 2001). In this respect, previous research on the determination of equity values has shown the decreasing importance of financial information and the increasing relevance of nonfinancial information (Amir and Lev, 1996; Lev and Zarowin, 1999).

The transformation of a venture from private to public is a moment characterized by significant information asymmetries (Baron, 1982; Beatty and Ritter 1986; Rock, 1986; Chemmanur, 1993). Kim and Ritter (1999) have found the relationship between financial information and equity values in the IPO contest very weak. One tool available to firms is the use of a reliable signaling system, which enables investors to distinguish between poor quality and high quality IPOs. Many researchers have proposed that signaling can reduce the problem of asymmetric information for outside investors (see, among others, Leland and Pyle, 1977;

Downes and Heinkel, 1982; Beatty and Ritter, 1986; Megginson and Weiss, 1991). Many have presented signaling models where firms unilaterally disclose their private information (Leland and Pyle, 1977; Downes and Heinkel, 1982; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989; Chemmanur, 1993). Leland and Pyle (1977) develop a model where the extent of ownership is seen as a signal to overcome the information problem and increase the value of the firm. Downes and Heinkel (1982) test both the Leland and Pyle model (retained ownership) and the Battacharya and Heinkel models (dividend declaration) and find support for the former but reject the dividend-signaling hypothesis. Allen and Faulhaber (1989) and Welch (1989) develop signaling models where valuable firms underprice their initial offer price when going public. Supporting the underpricing signal, Ibbotson et al. (1988) present a review of new issues that result in significant underpricing. Grinblatt and Hwang (1989) present an incremental model with the percentage of the new issue retained by the issuer as an additional signal to the degree of underpricing.

Nevertheless, signals from insiders can be weak. Since insiders do not sell securities often, most likely only at the time of the offering and maybe far in the future, they have everything to gain and little to lose from signaling falsely when going public. While disclosure regulation, such as the Securities Act of 1933 in the US, deters false or misleading information and material omissions (Tiniç, 1988), it is unlikely to be completely effective in forcing disclosure of all relevant information. Therefore, in the absence of effective signaling mechanisms in IPOs, outside investors are likely to be convinced that accurate information disclosure may occur only if a third party, with reputational capital at stake, certifies so and will be negatively affected if that claim turns out to be false.

Booth and Smith (1986) are the first to apply the certification hypothesis in the context of financial markets and intermediaries. Certification refers to the ability of third parties to reduce the quality uncertainty that surrounds parties associated with them. The core of this ability lies in the reputation that these third parties have built over time, which can be used to infer the unobservable quality of a firm (Weigelt and Camerer, 1988; Higgins and Gulati, 2003; Rindova et al., 2005; Pollock et al., 2010).

As stated by Megginson and Weiss (1990), investors have confidence in third-party certification if three tests are met. The first test requires that the certifier must risk its reputational capital; the second attests that the certifier's reputational capital must be greater than the gain obtained by certifying the false; lastly, the service of the certifier (which also includes its reputational capital) must be expensive for the issuing firm, and must be an

increasing function of the extent and potential importance of the information asymmetry regarding the firm's intrinsic value.

A large body of literature shows that affiliations with third-party certification in the IPO process (Titman and Trueman, 1986; Lin and Smith, 1998; Francis and Hasan, 2001; Schertler, 2001; Brau and Johnson, 2009; Coakley et al., 2009), in particular venture capitalists (Barry et al., 1990; Megginson and Weiss, 1991; Lin and Smith, 1998; Wang et al., 2003; Sanders and Boivie, 2004; Pollock et al., 2010), underwriters (Beatty and Ritter, 1986; Booth and Smith, 1986; Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994; Carter et al., 1998; Dunbar, 2000; Pollock et al., 2010) and auditors (Titman and Trueman, 1986; Balvers et al., 1988; Beatty, 1989; Datar et al., 1991; Firth and Smith, 1995; Michaely and Shaw, 1995; Beatty and Welch, 1996), influence perceptions of firm value. In particular, Brau and Johnson (2009) show that IPO firms select prestigious certifiers (auditors, lawyers, underwriters and venture capitalists) to signal firm quality. Certification is perceived by firms' chief financial officers (CFOs) as a very strong positive signal. The most credible partner is a prestigious underwriter, followed by a Big-Four auditor and a venture capital firm (Brau and Fawcett, 2006).

2.1.Private equity certification

The importance of reputation is well documented in many theoretical and empirical studies of venture capital and private equity (Megginson and Weiss, 1991; Gompers, 1996; Amit et al., 1998; Neus and Walz, 2005), in particular in the US contest (Barry et al. 1990; Megginson and Weiss, 1991; Lin and Smith, 1998; Stuart et al. 1999).

One of the first studies to analyze the importance of venture capital certification is that of Barry et al. (1990). Studying a comprehensive set of US venture capital (VC) backed IPOs between 1978 and 1987, the authors find that outside investors recognize venture capitalists' important monitoring and control role through lower underpricing.

Megginson and Weiss (1991) show that the presence of venture capitalists, as investors in a firm going public, certifies that the offering price of the issue reflects all available and relevant inside information. VC-backed IPOs are, then, less underpriced.

Lin (1996) shows that both the presence of venture capital firms and the lead venture capital's pre-IPO shareholding have a negative correlation with IPO underpricing.

On the basis of 2 surveys conducted in Canada to investigate the role of venture capitalists, Amit et al. (1998) support the certification role and conclude that venture capitalists exist due

to their ability to reduce market failures such as informational asymmetries and moral hazard.

Sanders and Boivie (2004) investigate the role played by corporate governance characteristics as indirect indicators to lower the risk associated with information asymmetry and uncertainty in the valuation of new firms in emerging sectors and find out that venture capital participation is positively associated with market valuations.

While one stream of research focuses on the presence or absence of venture capitalists, other studies analyze the impact of venture capitalists' reputation.

Gompers (1996) develops the hypothesis that new venture capitalists take companies public earlier in order to establish sooner a reputation and raise capital for new funds.

Reputation plays an important role during IPOs. In particular, third party certification by underwriters and venture capital reputation reduces the degree of underpricing (Lin and Smith, 1998) and increases IPO valuations (Pollock et al., 2010).

Further research shows that firms operating in uncertain contexts, such as the biotechnology industry, which have relationships with prominent strategic alliance partners and equity investors (alliance partners, venture capitalists, and investment banks) go public faster and earn higher valuations at IPO (Stuart et al., 1999). The authors also demonstrate that much of the benefit derives from the transfer of prominent affiliates' status.

Another research in the biotechnology industry shows that, when equity markets are relatively cold for new issues, young firms benefit from partnerships with prestigious venture capitalists, while when equity markets are relatively hot for new issues, those firms benefit from partnerships with prestigious underwriters (Gulati and Higgins, 2003).

Dolvin (2005) and Dolvin and Pyles (2006) find that higher quality venture capitalists provide incremental certification value relative to those of lower quality, requiring lower issuance costs and better performance at IPO.

Studying the timing of venture capital involvement, Lee et al. (2011) highlight that a high-reputation venture capitalist's early involvement has a positive effect on initial market reactions, probably due to the investors' perception that young start-ups will receive the knowledge, social capital and financial resources needed to grow and become successful public firms.

Signaling theory and venture capitalists' certification role applies also to other phases of the issuing firm (Jain and Kini, 1995; Brav and Gompers, 1997; Jain and Kini, 2000; Arikan and Capron, 2010; Reuer et al., 2012). Consistent with a reputational analysis, Jain and Kini

(1995) and Brav and Gompers (1997) find that in the long run, VC-backed IPOs show superior operating and market performance compared non-VC backed IPOs. Looking on the M&A market, Arikan and Capron (2010) show that affiliations with venture capitalists and prestigious underwriters have a positive effect when the issuing firm becomes an acquirer, while Reuer et al. (2012) argue that newly public firms benefit from associations with prominent underwriters, venture capitalists, and alliance partners when becoming targets. Pollock and Gulati (2007) analyze the influence of venture capitalist experience and underwriter prestige on the firm's ability to form post-IPO strategic alliances and find out that while the former works as a signal over the long term, the latter works only in the short term. Finally, venture capital involvement at the time of IPO improves the survival profile of public firms (Jain and Kini, 2000).

Empirical results on the impact of venture capitalists are, however, rather mixed and some show that VC-backed IPOs are actually more underpriced (Francis and Hasan 2001; Bradley and Jordan 2002). Bradley and Jordan (2002) find that, in the 1990s, VC-backed IPOs had much higher initial returns than non-VC backed, although they also find that venture capital investors tend to concentrate in industries with relatively large underpricing. After controlling for industry effects and underwrite quality, they conclude that there is no difference in underpricing between VC- and non-VC-backed issues.

Extant literature is mainly focused on the USA context, due to its representativeness in terms of IPO and financial markets. Studies that have extended the analysis to the venture capitalists' certification role in other markets and periods show mixed results.

Studying a sample of 92 VC-backed companies listed on the Singapore stock exchange from 1987 to 2001, Wang et al. (2003) find partial support to the venture capital's certification role, although they also find support to the adverse selection[3] and the grandstanding[4] models, suggesting that the effects of venture capitalists' participation are very complicated. On a sample of Australian IPOs filed between 1991 and 1999, Da Silva Rosa et al. (2003) find no statistically significant difference in the underpricing of VC-backed and non-VC backed IPOs.

Previous studies on bank-oriented systems have found weak evidence to support the certification theory. Hamao et al. (2000) use a sample of 355 Japanese IPO firms between

3 The information asymmetry between the firm and the private equity firm brings best firms to be self-funded and average firms to be funded by private equity firms because of the same pricing for all "lemons" in the private equity market. Thus, the quality of PE-backed firms is not the best and this brings to higher underpricing (Amit et al., 1990).

4 The grandstanding hypothesis suggests that VCs, particularly younger ones, may try to show off their quality by taking their portfolio companies public earlier than expected, leading to higher underpricing.

1989 and 1994 to show that the certification role holds and the issue is less underpriced, but only when the firm is not backed by a bank-controlled venture capitalist. On the opposite, when the leading venture capitalist is also the leading underwriter, IPOs do not have lower first-day returns because investors may require more underpricing to compensate for the potential conflict of interest.

In Europe results are quite mixed and show that the certification hypothesis does not hold in bank-oriented countries. In this respect, one of the main countries to have been analyzed is Germany. Franzke (2004) does not find support for the certification role of venture capitalists and underwriters. On the contrary, firms backed by a prestigious venture capitalist experience greater underpricing. Tykvovà and Walz (2007) analyze the influence of different types of venture capitalists on the performance of their portfolio firms around and after IPO and find no effects on underpricing, while their certification role holds in the post-IPO market performance. Other evidences from Germany confirm that VC-backing does not affect IPO underpricing, suggesting the importance of examining standard theories within alternative institutional environments (Elston and Yang, 2010). Finally, Schertler (2001) verifies that the presence of private equity investors does not affect underpricing in Germany and extends the evidence to France.

Klaassen and von Eije (2009) find that, between 1994 and 2005, venture capitalists had no significant effect on IPO underpricing in The Netherlands.

Chahine et al. (2007) underline the importance of the institutional context by comparing VC-backed IPOs in the UK and France in order to understand the differences between common law and civil law countries. They find out that UK VC-backed IPOs are less underpriced than non-VC backed IPOs, supporting the certification hypothesis, whereas the opposite happens in France, where venture capitalists increase underpricing, supporting the grandstanding hypothesis.

Nevertheless, results on an Anglo-Saxon country such as the UK, where the financial market is dominant, are contradictory. Coakley et al. (2009) find support for the certification role of venture capitalists and underwriters in the UK only for the pre-bubble period (1985-1997), while find an increase in the underpricing in the bubble period (1998-2000). Using a sample of 167 MBOs exiting through IPOs on the London Stock exchange, Jelic et al. (2005) find out that VC-backed MBOs are more underpriced than non-VC backed MBOs. Dell'Acqua et al. (2013), on a hand-collected dataset of 507 IPOs on the UK AIM market from 2004 to 2010,

find that venture capitalists provide a certification role when avoid moral hazard behaviors, such as grandstanding and spinning.

In the Italian market, Ferretti and Meles (2011) find out that, out of the private equity (PE) backed firms, only those backed by a syndication show lower underpricing and indirect issuance opportunity cost, while there is no difference between bank-related and non bank-related private equity investors. Conversely and looking at equity valuation, Meles (2011) finds that PE-backed IPOs register higher valuation based on their offering price, which is consistent with the certification hypothesis, although he suggests that this might be more consistent with the market power hypothesis, since higher valuation persists in the secondary market.

Venture capital is tended to be viewed narrowly as referring to new firms. In practice, the definition of "venture capital" differs in the literature. In the Anglo-Saxon meaning, venture capital indicates seed, start-up and expansion financing, while in Europe is more comprehensive and also includes later-stage venture investments.

Venture capital accounts for only about 9% of the annual value of European private equity investments, with start-up and later-stage venture investments accounting for 56% and 39% respectively (EVCA, 2012). Hence, the European definition of venture capital is broader than the American definition and, in Europe, venture capital is increasingly used in firms undergoing radical restructuring.

Unfortunately, only data on general private equity activity, which covers equity investments in all kinds of enterprises, and not data on venture capital more narrowly defined, are available for Italy. For this reason, in this study we will use the term "private equity".

Since there are two streams of research, one focusing on the presence or absence of private equity investors and the other on the reputation of private equity investors, we will test both hypotheses:

Hypothesis 1: Underpricing and opportunity cost of issuance are less pronounced for IPOs backed by private equity firms;

Hypothesis 2: The more prestigious the private equity backing the company before the IPO, the lower the underpricing and the opportunity cost of issuance.

2.2. Underwriter certification

Firms undergoing an IPO can also affiliate with prestigious third-party certifiers, such as auditors and underwriters, as a positive signal to the market. These certifiers are important to the issuing firm because possess valuable reputation capital (Dunbar, 2000). A survey of 336 CFOs about IPOs shows that the hiring of a top investment banker is the second-strongest positive signal, after a strong history of earnings. The survey emphasizes the importance of reputation and expertise in selecting the underwriter. In details, CFOs select prestigious underwriters for their reputation, their quality of research and their industry expertise, while CFOs select low-prestige underwriters when are more concerned about valuation promises and fee structure (Brau and Fawcett, 2006). A previous similar study on secondary equity offerings shows that reputation and expertise are the most-important criteria also for switching underwriter (Krigman et al., 2001).

Underwriters have a determinant role in IPO valuation because they are responsible for the decision of the issuer's offer price. Delegating the pricing decision to the investment banker can be optimal for the issuing firm, especially in the case of less sophisticated issuers, thanks to bank superior knowledge of market conditions (Baron and Holstrom, 1980).

Booth and Smith (1986) are the first to apply the certification concept in the context of financial markets and intermediaries. During an IPO, underwriters can help to reduce information asymmetries and uncertainty between market investors and the issuing firm committing their reputational capital to the quality of the issue.

Consistent with the argument that underwriters have considerable reputation capital at stake, Dunbar (2000) documents that IPO performances, in terms of underpricing and one-year abnormal performance, have a reciprocal and significant impact on investment banks' market shares.

The certification mechanism works because prestigious underwriters set strict evaluation standards when underwriting a firm. Chemmanur and Fulghieri (1994) posit the problem of moral hazard for underwriters with a very high reputation and hypothesize the existence of a U-shaped relation where evaluation standards become less strict as reputation increases. Hence, underwriters might have incentives to exploit their reputation in order to avoid the costs of strict evaluation standards.

Pollock et al. (2010) argue that different types of prestigious affiliates, namely executives, directors, venture capitalists and underwriters, convey different signals. In particular, prestigious underwriters and prestigious venture capitalists provide a certification function,

meaning that the signals provided by every additional venture capital and underwriter is redundant. Prestigious underwriters have a stronger effect than venture capitalists on IPO valuations, and the information provided by prestigious venture capitalists is more retrospective, while the one provided by prestigious underwriters is more prospective, although only over the short-term.

Titman and Trueman (1986) present a signaling model where firm value influences the choice of the underwriter and the auditor: in particular, riskier firms choose low quality underwriters or auditors. Datar et al. (1991) develop the conflicting proposition that riskier firms have greater incremental benefit from high quality auditors. A test of the competing hypotheses provides partial support to the Titman and Trueman (1986) proposition: when the IPO is filed by a low-risk issuer, the incremental benefit of hiring a prestigious auditor and underwriter is higher than the incremental cost, while when the IPO is filed by a high-risk issuer, the incremental benefit may be lower than the incremental cost (Aharony et al., 2006).

Fernando et al. (2005, 2013) reach the same conclusions of Titman and Trueman (1986) using a two-sided matching model: underwriters care about the quality of the issuers that wish to use their services, and, in the same way, issuers care about the abilities of the underwriters to hire. Higher-quality firms associate with more reputable underwriters and lower-quality firms associate with lower reputation underwriters and, especially for the first group, the reputation of the underwriters is more important than the underwriting fees.

Studies conducted in uncertain contexts, such as the biotechnology industry, show that relationships with prominent strategic alliance partners such as alliance partners and investment banks help firms going public faster and earning higher valuations at IPO (Stuart et al., 1999).

Prestigious underwriters also play an important role in influencing the amount and quality of institutional investors that decide to invest in the firm (Higgins and Gulati, 2006).

Market conditions may affect the effect of third-party certification: in particular, when equity markets are relatively hot for new issues, firms benefit from partnerships with prestigious underwriters, while when equity markets are relatively cold for new issues, young firms benefits from partnerships with prestigious venture capitalists (Gulati and Higgins, 2003).

A number of studies have examined the impact of underwriter's prestige on IPOs performance.

McDonald and Fisher (1972) are the first to hypothesize that underwriters behave differently when pricing issues.

A series of initial studies find that prestigious underwriters underprice less than non-prestigious underwriters (Logue, 1973; Neuberger and Hammond, 1974; Block and Stanley, 1980; Neuberger and La Chapelle, 1983; Balvers et al., 1988).

Beatty and Ritter (1986) develop a model with a monotone relation between the expected underpricing of an IPO and the uncertainty of market investors regarding its value and demonstrate that the resulting underpricing equilibrium is enforced by underwriters, through their reputation. In fact, underwriters risk to lose prospective investors, if the issue is overpriced, or prospective issuers, if the issue is too underpriced.

Carter and Manaster (1990) present a model where they test underwriter reputation as a signal and find that there is a significant negative relation between underwriter prestige and underpricing and that prestigious underwriters are associated with lower-risk IPOs.

Carter et al. (1998) test underwriter reputation in the short and long run and find that IPOs managed by more reputable underwriters are less underpriced and underperformance is less severe.

Drawing on social capital theory, Pollock (2004) explores how the social structure of the IPO market affects IPO performance outcomes. He finds that when demand for the offering is low, issuers benefit from underwriters' strong ties with investors and this reflects in lower underpricing, while when demand is high, buyers benefit from these relationships, reflecting in higher underpricing.

The certification hypothesis advanced previously is not without dissent.

In line with Titman and Trueman (1986), Johnson and Miller (1988) argue that the negative relationship between banker prestige and underpricing is only due to the risk of the issue: prestigious underwriters tend to associate with less risky issues. The investment banker prestige is not a significant determinant of underpricing.

While the first studies on the phenomenon showed a negative relationship between underwriter's reputation and IPO underpricing, there are a number of more recent papers that show a reverse trend, especially during the 1990s (Beatty and Welch, 1996; Loughran and Ritter, 2004; Chemmanur and Krishnan, 2012). This evidence is also consistent with the parallel debate in the venture capital literature, mentioned above (Francis and Hasan, 2001; Bradley and Jordan 2002).

Beatty and Welch (1996) find that firms with prestigious underwriters actually underprice more than firms with low-quality underwriters. Habib and Ljungqvist (2001) posit that the issuer's choice of underwriter is an endogenous process driven by the need to reduce

underpricing. Prestigious underwriters are chosen by most speculative firms, with the intent to reduce underpricing. Since these firms are riskier than regular firms, they are still more underpriced, although the difference is lower than it would have been had they chosen less prestigious underwriters. Loughran and Ritter (2004) hypothesize an agency problem between IPO firms and underwriters. One of the main issues is why underwriters give away some of their profits by underpricing. They find that underpricing has increased over time due to the eagerness of underwriters to leave money on the table and receive indirect compensation from buy-side clients (investors) willing to receive IPO allocations in return. Another reason is the increasing importance of analyst coverage which may influence underwriters to underprice more (Loughran and Ritter, 2002; Loughran and Ritter, 2004). In a recent paper, Chemmanur and Krishnan (2012) confirm that the underpricing and underwriter's reputation relationship has clearly flipped from the 1980s to the 1990s. In addiction, they contradict the certification hypothesis and find that, when pricing a new issue, underwriters tend to maximize the equity valuation, supporting the market power hypothesis. Signaling theory and underwriters' certification role applies also to the premarket activities of IPOs (Logue et al., 2002) and to other phases of the issuing firm's life (Lange et al., 2001; Pollock and Gulati, 2007; Arikan and Capron, 2010; Reuer et al., 2012).

Outside the U.S., Coakley et al. (2009) find support for the certification role of venture capitalists and underwriters in the UK only for the pre-bubble period (1985-1997), while find an increase in the underpricing in the bubble period (1998-2000).

In France, Roosenboom (2012) finds that prestigious underwriters are associated with lower underpricing, supporting the certification hypothesis, while in Germany Franzke (2004) does not find support for the certification role of underwriters.

In Japan, Hamao et al. (2000) find that when the leading underwriter is also the leading venture capitalist, investors require more underpricing to compensate for the potential conflict of interest. Also Kirkulak and Davis (2005) show that there is a positive relationship between underwriters and underpricing: more prestigious underwriters are associated with a higher level of underpricing.

On the Chinese market, Su and Bangassa (2011) find little influence of underwriter reputation on the level of underpricing, meaning that the predominance of state ownership weakens the underwriter certification role.

The lack of studies regarding the Italian market and the dissonance of results outside the US contest, in particular in Europe, provide space for more research.

Hypothesis 3: The more prestigious the underwriter appointed in the IPO, the lower the underpricing and the opportunity cost of issuance.

2.3. Auditor certification

During IPOs, auditors have to attest the validity of the financial statements in the prospectus. Auditors cover a crucial role because they are usually more actively involved with the issuer at a much earlier stage than underwriters do.

Titman and Trueman (1986) assume that riskier firms choose low quality underwriters or auditors. Datar et al. (1991) develop the conflicting proposition that riskier firms have greater incremental benefit from high quality auditors. Aharony et al. (2006) test these competing hypotheses and provide partial support to the Titman and Trueman (1986) proposition: prestigious auditors and underwriters are mainly chosen by low-risk issuers. On the contrary, empirical tests conducted outside the U.S. (in particular, Canada, New Zealand, Singapore and Australia) support the Datar et al. (1991) proposition, probably due to lower expected litigation costs against auditors (Clarkson and Simunic, 1994; Firth and Smith, 1995; Firth and Liau-Tan, 1998; Lee et al., 2003).

Balvers et al. (1998) concentrate on the interaction between the underwriter and auditor showing that prestigious underwriters tend to associate with prestigious auditors and their reputation has a negative effect on underpricing. Interestingly, they also show that the negative effects of underwriter and auditor reputation on underpricing will be less negative if both variables are high.

In addition, companies with low quality auditors shift to high quality auditors when assisted by prestigious underwriters (Menon and Williams, 1991).

Prestigious auditors are more likely to associate themselves with less risky IPOs, choosing issuers that are larger and have more tangible assets and are assisted by reputable investment bankers (Michaely and Shaw, 1995).

Following the certification theory, high-quality auditors reduce IPO underpricing (Titman and Trueman, 1986; Balvers et al., 1988; Beatty, 1989; Datar et al., 1991; Michaely and Shaw, 1995; Beatty and Welch, 1996).

Studying a sample of 1990s' IPOs, Hogan (1997) asserts that issuers select the type of auditors that minimize the sum of underpricing and auditing costs.

However, studies on the Hong Kong and Malaysian market don't support the certification hypothesis, providing evidence that investors assume that all auditing firms provide homogeneous services (Ng et al., 1994; Mohamad, 1997).
There are only few studies that test the validity of the auditors' certification role outside the US, hence a study of the Italian market can shed some light on the European contest.

Hypothesis 4: The more prestigious the auditor appointed in the IPO, the lower the underpricing and the opportunity cost of issuance.

An analysis of the Italian market is of special interest because there are important differences with respect to the United States and it is important to test the validity of the certification hypothesis in such a different market in terms of size, actors and composition.
Since the Italian private equity and venture capital market is a young and small market, only little empirical work is available to date. As a consequence, little information exists about these firms, their investments and divestment activities. Thus, among the objectives of this paper, there is to enlarge the level of knowledge with respect to IPOs' players and to compare these results with those of international studies. In particular, we question the ability of the Italian market to correctly evaluate IPOs.
The comparison between bank-oriented and market-oriented systems is of particular interest to understand the greater vitality of venture capital in the latter. A well-developed stock market, which permits venture capitalists to exit through IPOs, such as the United States, is a precondition to a substantial venture capital industry. In Italy venture capitalists exit their investments mainly through a trade sale or through the sale of their stake back to the company; exit through IPO is less developed compared to the Anglo-Saxon market (Black and Gilson, 1998).
This point is critical if one considers that previous studies on bank-oriented systems have found weak evidence to support the certification theory. The Italian economy is an economy in which financial markets have a very limited importance, while financial intermediaries such as banks, pension funds and insurance companies are dominant. Conversely, the Anglo-Saxon economy is an economy in which financial markets are dominant and financial intermediaries are less important.
In addition, in a meta-analysis study on IPO underpricing, Daily et al. (2003) review existing research and present some significant relationships, which are opposite to those predicted by the signaling and certification theory. In particular, they find out that the hypothesized negative relationships between venture capital and underpricing and auditor reputation and

underpricing are not verified, while they confirm the negative relationship between underwriter prestige and underpricing.

On top of this, another important contribution of this study is the period of analysis. By analyzing the 2003-2012 period, we will isolate the "bubble" years (1999-2000) and its subsequent effects (2001-2002). Ferretti and Meles (2011) indiscriminately cover the period 1998-2008, without distinctions.

IPO performance can be measured in different ways. The dominant indicator, used in many IPO research, is underpricing (Ritter, 1998; Daily et al., 2003), which is the difference between the offering price and the first trading day close price. Previous works noted that firms accept to discount their share price at IPO in order to signal their quality and attract interests of investors (e.g., Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989). While low-quality firms cannot bear this cost because, once their true value is revealed, they will never gain from an IPO, high-quality firm can afford this strategy because, eventually, the market will recognize their higher value. Firms can reduce the amount of underpricing at the time of IPO using third-party certifiers, such as venture capitalists, underwriters and auditors.

In addition, we will investigate the impact of insiders' reputation on another measure which has received less attention in the past: the opportunity cost of issuance (OCI). Underpricing can mislead the issuance cost of an IPO, since it does not take into account the number of shares offered to the public. What really matters is the "money left on the table" concerning preexisting shareholders (Barry, 1989; Habib and Ljungqvist, 2001; Franzke, 2004; Dolvin and Jordan, 2008; Hsu et al., 2012). What should be really computed is wealth loss rather than initial return (Habib and Ljungqvist, 2001). We will follow Barry (1989) and Dolvin and Jordan (2008) approach, which combines underpricing and share overhang (percentage of shares retained by shareholders), in order to calculate the cost of going public to preexisting shareholders. During an IPO a firm might experience a high level of underpricing, but if the amount of shares sold is small, the impact of dilution of preexisting shares will be minimal. This evidence makes OCI a better measure of shareholders' wealth loss. Dolvin and Pyles (2006) and Dolvin and Jordan (2008) find that VC-backed companies, and in particular those backed by high quality venture capitalists, are associated with a lower OCI. Ferretti and Meles (2011) find that Italian firms backed by private equity syndicates show lower underpricing and OCI.

3. DATA AND METHOD

3.1.Sample and data sources

The investigation is focused on the Italian market. We manually compiled a database of all IPOs on the Italian Stock Exchange over the decade 2003-2012. The examination period has been chosen in order to isolate the "bubble" years (1999-2000) and its subsequent effects (2001-2002). To select the sample, we excluded IPOs filed by financial institutions, by companies that were already listed on other foreign stock exchanges and by firms with incomplete information about the offer and the aftermarket. The sample is made of 98 IPOs, out of which 37 are PE-backed.

Data have been collected from several sources:

- data on the issuing characteristics from offerings prospectuses;
- data on IPOs from the Italian Stock Exchange website (http://www.borsaitaliana.it);
- stock prices from the website "Finanza Aperta" (http://www.finanza-aperta.it);
- private equity firms' age from their websites or, when not available, specialized websites.

To identify PE-backed IPOs, we have been using the records of the Italian Private Equity and Venture Capital Association (www.aifi.it).

The software used for the statistical analysis is IBM SPSS Statistics.

3.2.Underpricing and Opportunity Cost of Issuance

3.2.1. Underpricing (UP)

We calculated underpricing using the formula $(P_1 - OP)/OP$, where P_1 is the market price at the end of the first trading day and OP is the IPO offering price.

3.2.2. Opportunity Cost of Issuance (OCI)

We followed Dolvin and Jordan (2008) to calculate OCI:

$$OCI = \frac{N_{IPO}\,(P_1 - OP)}{P_1 N_{TOTAL} - N_{PRIMARY}\,OP}$$

where N_{IPO} is the number of shares offered, N_{TOTAL} is the total number of shares after IPO and $N_{PRIMARY}$ is the number of primary shares offered.

OCI can be decomposed into two parts:

$$OCI = \frac{N_{IPO}\,(P_1 - OP)}{N_{IPO}\,OP} \times \frac{N_{IPO}\,OP}{P_1 N_{TOTAL} - N_{PRIMARY}\,OP} = \text{Underpricing} \times \frac{1}{\text{EconOver}}$$

where the first part is underpricing and the second is the reciprocal of economic overhang, which expresses the value of shares retained by preexisting shareholders.

3.3.Private Equity Firm, Underwriter and Auditor

3.3.1. Private Equity backing (PE)

A dummy variable that equals one if the firm is backed by a private equity firm at the time of the offering, zero otherwise. Private equity firms should certify to the market the quality of the firms backed.

3.3.2. Private Equity reputation (PEREP)

Reputation can be proxied by the experience of the private equity firm. All else being equal, a private equity firm is more experienced, hence reputable, if it is older and has led a higher number of deals. Age has been extensively used as a proxy of experience and reputation (Gompers, 1996; Lin and Smith, 1998). The number of deals a private equity has taken part in represents its investment experience, which might help the private equity to face more complex situations (De Clercq and Dimov, 2012).

Lin and Smith (1998) measure private equity reputation alternatively as:

- age of the private equity firm before the offering;
- number of deals involved in as lead over the 10 years of the study;
- an index constructed as the average standardized value of both variables: 0,5 (Age of lead investor - Mean age)/σ_{age} + 0,5 (Number of deals - Mean number)/σ_{deals}

We believe that the most appropriate measure is the third one, which takes into consideration both the age and the number of deals. Hence, private equity reputation is being proxied by an index constructed as the average standardized value of age of the private equity firm before the offering and number of deals involved in over the 10 years of the study. If the firm was backed by more than one private equity at the time of IPO, we used the average of the indexes regarding those private equity firms.

3.3.3. Underwriter reputation (UWREP)

Market share is commonly used in the academic literature as a proxy for underwriter reputation (Megginson and Weiss, 1991; Dunbar, 2000; Aussenegg et al., 2006; Chemmanur and Krishnan, 2012; Boreiko and Lombardo, 2013)[5]. The intuition behind this approach is

5 The majority of US studies use the Carter and Manaster reputation ranking system, where underwriters are ranked based on their position in tombstone announcements. This method cannot be used in the Italian system due to the fact that the majority of the underwriters of Italian IPOs have not been active in the US IPO market.

that banks are credible certifiers because their future economic rents depend on the accuracy of the information produced during IPOs. Economic rents, market shares and reputation are, then, correlated. Boreiko and Lombardo (2013) are the first to apply this approach to the Italian market. Market share is calculated as the percentage of the total IPO value brought to the market over the entire sample period (2003-2012) [6].

3.3.4. Auditor reputation (BIGFOUR)

We proxied for prestigious auditors by creating a dummy variable that equals one if the firm hires a Big-Four[7] accounting firm to audit the IPO prospectus financial statements, following the assumption that, in order to maintain their investment in reputation capital, Big-Four firms provide higher quality services (DeAngelo, 1981; Teoh and Wong, 1993). This proxy is commonly used in the academic literature (Balvers et al., 1988; Beatty, 1989; Michaely and Shaw, 1995; Hogan, 1997; Firth and Liau-Tan, 1998).

3.4.Control variables

3.4.1. Age (LN_AGE)

We used the logarithm of the age of the firm at IPO as a control for the degree of information asymmetry (Ln (1+age)). Age is defined as the calendar year of offering minus the calendar year of founding. Thus, a 2-year old firm may be anywhere from 13 months old to 35 months old. We expect that older firms have a lower degree of information asymmetry compared to younger firms (Beatty and Ritter, 1986).

3.4.2. Size (LN_SIZE)

Larger IPOs are often made by more established firms, which should face lower risk and, therefore, the initial returns should be smaller (Beatty and Ritter, 1986). We measure offer size using the natural log of gross proceeds from the offering.

3.4.3. Share Overhang (SHARE_OVERHANG)

This control variable indicates the proportion of shares retained by pre-IPO owners. The variable can have opposite effects on underpricing. In fact, on one side, higher share retention should signal a high quality company and should reduce underpricing (Leland and Pyle,

6 Following Simon (1989), if 2 investment bankers are listed as co-managers, the proceeds of the issue are split equally between them. Thereafter, the average of the lead underwriters' market share is used as the measure of reputation (Megginson and Weiss, 1991). Transactions advised by an advisor that later merged with another advisor have been credited to the ultimately emerging entity only if the merger between those entities took place in the period under consideration (Schiereck et al., 2009).

7 The Big Four are the four largest international audit firms, namely PricewaterhouseCoopers, Deloitte Touche Tohmatsu Limited, Ernst & Young and KPMG.

1977). On the opposite side, higher share retention makes underpricing less costly (Bradley and Jordan, 2002).

3.4.4. Institutional Investors (INST_INV)

The percentage of shares reserved for institutional investors in an IPO is used as a control variable because, usually, the demand from institutional investors is greater in higher underpriced issues (Aggarwal et al., 2002).

Other control variables, such as the value of total assets and the amount of secondary shares offered in the IPO, have been excluded from the analysis due to strong collinearity problems.

3.5. Model

The study is divided in 2 groups: (i) the first group comprehends all firms which went public in the analyzed decade and tests the hypotheses H1, H3 and H4; (ii) the second group only includes those firms which were PE-backed at IPO and tests the hypotheses H2, H3 and H4. For each group, 2 dependent variables are studied: underpricing (UP) and opportunity cost of issuance (OCI). The model used is the Ordinary Least Squares, which is the most robust, from a mathematical point of view.

The OLS regression model takes the following general mathematical formulation:

$$Y_{UP} = a + b_1 X_{UWREP} + b_2 X_{BIGFOUR} + b_3 X_{PE} + b_4 X_{LN\_AGE} + b_5 X_{SHARE\_OVERHANG} + b_6 X_{INST\_INV}$$

and

$$Y_{OCI} = a + b_1 X_{UWREP} + b_2 X_{BIGFOUR} + b_3 X_{PE} + b_4 X_{LN\_AGE} + b_5 X_{SHARE\_OVERHANG} + b_6 X_{INST\_INV}$$

for the first group;

$$Y_{UP} = a + b_1 X_{PEREP} + b_2 X_{UWREP} + b_3 X_{BIGFOUR} + b_4 X_{LN\_AGE} + b_5 X_{LN\_SIZE}$$

and

$$Y_{OCI} = a + b_1 X_{PEREP} + b_2 X_{UWREP} + b_3 X_{BIGFOUR} + b_4 X_{LN\_AGE} + b_5 X_{INST\_INV}$$

for the second group, where bi (i= 1, 2, 3, 4, 5, 6) indicates the regression coefficient.

4. RESULTS

Table 4 presents the descriptive statistics. The average underpricing is 7.53, therefore the first-day closing price tends to be higher than the offer price. The average opportunity cost of issuance is also positive and equal to 4.16. In both cases, although, the dispersion from the average, expressed by the standard deviation, is very high, meaning that average is not a

particularly relevant central tendency. As it can be seen, UWREP is not available for a sample unit and PEREP is only available for 37 cases. It is not easy to interpret the average value of LN_AGE. Referring to the data originally used for the calculation of this variable, it can be noted that the average time for a firm to go public is relatively long (14.4 years). Only 25% of the companies go public within 3 years after the incorporation, while 50% of the companies employ up to 10.5 years, and 75% of the companies up to 20 years (the remaining 25% takes more than 20 years to go public). The average percentage of share retention (SHARE_OVERHANG) is 293%, with a very high dispersion. This means that shareholders retain almost 3 times the shares offered at IPO. Rather high is the average fraction of shares reserved to institutional investors (79%), confirming the important role played by these actors in the financial markets. The average underwriter market share (UWREP) is almost 8%, with a maximum value of 25%, although this information it is not particularly explanatory given its wide dispersion. The method of construction of the index PEREP does not allow an easy interpretation of the descriptive statistics. Referring to the data source used for the preparation of the index, it can be said that the average age of private equity firms is equal to 16 years, and each private equity firm has participated on average in 2 offers.

Table 4: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
UP	98	-20,00	67,57	7,5262	13,49756	1,788	,244	4,724	,483
OCI	98	-15,39	90,09	4,1587	13,13017	4,647	,244	25,662	,483
LN_AGE	98	,70	4,30	2,3449	,92348	-,088	,244	-,916	,483
SHARE_OVERHANG	98	,00	27,50	2,9347	3,40073	4,558	,244	28,455	,483
INST_INV	98	,00	1,00	,7939	,23717	-2,264	,244	5,448	,483
UWREP	97	,06	25,11	7,8971	8,30818	,771	,245	-,636	,485
PEREP	37	-,54	2,26	-,0149	,63876	1,775	,388	3,297	,759
LN_SIZE	98	13,70	21,50	17,5051	1,75402	-,024	,244	-,542	,483
Valid N (listwise)	37								

Finally, 2 dummy variables are also present, namely, BIGFOUR and PE. In the sample, over 75% of the offerings reported the presence of a Big-Four audit firm and about 38% of the issuers were PE-backed.

4.1.IPO Firms

4.1.1. First group (all firms) and UP

Statistical units with anomalous values of the UP were excluded, resulting in a sample of 91 firms. In addition, we eliminated the control variable LN_SIZE due to a strong collinearity problem that could not be resolved in any way.

Table 5 presents the correlation matrix between the independent variables and the dependent variable UP. As can be inferred, there are no significant correlations among the data. The negative sign of the variable BIGFOUR is in line with the expected inverse relationship with the UP, while the positive signs of the variables UWREP and PE contradict the hypotheses of a certification effect for underwriter reputation and PE-backing.

Table 5: Correlation matrix with the dependent variable UP

		UP	UWREP	BIGFOUR	PE	LN_AGE	SHARE_OVERHANG	INST_INV
UP	Pearson Correlation	1	,034	-,082	,045	,061	,100	,023
	Sig. (2-tailed)		,747	,438	,675	,564	,344	,828
	N	91	91	91	91	91	91	91
UWREP	Pearson Correlation	,034	1	,252*	,125	,122	-,222*	,008
	Sig. (2-tailed)	,747		,016	,239	,249	,035	,938
	N	91	91	91	91	91	91	91
BIGFOUR	Pearson Correlation	-,082	,252*	1	,183	,171	-,126	-,084
	Sig. (2-tailed)	,438	,016		,083	,106	,235	,428
	N	91	91	91	91	91	91	91
PE	Pearson Correlation	,045	,125	,183	1	,100	-,074	-,171
	Sig. (2-tailed)	,675	,239	,083		,345	,485	,104
	N	91	91	91	91	91	91	91
LN_AGE	Pearson Correlation	,061	,122	,171	,100	1	,032	-,020
	Sig. (2-tailed)	,564	,249	,106	,345		,766	,849
	N	91	91	91	91	91	91	91
SHARE_OVERHANG	Pearson Correlation	,100	-,222*	-,126	-,074	,032	1	,176
	Sig. (2-tailed)	,344	,035	,235	,485	,766		,095
	N	91	91	91	91	91	91	91
INST_INV	Pearson Correlation	,023	,008	-,084	-,171	-,020	,176	1
	Sig. (2-tailed)	,828	,938	,428	,104	,849	,095	
	N	91	91	91	91	91	91	91

*. Correlation is significant at the 0.05 level (2-tailed).

Tables 6 and 7 present a summary of the model and the resulting analysis of variance (ANOVA) required for the verification of the significance of the coefficient of determination R^2.

Table 6: Model Summary with the dependent variable UP

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,168[a]	,028	-,041	9,89303	2,090

a. Predictors: (Constant), INST_INV, UWREP, LN_AGE, PE, SHARE_OVERHANG, BIGFOUR

Table 7: ANOVA with the dependent variable UP

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	237,921	6	39,654	,405	,874[b]
	Residual	8221,252	84	97,872		
	Total	8459,173	90			

b. Predictors: (Constant), INST_INV, UWREP, LN_AGE, PE, SHARE_OVERHANG, BIGFOUR

The adjusted R^2 is almost zero and not significant, meaning that the set of independent variables cannot explain the variability of the dependent variable UP. The value of the Durbin-Watson index allows to state that there is no autocorrelation among the errors.

Table 8: Results from Ordinary Least Square Regression with the dependent variable UP

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	3,975	5,615		,708	,481	-7,191	15,140		
	UWREP	,081	,134	,069	,605	,547	-,186	,349	,882	1,134
	BIGFOUR	-2,418	2,569	-,107	-,941	,349	-7,526	2,690	,889	1,124
	PE	1,151	2,210	,058	,521	,604	-3,243	5,545	,931	1,074
	LN_AGE	,640	1,132	,062	,566	,573	-1,611	2,892	,955	1,047
	SHARE_OVERHANG	,292	,318	,103	,917	,362	-,341	,925	,911	1,098
	INST_INV	,319	5,507	,006	,058	,954	-10,633	11,271	,937	1,068

Table 8 presents the regression coefficients, the statistical significance testing, the 95% confidence intervals, and the collinearity indices, which confirm the absence of significant collinearity among the variables.

The regression model takes the following specific form:

$$Y_{UP} = 3.975 + 0.081\ X_{UWREP} - 2.418\ X_{BIGFOUR} + 1.151\ X_{PE} + 0.640\ X_{LN\_AGE} + 0.292\ X_{SHARE\_OVERHANG} + 0.319\ X_{INST\_INV}$$

No regression coefficient is statistically significant. The following weak relationships are observed: positive with the variables UWREP and PE and negative with the variable BIGFOUR.

Therefore, the hypotheses H1 and H3 are not reflected descriptively either, while the hypothesis H4 is verified descriptively, although it is not statistically significant.

The control variables have direct relationships with the UP, but none is statistically significant.

The hypotheses behind the OLS model are verified. In particular, this method requires the verification of three hypotheses about the residuals:

1. The average of the residuals is zero, i.e. errors are distributed normally;
2. No correlation between the residuals and the independent variables;
3. Homogeneity of variance (the so-called hypothesis of "homoscedasticity").

From the analyses conducted separately, residuals distribution's is approximately normal, they distribute randomly (the points are distributed equally above and below the horizontal axis, and there is no evidence of some systematic behavior), and the distance of the points from the horizontal axis does not seem to depend from the expected values of the dependent variable.

4.1.2. First group (all firms) and OCI

After eliminating firms with an abnormal value of OCI, the sample is made of 89 firms. Also in this group the control variable LN_SIZE presented a strong collinearity problem and was excluded. Table 9 presents the correlation matrix between the independent variables and the dependent variable OCI, which does not show significant relationships. The negative sign of the correlation coefficients of UWREP and BIGFOUR are in line with the expected inverse relationships with OCI, while the variable PE shows a positive sign, contrary to what was expected.

Table 9: Correlation matrix with the dependent variable OCI

		OCI	UWREP	BIGFOUR	PE	LN_AGE	SHARE_OVERHANG	INST_INV
OCI	Pearson Correlation	1	-,045	-,182	,051	,100	-,019	-,039
	Sig. (2-tailed)		,676	,088	,638	,349	,856	,715
	N	89	88	89	89	89	89	89
UWREP	Pearson Correlation	-,045	1	,162	,099	,126	-,241*	,104
	Sig. (2-tailed)	,676		,132	,357	,241	,024	,334
	N	88	88	88	88	88	88	88
BIGFOUR	Pearson Correlation	-,182	,162	1	,158	,130	-,146	,008
	Sig. (2-tailed)	,088	,132		,139	,226	,172	,940
	N	89	88	89	89	89	89	89
PE	Pearson Correlation	,051	,099	,158	1	,106	-,087	-,024
	Sig. (2-tailed)	,638	,357	,139		,321	,420	,823
	N	89	88	89	89	89	89	89
LN_AGE	Pearson Correlation	,100	,126	,130	,106	1	,005	,021
	Sig. (2-tailed)	,349	,241	,226	,321		,966	,842
	N	89	88	89	89	89	89	89
SHARE_OVERHANG	Pearson Correlation	-,019	-,241*	-,146	-,087	,005	1	,094
	Sig. (2-tailed)	,856	,024	,172	,420	,966		,383
	N	89	88	89	89	89	89	89
INST_INV	Pearson Correlation	-,039	,104	,008	-,024	,021	,094	1
	Sig. (2-tailed)	,715	,334	,940	,823	,842	,383	
	N	89	88	89	89	89	89	89

*. Correlation is significant at the 0.05 level (2-tailed).

The model summary and the analysis of variance (tables 10 and 11) show an adjusted R^2 around zero and not significant. Also in this case, the set of independent variables is not able to explain the variability of the dependent variable. The Durbin-Watson index assumes a value of 2.043, confirming the absence of autocorrelation of the residuals.

Table 10: Model Summary with the dependent variable OCI

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,239[a]	,057	-,013	3,29655	2,043

a. Predictors: (Constant), INST_INV, LN_AGE, SHARE_OVERHANG, PE, BIGFOUR, UWREP

Table 11: ANOVA with the dependent variable OCI

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53,409	6	8,902	,819	,558[b]
	Residual	880,246	81	10,867		
	Total	933,655	87			

b. Predictors: (Constant), INST_INV, LN_AGE, SHARE_OVERHANG, PE, BIGFOUR, UWREP

The regression model takes the following specific form:

$$Y_{OCI} = 2.915 - 0.016\, X_{UWEP} - 1.563\, X_{BIGFOUR} + 0.378\, X_{PE} + 0.407\, X_{LN\_AGE} - 0.055\, X_{SHARE\_OVERHANG} - 0.972\, X_{INST\_INV}$$

Table 12: Results from Ordinary Least Square Regression with the dependent variable OCI

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2,915	1,701		1,714	,090	-,469	6,299		
	UWREP	-,016	,047	-,040	-,347	,729	-,111	,078	,896	1,116
	BIGFOUR	-1,563	,870	-,201	-1,797	,076	-3,293	,168	,930	1,076
	PE	,378	,735	,057	,514	,608	-1,084	1,839	,956	1,047
	LN_AGE	,407	,396	,113	1,026	,308	-,382	1,195	,962	1,039
	SHARE_OVERHANG	-,055	,105	-,059	-,522	,603	-,263	,154	,918	1,089
	INST_INV	-,972	1,561	-,068	-,623	,535	-4,078	2,134	,974	1,026

The variable BIGFOUR is statistically significant (p-value = 0.076), highlighting the existence of an inverse relationship with the dependent variable OCI. Therefore, hypothesis H4 is verified at 10% significance level.

UWREP and PE are not statistically significant, showing a p-value of 0.729 and 0.608 respectively. Descriptively, the UWREP coefficient takes a value close to zero (independence on average), while PE shows a positive coefficient (moderate direct relationship). Hence, H1 and H3 are not verified.

With regards to the remaining control variables, LN_AGE shows a positive relationship, while SHARE_OVERHANG and INST_INV show a negative relationship, although none of them is statistically significant.

In a separate analysis we verified that OLS residuals properties are respected.

4.2.Private Equity-Backed firms

4.2.1. Second group (PE-backed firms) and UP

Two firms were excluded from the sample due to anomalous values of UP, resulting in a sample of 35 firms.

In the selection of the control variables we excluded the variable SHARE OVERHANG due to the high collinearity found. In addition, due to the small amplitude of the sample, we eliminated the variable INST_INV, which also showed a very low correlation with the variable UP.

The matrix of correlations (table 13) shows the existence of an inverse correlation, already significant at 1%, between the variables BIGFOUR and UP, exactly as expected; on the opposite, there is a modest, direct correlation between UWREP and UP and almost no correlation between PEREP and UP. Furthermore, the variable LN_SIZE has an inverse correlation with UP, significant at 1%.

Table 13: Correlation matrix with the dependent variable UP

		UP	PEREP	UWREP	BIGFOUR	LN_AGE	LN_SIZE
UP	Pearson Correlation	1	-,022	,064	-,470**	,022	-,480**
	Sig. (2-tailed)		,901	,716	,004	,898	,004
	N	35	35	35	35	35	35
PEREP	Pearson Correlation	-,022	1	-,253	,298	,141	-,049
	Sig. (2-tailed)	,901		,143	,082	,418	,780
	N	35	35	35	35	35	35
UWREP	Pearson Correlation	,064	-,253	1	,034	,061	,305
	Sig. (2-tailed)	,716	,143		,848	,729	,075
	N	35	35	35	35	35	35
BIGFOUR	Pearson Correlation	-,470**	,298	,034	1	,170	,487**
	Sig. (2-tailed)	,004	,082	,848		,329	,003
	N	35	35	35	35	35	35
LN_AGE	Pearson Correlation	,022	,141	,061	,170	1	-,090
	Sig. (2-tailed)	,898	,418	,729	,329		,609
	N	35	35	35	35	35	35
LN_SIZE	Pearson Correlation	-,480**	-,049	,305	,487**	-,090	1
	Sig. (2-tailed)	,004	,780	,075	,003	,609	
	N	35	35	35	35	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

The model summary and the analysis of variance (tables 14 and 15) show an adjusted R^2 of 0.236, which is statistically significant at 5% (p-value = 0.023). Therefore, the set of

independent variables explains the 23.6% of the variability of the dependent variable UP. The Durbin-Watson index has a value of 1.84, very close to 2, indicating the absence of autocorrelation among the residuals.

Table 14: Model Summary with the dependent variable UP

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,590[a]	,348	,236	7,60415	1,837

a. Predictors: (Constant), LN_SIZE, PEREP, LN_AGE, UWREP, BIGFOUR

Table 15: ANOVA with the dependent variable UP

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	894,808	5	178,962	3,095	,023[b]
	Residual	1676,870	29	57,823		
	Total	2571,678	34			

b. Predictors: (Constant), LN_SIZE, PEREP, LN_AGE, UWREP, BIGFOUR

The regression model is the following:

$$Y_{UP} = 50.446 + 1.472\ X_{PEREP} + 0.224\ X_{UWREP} - 8.015\ X_{BIGFOUR} + 0.142\ X_{LN\_AGE} - 2.243 X_{LN\_SIZE}$$

Table 16: Results from Ordinary Least Square Regression with the dependent variable UP

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	50,446	18,454		2,734	,011	12,703	88,189		
	PEREP	1,472	2,227	,110	,661	,514	-3,083	6,027	,816	1,225
	UWREP	,224	,170	,217	1,321	,197	-,123	,572	,830	1,205
	BIGFOUR	-8,015	4,646	-,327	-1,725	,095	-17,518	1,489	,625	1,600
	LN_AGE	,142	1,465	,015	,097	,924	-2,854	3,138	,909	1,100
	LN_SIZE	-2,243	1,114	-,380	-2,013	,053	-4,522	,036	,631	1,585

The variable BIGFOUR has an inverse relationship with UP and is statistically significant at 10% (p-value= 0.095), therefore the hypothesis H4 is verified. Also the control variable LN_SIZE shows an inverse relationship with UP, statistically significant at 10%, nearly significant at 5% (p-value = 0.053).

The other coefficients are not statistically significant. Descriptively it can be noted that the variables PEREP and UWREP show a positive relation with UP that contradicts, respectively, hypothesis H2 and H3. The variable LN_AGE has a substantially null coefficient.
OLS residuals properties have been verified and are respected.

4.2.2. Second group (PE-backed firms) and OCI

Also in this model two firms were excluded due to anomalous values of OCI, resulting in a sample of 35 firms.
In the selection of the control variables we excluded the variable SHARE OVERHANG due to the high collinearity found. In addition, we substituted the variable LN_SIZE with the variable INST_INV, because the latter showed a slightly higher correlation with the dependent variable OCI.
The correlation matrix (table 17) shows no statistically significant correlations between the independent variables and the dependent variable. The table presents negative signs for the variables PEREP, UWREP, and BIGFOUR, which is what was hypothesized.

Table 17: Correlation matrix with the dependent variable OCI

		OCI	PEREP	UWREP	BIGFOUR	LN_AGE	INST_INV
OCI	Pearson Correlation	1	-,162	-,151	-,319	,068	-,047
	Sig. (2-tailed)		,354	,388	,062	,696	,789
	N	35	35	35	35	35	35
PEREP	Pearson Correlation	-,162	1	-,181	,285	,173	,278
	Sig. (2-tailed)	,354		,299	,097	,321	,105
	N	35	35	35	35	35	35
UWREP	Pearson Correlation	-,151	-,181	1	,002	,027	,249
	Sig. (2-tailed)	,388	,299		,993	,879	,149
	N	35	35	35	35	35	35
BIGFOUR	Pearson Correlation	-,319	,285	,002	1	,207	,386*
	Sig. (2-tailed)	,062	,097	,993		,233	,022
	N	35	35	35	35	35	35
LN_AGE	Pearson Correlation	,068	,173	,027	,207	1	,006
	Sig. (2-tailed)	,696	,321	,879	,233		,972
	N	35	35	35	35	35	35
INST_INV	Pearson Correlation	-,047	,278	,249	,386*	,006	1
	Sig. (2-tailed)	,789	,105	,149	,022	,972	
	N	35	35	35	35	35	35

*. Correlation is significant at the 0.05 level (2-tailed).

The model summary and the analysis of variance (tables 18 and 19) show a not significant (p-value = 0.260) very low adjusted R^2 (equal to 0.053), therefore, only 5.3% of the variability of OCI is explained by the independent variables considered. The Durbin-Watson index assumes the value of 1.54, showing a slight positive autocorrelation of the residuals, but not worrisome, given the size.

Table 18: Model Summary with the dependent variable OCI

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,439[a]	,193	,053	3,24605	1,540

a. Predictors: (Constant), INST_INV, LN_AGE, UWREP, PEREP, BIGFOUR

Table 19: ANOVA with the dependent variable OCI

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	72,848	5	14,570	1,383	,260[b]
	Residual	305,569	29	10,537		
	Total	378,417	34			

b. Predictors: (Constant), INST_INV, LN_AGE, UWREP, PEREP, BIGFOUR

The regression model is the following:

$$Y_{OCI} = 1.725 - 0.961\ X_{PEREP} - 0.100\ X_{UWREP} - 3.630\ X_{BIGFOUR} + 0.698\ X_{LN\_AGE} + 3.134\ X_{INST\_INV}$$

Table 20: Results from Ordinary Least Square Regression with the dependent variable OCI

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1,725	2,697		,640	,527	-3,792	7,242		
	PEREP	-,961	,956	-,187	-1,005	,323	-2,916	,995	,808	1,238
	UWREP	-,100	,074	-,242	-1,344	,190	-,252	,052	,860	1,162
	BIGFOUR	-3,630	1,772	-,386	-2,048	,050	-7,255	-,004	,783	1,278
	LN_AGE	,698	,653	,186	1,070	,293	-,636	2,033	,925	1,081
	INST_INV	3,134	2,880	,213	1,088	,286	-2,757	9,025	,725	1,379

BIGFOUR is the only significant regression coefficient (5%). Therefore, there is an inverse relationship between the variable BIGFOUR and the OCI, which confirms the hypothesis H4.

PEREP and UWREP show no statistically significant regression coefficients, but they both present negative signs, indicating, at least descriptively, an inverse relationship with the OCI, in line with the hypotheses H2 and H3.
The remaining independent variables LN_AGE and INST_INV present a direct relationship with the OCI.
As with the other models, OLS residuals properties have been verified and are respected.

5. DISCUSSION

Following the certification theory, firms can take advantage of third-party reputation when trying to convey information about their quality to uninformed agents. However, evidence shows that this theory mainly holds in Anglo-Saxon countries such us the U.S., while other countries show different patterns. The analysis conducted in this paper sheds lights on some peculiarities of the Italian market. In particular, private equity firms and underwriters do not cover a certification role during IPOs.
The first group of analysis, which includes all issuing firms in the decade 2003-2012, shows that PE-backed firms and firms with reputable underwriter experience higher underpricing, although the relationship is not statistically significant. When substituting underpricing with the opportunity cost of issuance, private equity presence still causes an increase in the dependent variable, while underwriter's reputation has no impact.
Our results show that there are no statistically significant differences between PE-backed firms and other firms and between firms backed by reputable private equity firms and other firms. This is in line with evidence from other European and Asian countries, mainly bank-oriented countries (e.g. Hamao et al., 2000; Franzke, 2004; Chanine et al., 2007), meaning that importance must be paid to institutional environments. This evidence is consistent with the fact that the Italian private equity market is still young and probably inefficient under this point of view. It does not seem to pay to hire a prestigious underwriter either. Hence, investors are probably not as much sophisticated as to fully recognize the value-added and certification role of private equity firms and underwriters. Underpricing has been studied extensively in the finance literature, but our findings support the evidence that its understanding in the international context is still lacking.
An interesting finding is the role of auditors during IPOs. Our results show that the presence of a Big-Four auditor has a clear impact of IPO's performance. It has a negative effect on underpricing and this effect is more prevalent on OCI, becoming statistically significant.

Hence, it can be said that the Italian market looks at IPOs favorably only when a reputable auditor is certifying the issue.

The second part of our analysis focuses on issues backed by a private equity firm, in order to test if the certification theory holds when looking at private equity reputation.

Unfortunately, as it can be imagined, issuers do not benefit from private equity's and underwriter's reputation. There are no statistically significant differences between issuers with reputable private equity firms and underwriters and other firms. Only when looking at their impact on OCI, the analysis shows a negative relationship, which is in line with the hypotheses H2 and H3, although the relationship is not statistically significant.

Consistent with our hypothesis, auditors play an important role also for this group of firms. In particular, BIGFOUR is statistically significant both for underpricing and OCI. PE-backed firms, which hire a Big-Four auditor, present lower underpricing and lower OCI at IPO.

Thus, evidence confirms that the Italian market is not very sophisticated, compared to market-oriented systems, and, either investors do not rely on third-party certification, or they look for other information. Investors do not appreciate the certification function of experienced and reputable private equity firms and underwriters as a mean of reducing the degree of underpricing. One possible explanation could come from Franzke (2004), who analyzed the German market. Having assessed the same problem of higher underpricing for PE-backed firms, he calculates the approximate return from investment until IPO for four IPO firms held by a German venture capital firm. He finds that, although underpriced, each investment was a success story for the venture capitalist and formulates the hypothesis that venture capitalists do not care much about underpricing but are more concerned about the long-run performance and the timing of the further exit, since they still retain part of the investment at IPO. Another explanation could be the agency problem proposed by Loughran and Ritter (2004). The authors hypothesize that VCs and underwriters, given their role of active and repeated players in the IPO market, tolerate larger levels of underpricing in order to receive other favors. It might also be useful to look at the underwriter's compensation, as Beatty and Welch (1996) found that, in the US market, investors are skeptical and demand higher underpricing for firms which pay unusually large compensations and indicate unusually few risk factors in the IPO prospectus. Another argument comes from Loughran and Ritter (2004)'s agency hypothesis. They see underpricing as a form of indirect compensation to underwriters, because, on one hand, it makes it easier to find buyers for IPOs, reducing their marketing expenses and, on the other hand, investors will engage in rent-seeking

behavior to improve their priority for being allocated shares in hot IPOs. This behavior leads investors in overpaying for commissions in order to have preferential access to IPOs. Thus prestigious underwriters have lowered their standards and issuing firms accept greater underpricing from them because of increases in the perceived importance of analyst coverage and higher wealth levels.

Control variables are, in general, not significant. LN_SIZE (the natural log of gross proceeds from the offering) is the only significant control variable and has a negative relationship, as expected. Larger IPOs are often made by more established firms, which should face lower risk and, therefore, underpricing should be smaller. INST_INV respects the expected relationship more or less, although only descriptively, providing support to the idea that, usually, the demand from institutional investors is greater in higher underpriced issues (Aggarwal et al., 2002).

It should be noted that, although we used the main control variables suggested in literature, the regression models do not explain the variability of the dependent variables, as shown by R^2.

6. CONCLUSION

The main contribution of this paper is to shed further light on the Italian stock market and its participants' behavior. In particular, the role of private equity firms, underwriters and auditors in certifying the quality of a firm when going public is examined.

Following the certification hypothesis, underpricing should be lower for PE-backed IPOs (Barry et al., 1990; Megginson and Weiss, 1991), for IPOs with prestigious private equity firms (Lin and Smith, 1998), prestigious underwriters (Beatty and Ritter, 1986; Carter and Manaster, 1990), and prestigious auditors (Titman and Trueman, 1986; Balvers et al. 1988), due to a reduced ex-ante uncertainty regarding the value of the firm.

We test the validity of the certification hypothesis on a sample of all IPOs on the Italian Stock Exchange over the decade 2003-2012. This period allows to isolate the effects deriving from the "bubble" years (1999-2000) and its consequences (2001-2002). First, we divided the sample in 2 groups: on one side, all firms which went public in the analyzed decade and, on the other side, only those firms which were PE-backed at IPO, in order to test the private equity reputation effect. Second, we conducted separated OLS regression analyses for 2 dependent variables: underpricing (UP) and opportunity cost of issuance (OCI). Focusing only on underpricing could be misleading indeed, as it does not take into account the behavior of

existing shareholders. Since what really matters is the "money left on the table" (Barry, 1989; Habib and Ljungqvist, 2001), we analyze OCI, in order to calculate the cost of going public to pre-IPO shareholders. In fact, if underpricing is high but the amount of shares sold is low, the wealth loss would be minimal. OCI takes into consideration both the effect of underpricing on the existing shares sold from shareholders at IPO and the cost of dilution associated with the newly issued shares.

With regards to the certification role of private equity firms and underwriters, we did not find any support for hypotheses H1, H2 and H3. On the contrary, PE-backed firms, firms backed by prestigious private equity firms and supported by prestigious underwriters are not better off than others. Although the results show that the benefits of being backed by a private equity firm is not reflected in the IPO phase, it is unclear is if benefits are then reflected in the aftermarket, as work by Brav and Gompers (1997) suggests for the US market.

When analyzing the certification effect on the wealth loss by pre-IPO shareholders through the consideration of OCI, we still find no support for hypotheses H1, H2 and H3.

Thus, the hypotheses on the certification role of private equity firms and underwriters with respect to underpricing and opportunity cost of issuance have not been confirmed.

The only certification effect we could assess is the one fulfilled by auditors. Hence, only hypothesis 4, that reputable auditors reduce underpricing and OCI, finds considerable support. In the Italian market Big-Four accounting firm's reputation is relevant to solving asymmetric information problems.

The results of this paper may suggest testing other hypotheses in the Italian market, mainly the grandstanding and the adverse selection. The evidence that private equity firms sell only part of their shares at IPO (Franzke, 2004), could bring to examine their further exit strategy.

Our research contributes to the understanding of this phenomenon in bank-oriented countries and enhances the understanding of the European environment. The issue that PE's and underwriter's certification effect does not hold in the Italian market is very important because it shows that underdevelopment of stock market is a weakness for the economy and a limit for firms' profitability. In the young Italian financial market, investors are not able to fully recognize the value-added and certification role of private equity firms and underwriters. It would be very interesting to test whether the conjecture that as the financial market becomes more mature, investors learn more and more about the role of private equity firms and underwriters, and that consequently the observed inefficient patterns disappear.

Although, at least a couple more years have to pass in order to have some more observations and make this analysis feasible.

In summary, no certification effect at the IPO could be found for private equity firms and underwriters.

The finding that literature's mainly used control variables do not have considerable explanatory power should also deserve future research.

With this research we expect to give contributions to entrepreneurs facing quotation. During an IPO, shareholders can convey information regarding the firm's quality using credible signals. Knowing which signals perform better than others can help firms decide what strategy to follow. Finally, we also expect to give contributions to investors scouting the IPO market, who can reduce information asymmetries and choose high quality investments exploiting informative signals.

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CHAPTER II

LENDING RELATIONSHIP AND THE ROLE OF THE UNDERWRITER: EVIDENCE FROM ITALIAN IPOs

ABSTRACT

This paper investigates whether and how the existence of a prior lending relationship with the IPO underwriting bank ameliorates or worsens information asymmetries, affecting the firm's IPO and post-IPO performance in the Italian market. In particular, when the relationship between a firm and its lending bank extends to underwriting activities it can lead to two opposing effects: certification or conflict of interest. While evidence from the US shows a predominance of the certification role of underwriters, the findings from the Italian market are twofold. At first, results support a prominence of the certification hypothesis, as investors require a smaller underpricing for IPOs with lending relationships. However, in the long run, the conflict of interest effect prevails and stock performance shows a negative relationship with the lending relationship. The results question the ability of the Italian market to correctly evaluate IPOs.

1. INTRODUCTION

The existence of financial intermediaries is mainly explained by the problem of asymmetric information (Leland and Pyle, 1977). In financial markets, information asymmetries among the various agents are particularly pronounced. On one side, investors may find difficult to have access and understand firms' proprietary information and can be skeptical about the truthfulness of the information received. On the other side, firms can find very complicated to convey information about their quality to uninformed agents and some may also try to fool investors overselling themselves. These problems can be solved by financial intermediaries, institutions specialized in the acquisition, process, certification and transfer of information. When a firm decides to go from private to public, information asymmetries are particularly marked. A way to overcome this situation lies in the choice of the underwriting bank. During IPOs, underwriters certify firms' value and facilitate the sell of shares. This paper investigates the effects created by the underwriter on a firm's IPO, when the firm appoints a bank with

which it has already a lending relationship. In details, we test whether lending relationships established before the IPO ameliorate or worsen asymmetric information problems behind IPO performance.

When a bank lends its own funds to a firm, it creates a type of relationship that generates stronger incentives to screen and monitor the firm closely, since the lending bank has a stake in the borrowing firm. This study focuses the attention on the debate regarding the role of the lending-relationship bank at IPOs, whether it results in certification or conflict of interest.

Much attention has been devoted to the role of banks as both lenders and underwriters. On one side, given the privileged access to proprietary information gained in the past, underwriters with lending relationship have better knowledge of clients and work as certifiers of their value (the "certification" hypothesis). A lending relationship reduces information asymmetries between the underwriting bank and the firm (Petersen and Rajan, 1994; Boot, 2000). If the basis of IPO share price and performance is represented by the asymmetric information problem, then firms with an existing lending relationship with the underwriter should experience less of an asymmetric information problem than other firms, and consequently might exhibit higher IPO performance.

On the other side, underwriters with lending relationship may take advantage of this information, trying to get rid of low quality issues to the detriment of market investors (the "conflict of interest" hypothesis) (Mehran and Stulz, 2007).

The research question is whether, in Italy, the existence of a lending relationship with the IPO underwriter affects the firm's IPO and post-IPO performance.

In the US there has been an extensive debate regarding, firstly, the participation by commercial banks into the securities underwriting business and, secondly, the existence of a lending relationship between the issuing firm and the underwriting bank. The first point refers to the elimination of the 1933 Glass-Steagall Act and the risk of potential conflict of interest regarding commercial banks' possibility to engage in investment banking activities, such as the underwriting business. Results from the US are more consistent with a certification rather than a conflict of interest effect (Kroszner and Rajan, 1994; Puri, 1994, 1996; Gande et al., 1997; Fields et al., 2003; Fields and Fraser, 2004), while international evidence is ambiguous (Ursel and Ljucovic, 1998; Hamao and Hoshi, 2000; Hebb and Fraser, 2002; Konishi, 2002; Klein and Zoeller, 2003; Takaoka and McKenzie, 2006; Kang and Liu, 2007). The second question refers to the role of the lending bank, whether it results in certification or conflict of interest. Again, evidence from the US confirms a certification effect

(James, 1987; James and Wier, 1990; Slovin and Young, 1990; Hebb, 2002; Schenone, 2004; Drucker and Puri, 2005; Benzoni and Schenone, 2010; Duarte-Silva, 2010; Chen et al., 2014), supporting the idea that banks possess and use private information deriving from their loan activity to reduce information asymmetries.

On the international side results are limited, fragmented and equivocal and mainly support the conflict of interest effect (Hamao et al., 2000; Ber et al., 2001; Bessler and Kurth, 2007; Hearn, 2011).

As far as we are aware, this is the first study to investigate the certification and conflict of interest hypotheses when the IPO underwriter has prior lending relationships with the issuer in the Italian market. International evidence is insufficient and the scarcity of studies regarding the European contest provides space for research. In addition, the fact that the few available results demonstrate that the certification hypothesis does not hold in bank-oriented countries makes the Italian contest a good field of research.

We investigate the impact of a prior lending relationship on four characteristics of IPO: underpricing, price revision and long-term performance at two and four years following the IPO.

Underpricing is the dominant indicator of IPO performance in literature (Ritter, 1998; Daily et al., 2003). IPO price revision is the revision in the offer price from the midpoint of the filing range and refers to IPOs adopting a book building mechanism. Price revision depends on investors' demand generated during the book building period. When pricing a share, underwriters usually choose a book building mechanism in order to reduce the information asymmetries surrounding the IPO and stimulate investors to disclose information (Benveniste and Spindt, 1989).

Finally, because pre-IPO lending relationships may affect post-IPO performance (Gonzalez and James, 2007), we examine stock long-run performance, calculating the market-to-book ratio at two and four years following the IPO.

The findings of this paper are twofold: we find that at the time of IPO, investors rely on the certification role of the lending bank and require lower underpricing, validating the certification theory, although in the long run, the conflict of interest effect prevails and the market-to-book ratios show a negative relationship with the lending relationship. The results question the ability of the Italian market to correctly evaluate IPOs.

The remainder of the paper is organized as follows: Section 2 presents literature about the certification and conflict of interest hypotheses. Section 3 describes data, sample construction

procedures, variable definitions and the methodological approach. Section 4 reports the results, Section 5 describes the main results and Section 6 concludes the paper.

2. CERTIFICATION vs. CONFLICT OF INTEREST

Several theories try to explain the existence of financial intermediaries, mainly tied to the existence of transactions costs (Benston and Smith, 1976), the protection of the confidentiality of information (Campbell, 1979) and the problem of asymmetric information (Leland and Pyle, 1977). The theory based on the information asymmetry problem is of particular relevance because, in a transaction, an agent who has private information that can affect the other agent's decision, might try to take full advantage of the potential gains involved (Riley, 2001). One of the most cited theory to resolve the information asymmetry problem is the signaling theory, where the informed party moves first and uses signals to convey information to the uninformed agent, in order to reduce information asymmetries and uncertainty. Akerlof (1970) and Spence (1973) are among the first to illustrate how asymmetric information can affect equilibrium trades, using the car and the labor markets respectively. In a competitive marketplace, on one side, informed agents can signal their quality by taking some costly action and, on the other side, uninformed agents can look at the costly action as a way to screen the market for quality. In financial markets, signals are usually used to highlight the quality of a firm, which should reflect in its stock prices and market valuation (Riley, 2001). A moment characterized by significant information asymmetries is the IPO of equity (Baron, 1982; Beatty and Ritter 1986; Rock, 1986; Chemmanur, 1993). The relationship between financial information and equity values in the IPO contest is very weak (Kim and Ritter, 1999) and both the issuing firm and the market investors might find useful to rely on some signaling system. One of the signals that can be used by a firm at IPO is the appointing of one of its lending banks as underwriter.

This study focuses the attention on the debate regarding the role of the lending-relationship bank in IPOs, whether it results in certification or conflict of interest.

On one side, a strand of the finance literature shows that lending relationships can reduce the problem of asymmetric information between the firm and the market (the certification hypothesis) (Petersen and Rajan, 1994; Boot, 2000). On the opposite side, there is a large and growing literature on conflicts of interest in financial institutions, related to incentives banks can have in using private information gained through their lending activities for their personal profit (the conflict of interest hypothesis) (Mehran and Stulz, 2007).

When a firm goes public, outside investors are asymmetrically informed about the true value of the firm, therefore, an underwriter with private information resulting from a lending relationship should be better able to certify the firm value than other underwriters. In fact, in doing so, the underwriter puts its reputation at stake and conveys positive private information to outsiders. Therefore, being underwritten by a lending-relationship bank should lead to a reduction in information asymmetry and an increase in firm value. In addition, lending banks should avoid the underwriting of their low-value clients, which are typically high-risk IPOs and can expose the bank to a conflict of interest. This selection mechanism is reinforced because high-value firms also have an incentive to go public with their bank, which is in a position to certify the high value of their stock. On the opposite, low-value firms are indifferent in the choice of the underwriter.

However, when a bank has prior financial claims with a firm, it has access to private information unavailable to the market, which can be used at its own advantage. This situation may rise concerns about misrepresentation of the firm's value in order to use the issue proceeds to pay back the outstanding loans with the bank, protecting its own interests at the expense of investors. In addition, IPOs strengthen an issuer's financial condition, thus reducing the possibility that the underwriting bank might suffer a loss on its outstanding loans. This circumstance would diminish the market's perception of the lending-relationship banks' certification role. The availability of proprietary firm-specific information deriving from its lending activity can bring the underwriter to fool the public into buying overpriced securities. In this situation, banks do not refuse to underwrite their low-value clients' IPOs and there is no difference between IPOs underwritten by lending banks and other IPOs. Therefore, the existence of pre-IPO lending relationships between the underwriter and the firm can create moral hazard problems between the underwriter and outside investors, although it must be noted that such actions bear indirect costs, including reputation costs, which may deter banks from doing so.

In summary, the existence of a lending relationship can have two opposite effects. On one side, it can lead to better certification as the bank can certify the firm's value more accurately; on the other side, it can bring to a conflict of interest as the bank can misuse private information for its own profit.

There has been an extensive debate in the United States regarding the costs and benefits of participation by commercial banks in the securities underwriting business. To solve potential conflicts of interest, the 1933 Glass-Steagall Act banned commercial banks from engaging in

investment banking activities. Over time this restriction was relaxed and definitively declined with the 1999 Gramm-Leach-Bliley Financial Modernization Act. Motivated by this change in regulation, previous studies in the US contest have investigated the conflict of interest and certification debate by examining the underwriting of bonds before the Glass-Steagall Act (Kroszner and Rajan, 1994; Puri, 1994, 1996). Kroszner and Rajan's results (1994) were not consistent with the conflict of interest hypothesis, but showed that commercial banks underwrite higher-quality bonds and their issues performed better than comparable issues underwritten by investment banks. This is because the market is aware of this potential conflict of interest and requires commercial banks to focus on more senior and safer issues. Issues underwritten by banks default less than non-bank underwritten issues (Puri, 1994) and when there is a lending relationship, banks act as certifiers of firm value, as investors are willing to pay a higher price for issues underwritten by commercial banks (Puri, 1996). The author shows that, in the issuing market, commercial banks add value to the issue and the certification effect completely dominates the conflict of interest effect.

More recent work find some evidence for certification when examining debt securities underwritten by Section 20 subsidiaries[8] of US bank holding companies and those underwritten by investment houses (Gande et al., 1997). The authors find that bank subsidiaries set abnormally high subscription prices (resulting in lower yields) for risky firms that have lending activities with the bank.

In Canada, Hebb and Fraser (2002) find that commercial bank underwritten bonds have lower yields compared to investment bank underwritten bonds, consistent with a certification hypothesis.

In 1993, Japan underwent a financial system reform similar to the US reform. Studying the post-reform Japanese corporate bonds market, Konishi (2002) and Takaoka and McKenzie (2006) find evidence that rejects the concern about the conflict of interest, while Hamao and Hoshi (2000) and Kang and Liu (2007) find that issues brought to the market by commercial banks have lower offer prices than those underwritten by investment banks, suggesting greater concern about underwriter conflicts of interest. These results question the generalization of the US experience to other economies, particularly bank-based and emerging economies, which have weak financial markets and strongly rely on the banking system.

8 A "Section 20 subsidiary " is a securities' affiliate of a bank that was allowed, under judicial construction of the Glass-Steagall Act Section 20, to engage to a limited extent in the underwriting of securities that banks were generally ineligible to underwrite.

Many studies focus the attention on debt issues, although the question if it is prevailing the certification or the conflict of interest effect is even more relevant in equity issues. The evidence that the certification effect is greater for junior and information-sensitive issues in the bond market (Puri, 1996), makes the potential benefit higher for equity issues, as they tend to be the most information-sensitive issues. As for the conflict of interest effect, it is easier for banks to shift bankruptcy risk to the market. In fact, while bonds have fixed payments to respect in order to avoid default, stocks do not have such obligations and it is difficult to link stock performance to the underwriting bank.

In US, Fields et al. (2003) report lower underpricing and superior long-run performance for commercial bank underwritten IPOs compared to investment bank underwritten IPOs, while gross margin costs are generally the same. In addition, commercial banks price IPOs as fairly as investment banks and market response to mispriced IPOs is no greater for commercial banks than for investment banks (Fields and Fraser, 2004).

In Canada, Ursel and Ljucovic (1998) analyze the effects of the deregulation occurred in 1987 and find that IPOs underwritten by commercial banks receive lower underpricing. However, this seems to be due to the reputation of the underwriter rather than the bank ownership per se.

Evidence in Germany shows that IPOs underwritten by universal banks present higher underpricing and average after-market performance, suggesting that investors fear and require compensation for potential conflicts of interest associated with universal banking (Klein and Zoeller, 2003). Furthermore, the authors suggest to look at pre-existing bank relationships that might be important in the choice of the underwriter.

Bringing the attention to the existence of a lending relationship between the issuing firm and the bank, this relationship to be a positive signal to the stock market, which reflects on stock prices (James, 1987; James and Wier, 1990). A lending relationship creates strong ties between the bank and the firm that facilitate monitoring and screening and can overcome problems of asymmetric information. On one side, firms are inclined to reveal more proprietary information, and, on the other side, banks are prone to invest in producing information. In the process of lending, banks learn more than others about their borrowing firms. James (1987) finds that firms' stock prices react positively to bank loan announcements, while they show zero or negative reaction to privately placed and public issues of debt announcement. Firms with bank debt before the IPO show lower underpricing than issuers without bank debt, showing the importance of banks' role in providing valuable

asset services to corporate borrowers (James and Wier, 1990; Slovin and Young, 1990). The authors couldn't study the effect of the lending relationship on underpricing as the Glass-Steagall Act was still operating, so they just showed that having bank debt before IPO was a signal to the market that the firm is of high-value.

On the bank side, Yasuda (2005) shows that prior lending relationships have a positive impact on the underwriter choice in the corporate-bond market and Bharath et al. (2007) find a higher probability for a bank to be hired as an underwriter if a lending relationship exists. Finally, Ljungqvist et al. (2006) find that prior lending and underwriting relationships increase a bank's probability of being chosen as underwriter.

The purpose of this study is to investigate the certification and conflict of interest debate by examining which of the two characterizes an IPO when a firm's lending bank is also the IPO underwriter in the Italian market.

Puri (1999) develops a theoretical model showing that commercial banks with lending relationships can obtain better prices for underwritten securities than investment banks, particularly when information collection costs are high.

Extending James and Wier (1990) and Slovin and Young (1990) results, Schenone (2004) looks at the effects of having a pre-IPO relationship with a potential underwriter and finds support for the certification hypothesis. Underpricing is lower when a US commercial bank is both the underwriter and a prior lender to the firm. In addition, looking deeper into different types of banking relationships, she finds that IPOs with prior lending relationships underprice less than IPOs with prior underwriting relationships. On one side, a previous underwriting bank has less incentives to monitor the firm compared to a previous lending bank, because once the underwriting business is over, interactions with the firm stop or reduce substantially. The lending-relationship bank, instead, is incentivized to monitor the firm closer and constantly, due to the stake (the loan) it owns in the firm. On the other side, a firm with a previous underwriting relationship has already done a private or a public debt placement and already disclosed some private information to the market. When the firm goes public, it is not completely unknown to the market and the underwriter has a minor role in reducing information asymmetries. On the opposite, a firm with a prior lending relationship is totally unknown to the market, hence the market values more the role of the underwriter.

Analyzing seasoned equity offerings, Drucker and Puri (2005) and Duarte-Silva (2010) find that an underwriter is better able to certify an equity issue if it has a lending relationship with the firm. A lending relationship lowers the gross spreads and the underpricing of seasoned

equity offerings and exhibits better long-run performance than other seasoned equity offerings (Chen et al., 2014).

Starting from Schenone (2004), Benzoni and Schenone (2010) find that high-value firms typically go public with their relationship bank, while low-value firms choose an independent underwriter, supporting the bank's certification role. Investors recognize the bank's behavior and value IPOs underwritten by the relationship bank higher than the other IPOs. They also find that the long-run performance of IPOs underwritten by relationship banks is similar to those underwritten by non-relationship banks.

Hebb (2002) shows that the underpricing of IPOs underwritten by commercial banks with previous lending relationship is significantly lower than those underwritten by investment banks.

Gompers and Lerner (1999) investigate the conflict of interest hypothesis using venture capital (VC) backed IPOs, suggesting that having a stake in the firm through a venture capital subsidiary poses conflicts for the underwriting bank analogous to having a lending relationship prior to the IPO. They find that the market requires a greater discount at IPO to compensate for potential conflicts of interest and that issues underwritten by banks that are also venture capital investors don't perform worse than other issues after the IPO.

In summary, evidence from the US favors the certification hypothesis, supporting the idea that banks possess and use private information deriving from their loan activity to reduce information asymmetries.

Finally, Fernando et al. (2012) analyze the impact of investment bank reputation on firms' performance by examining how the Lehman Brothers collapse affected the performance of firms that received underwriting, advisory, analyst and market-making services from Lehman. They find that the only firms that were adversely affected by the Lehman Brothers collapse were the ones that had the bank as underwriter and losses were particularly high for those with stronger underwriting relationships.

If US evidence is particularly strong in supporting the certification effect, international evidence is limited, fragmented and equivocal.

Ber et al. (2001) study costs and benefits of universal banking on the Israeli market and find that IPOs underwritten by banks with prior lending relationships are overpriced, although their average post-issue accounting profitability is significantly better than average. IPO overpricing appears even stronger when the bank acts as a universal bank and combines underwriting securities and fund management, resulting in bank managed funds paying too

much for bank underwritten IPOs, at the expense of the investors in the funds. They interpret this pattern as a primarily evidence of a conflict of interest in the combination of bank lending, underwriting and fund management, although they also find evidence for certification when IPOs underwritten by banks with prior lending relationships exhibit above average post-issue accounting performance.

Due to the limited international literature, we extend the research to underwriters also acting as venture capitalist, since having a stake in the firm through a venture capital subsidiary poses conflicts for the underwriting bank analogous to having a pre-IPO lending relationship (Gompers and Lerner, 1999).

Bessler and Kurth (2007) analyze the differences between VC-backed IPOs where the underwriter also acts as venture capitalist and other VC-backed IPOs in Germany and find that the former are more underpriced than the latter, suggesting the existence of serious agency problems in the going public process.

Evidence from VC-backed IPOs in Japan shows that firms backed by underwriters' venture capital subsidiaries report higher underpricing than other VC-backed IPOs, although they do not perform significantly worse over a 3-year time horizon than other IPOs, suggesting that conflicts of interest influence the initial pricing, but not the long-term performance, of IPOs in Japan (Hamao et al., 2000).

Finally, a comparative study led in West Africa, finds that underpricing and cost of equity are larger in common law as opposed to civil law origin markets and in IPOs where firms hire their existing bank as underwriter (Hearn, 2011).

This paper focuses on Italy, where we can access unique data provided by the Milan Stock Exchange (Borsa Italiana). The Italian market can be particularly useful to examine these hypotheses. First, lending relationships assume greater importance in the Italian market than in the Anglo-Saxon markets. Second, the Italian market has an institutional setting similar to most European countries and opposite to the Anglo-Saxon financial system, the former being a bank-centered system and the latter characterized by well-developed equity markets. The Italian economy is an economy in which financial markets have a very limited importance, while financial intermediaries such as banks, pension funds and insurance companies are dominant. Conversely, the Anglo-Saxon economy is an economy in which financial markets are dominant and financial intermediaries are less important.

While in European and Asian nations existing empirical evidence indicates that the conflict of interest effect is much stronger and often dominates the certification effect, in the US market

evidence is consistent with the certification hypothesis.

In 1936, the fear that universal banking might lead to potential conflicts of interest introduced a system similar to the American Glass-Steagall Act in the Italian contest. The division between commercial banks and investment banks was finally eliminated by the banking Act of 1993 (Testo Unico Bancario) and a study of the certification and conflict of interest hypotheses on the Italian market can contribute to the debate regarding the 1993 reform.

As far as we are aware, this is the first study to investigate the certification and conflict of interest hypotheses when the IPO underwriter has pre-existing lending relationships with the issuer in the Italian market and one of the few in the European contest. Another important contribution of this study is the period of analysis. By analyzing the 2003-2009 period, we isolate the "bubble" years (1999-2000) and its subsequent effects (2001-2002). We model the existence of a lending relationship with a dummy variable that equals one if the underwriter is also lender to the firm at the time of IPO, zero otherwise (Ber et al., 2001; Hebb, 2002; Schenone, 2004; Benzoni and Schenone, 2010; Hearn, 2011; Chen et al., 2014).

We examine four characteristics of IPOs underwritten by lending-relationship banks: underpricing, price revision and long-term performance at two and four years following the IPO.

IPO underpricing is the dominant indicator of IPO performance in literature (Ritter, 1998; Daily et al., 2003) and is measured by the percentage change between the offering price and the first trading day close price. Underpricing is used to reduce the information asymmetry problem surrounding IPOs (Beatty and Ritter, 1986; Rock, 1986). Market investors facing higher levels of uncertainty regarding the firm's performance will purchase the firm's shares only at a discount to the expected value of the share price. Hence, firms must find mechanisms (signals) for communicating their quality to the market in order to attract investors and, at the same time, reduce the share price discount (e.g., Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989). The prediction of the two hypotheses for the IPO underpricing is the following. For the certification hypothesis, investors' demand should be high when the underwriter is also lender to the firm due to the superior access to issuer information granted to the bank. Thus, the certification hypothesis supports higher IPO offer prices and reduced underpricing.

Hypothesis 1a: If the certification hypothesis dominates, IPOs with lending relationships will show lower underpricing.

On the opposite, for the conflict of interest hypothesis investors require offer price discounts or greater IPO underpricing as a result of conflicts of interest created by the lending

relationship.

Hypothesis 1b: If the conflict of interest hypothesis dominates, IPOs with lending relationships will show higher underpricing.

We next evaluate the two hypotheses for IPO offer price revision, measured by the offer price minus the filing price range midpoint scaled by the same midpoint in percentage.

Offer price revision is only possible for IPOs with a book building mechanism, the alternative being fixed offer price. Book building is a common practice in developed countries and refers to the process of recording investor demand for shares at various prices, which are within the price range specified by the issuer in the prospectus. The final offer price is set after the close of the book building period and is based on the demand generated in the process. Book building is used by underwriters to reduce the information asymmetries surrounding the IPO and stimulates investors to disclose information (Benveniste and Spindt, 1989). Under the certification hypothesis, investors rely on the certification role of the lending bank and their demand for the new shares is high. The underwriter will set the offer price in the higher part of the filing range, leading to a positive price revision.

Hypothesis 2a: If the certification hypothesis dominates, IPOs with lending relationships will show positive price revisions.

Under the conflict of interest hypothesis, underwriters with lending relationship are prone to underwrite riskier and financially weaker IPOs. Fearing the potential conflict, investors will require a discount of the share price. The offer price will be set either near or under the filing range midpoint, leading to a near zero or negative price revision, respectively.

Hypothesis 2b: If the conflict of interest hypothesis dominates, IPOs with lending relationships will show null or negative price revisions.

Because other differences across IPOs could affect the degree of underpricing and price revisions, we also control for a variety of issuer and IPO characteristics.

Based on the evidence from Gonzalez and James (2007) that pre-IPO lending relationships positively affect post-IPO performance, we also examine stock long-run performance. We use the market-to-book ratio at two and four years following the IPO. Several researches employ the market-to-book ratio as a measure of firm performance (Yermack, 1996; La Porta et al., 2002), because it has the advantage of not requiring estimates of long-run abnormal stock price performance, which are highly sensitive to the benchmark used (Fama, 1998). The market-to-book ratio, also known as the Tobin's Q, is equal to the ratio of a firm's market

value of equity to the book value of equity and expresses how much a firm is worth with regard to its book value. This ratio gives an idea of what the firm's investors think of the firm's actual and future performance. If the firm is valuable and financials are good, then market-to-book ratio should be high, otherwise it should be low. The certification hypothesis prediction is ambiguous: on one side, higher market-to-book ratios for IPOs with lending relationships are expected due to their superior information; on the other side, market-to-book ratios of IPOs with lending relationships can be similar to other IPOs due to the fact that the first group of underwriters tend to underwrite riskier IPOs thanks to the superior information they have.

Hypothesis 3a: If the certification hypothesis dominates, the effect of IPOs with lending relationships on market-to-book-ratio is ambiguous.

Under the conflict of interest hypothesis a lower market-to-book ratio for IPOs with lending relationship is expected, due to underwriters' lower origination standards, which make banks underwrite low-quality firms.

Hypothesis 3b: If the conflict of interest hypothesis dominates, IPOs with lending relationships will show lower market-to-book ratios.

3. DATA AND METHOD

3.1.Sample and data sources

The investigation is focused on the Italian market. We manually compiled a database of all IPOs on the Italian Stock Exchange over the period 2003-2009. The examination period has been chosen in order to isolate the "bubble" years (1999-2000) and its subsequent effects (2001-2002), and to have market and accounting data for the market-to-book-ratio at 2 and 4 years after the IPO. To select the sample we excluded those filed by financial institutions, by companies that were already listed on other foreign stock exchanges and by firms with incomplete information about the offer and the aftermarket. In order to study the effects over price revision, we only included IPOs conducted with a book building mechanism. The sample is made of 58 IPOs, out of which 32 had lending relationships.

Data have been collected from several sources:

- data on the issuing characteristics from offerings prospectuses;
- data on IPOs from the Italian Stock Exchange website (http://www.borsaitaliana.it);
- stock prices from the website "Finanza Aperta" (http://www.finanza-aperta.it);
- accounting data from the issuer's financial statements.

The software used for the statistical analysis is IBM SPSS Statistics.

3.2.Underpricing, Price Revision, Market-to-Book Ratio

3.2.1. Underpricing (UP)

We calculated underpricing using the formula (P_1 - OP)/OP, where P_1 is the market price at the end of the first trading day and OP is the IPO offering price.

3.2.2. Price Revision (PR)

Price revision is calculated using the following formula: (OP-Midpoint of Initial Filing Range)/Midpoint of Initial Filing Range.

3.2.3. Market-to-Book Ratio After 2 Years (MB_2_yrs)

Ratio of issuer's market value of equity to its book value of equity 2 years after IPO: Market value of Equity after 2 years/Book value of Equity after 2 years.

3.2.4. Market-to-Book Ratio After 4 Years (MB_4_yrs)

Ratio of issuer's market value of equity to its book value of equity 4 years after IPO: Market value of Equity after 4 years /Book value of Equity after 4 years.

3.3.Lending Relationship

3.3.1. Lending Bank (LB)

The independent variable is LENDING BANK, a dummy variable that takes the value of 1 if the bank has a prior lending relationship with the issuer at the time of IPO, 0 otherwise. Information on the lending relationship is gathered from the IPO prospectus (Hebb, 2002; Duarte-Silva, 2010; Hearn, 2011), which states if there are potential conflicts of interest with the underwriter deriving from a lending relationship.

3.4.Control variables

3.4.1. Debt ratio (DR)

It is the ratio of total bank debt to total assets. Both numbers are taken at the last date available before the IPO. Bank debt before the IPO should lead to lower underpricing, as it signals to the market that the firm is of high value (James and Wier, 1990; Schenone, 2004).

3.4.2. Shares Offered (SO)

It is the ratio of the number of shares offered by the total number of shares after the IPO. The total number of shares after the IPO includes the number of primary shared offered during the

IPO and the number of existing shares before the IPO. This ratio has a negative impact on underpricing (Li and Masulis, 2004).

3.4.3. Secondary Shares Offered (SSO)

The ratio of the number of secondary shares offered by the number of shares offered. This ratio represents the existing shares sold by pre-IPO shareholders during the offer and has a negative effect on underpricing, as investors may fear that shareholders want to get rid of the investment in the firm.

3.4.4. Age (LN_Age)

We used the natural logarithm of the age of the firm at IPO as a control for the degree of information asymmetry (Ln (1+age)). Age is defined as the calendar year of offering minus the calendar year of founding. Thus, a 2-year old firm may be anywhere from 13 months old to 35 months old. We expect that older firms have a lower degree of information asymmetry compared to younger firms (Beatty and Ritter, 1986).

3.4.5. Underwriter reputation (UWREP)

Market share is commonly used in the academic literature as a proxy for underwriter reputation (Megginson and Weiss, 1991; Dunbar, 2000; Aussenegg et al., 2006; Chemmanur and Krishnan, 2012; Boreiko and Lombardo, 2013)[9]. The intuition behind this approach is that banks are credible certifiers because their future economic rents depend on the accuracy of the information produced during IPOs. Economic rents, market shares and reputation are, then, correlated. Boreiko and Lombardo (2013) are the first to apply this approach to the Italian market. Market share is calculated as the percentage of the total IPO value brought to the market over the entire sample period (2003-2009) [10].

3.4.6. Private Equity backing (PE)

A dummy variable that equals one if the firm is backed by a private equity firm at the time of the offering, zero otherwise. Private equity firms should certify to the market the quality of the firms backed, resulting in a lower underpricing.

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9 The majority of US studies use the Carter and Manaster reputation ranking system (Carter and Manaster, 1990), where underwriters are ranked based on their position in tombstone announcements. This method cannot be used in the Italian system due to the fact that the majority of the underwriters of Italian IPOs have not been active in the US IPO market.

10 Following Simon (1989), if 2 investment bankers are listed as co-managers, the proceeds of the issue are split equally between them. Thereafter, the average of the lead underwriters' market share is used as the measure of reputation (Megginson and Weiss, 1991). Transactions advised by an advisor that later merged with another advisor have been credited to the ultimately emerging entity only if the merger between those entities took place in the period under consideration (Schiereck et al., 2009).

The control variable size, expressed by the gross proceeds from the offering, which is very used in literature, has been excluded from the analysis due to strong collinearity problems.

3.5. Model

The model used is the Ordinary Least Squares, which is the most robust, from a mathematical point of view.

The four OLS regression models take the following general mathematical formulation:

$$Y_{UP} = a + b_1 X_{LB} + b_2 X_{DR} + b_3 X_{SO} + b_4 X_{SSO} + b_5 X_{UWREP} + b_6 X_{PE} + b_7 X_{LN\_Age},$$

$$Y_{PR} = a + b_1 X_{LB} + b_2 X_{DR} + b_3 X_{SO} + b_4 X_{SSO} + b_5 X_{UWREP} + b_6 X_{PE} + b_7 X_{LN\_Age},$$

$$Y_{MB\_2\_yrs} = a + b_1 X_{LB} + b_2 X_{DR} + b_3 X_{SO} + b_4 X_{SSO} + b_5 X_{UWREP} + b_6 X_{PE} + b_7 X_{LN\_Age},$$

and

$$Y_{MB\_4\_yrs} = a + b_1 X_{LB} + b_2 X_{DR} + b_3 X_{SO} + b_4 X_{SSO} + b_5 X_{UWREP} + b_6 X_{PE} + b_7 X_{LN\_Age},$$

where bi (i= 1, 2, 3, 4, 5, 6,7) indicates the regression coefficient.

4. RESULTS

Table 21 presents the descriptive statistics. The average underpricing is 7.27, therefore the first-day closing price tends to be higher than the offer price. The average price revision is negative and equal to -2.55. In both cases, although, the dispersion from the average, expressed by the standard deviation, is very high, meaning that average is not a particularly relevant central tendency. Average market-to-book ratios at 2 and 4 years after IPO are 2.16 and 1.63, respectively, meaning that, in general, market value is twice as much the book value 2 years after the IPO, before falling to around 1.5 times 4 years after the IPO.

The independent variable is represented by the lending bank (LB) and is a dummy variable which takes the value of 1 is the firm had a lending relationship with the underwriter before the IPO, zero otherwise. In the sample, 32 firms out of 58 had a lending relationship, representing about the 55%.

Regarding the control variables, the debt ratio (DR) has an average of 25%, meaning that bank debts account for about a quarter of total assets. The percentage of shares offered (SO) is around 33% while the percentage of existing shares sold by pre-IPO shareholders (SSO) is higher and around 42%. It is not easy to interpret the average value of LN_Age. Referring to

the data originally used for the calculation of this variable, it can be noted that the average time for a firm to go public is relatively long (17.5 years), although the variability is very high (standard deviation of about 13.5 years). The average underwriter market share (UWREP) is 14%, with a maximum value of around 39%, although this information it is not particularly explanatory given its wide dispersion. Finally, about 43% of the firms were private equity-backed.

Table 21: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
UP	58	-13,33	38,57	7,2710	10,99283	1,078	,314	1,246	,618
PR	58	-32,12	12,71	-2,5540	8,51780	-,604	,314	1,258	,618
MB_2_yrs	58	,00	10,99	2,1567	1,84023	2,562	,314	9,174	,618
MB_4_yrs	58	-3,02	8,53	1,6298	1,54275	1,376	,314	7,077	,618
DR	58	,00	,55	,2534	,14702	,098	,314	-,767	,618
SO	58	10,00	61,00	33,5345	9,69213	-,020	,314	,718	,618
SSO	58	,00	100,00	41,6897	39,71354	,368	,314	-1,541	,618
LN_Age	58	,69	4,30	2,5397	,87392	-,401	,314	-,598	,618
UWREP	58	,19	38,65	14,0133	11,48742	,459	,314	-,831	,618
Valid N (listwise)	58								

4.1.Short-run analysis

4.1.1. Lending relationship and UP

Statistical units with anomalous values of the UP were excluded, resulting in a sample of 55 firms.

Table 22 presents the correlation matrix between the independent variables and the dependent variable UP. As can be inferred, there is a significant and negative relationship between LB and UP, which supports the subsequent verification of the hypothesis H1a (certification effect). No significant correlations emerge among the other variables.

Table 22: Correlation matrix with the dependent variable UP

		UP	LB	DR	SO	SSO	LN_Age	UWREP	PE
UP	Pearson Correlation	1	-,275*	-,094	-,092	-,154	-,004	,020	,096
	Sig. (2-tailed)		,042	,493	,506	,262	,975	,882	,487
	N	55	55	55	55	55	55	55	55
LB	Pearson Correlation	-,275*	1	,289*	,135	-,046	-,053	-,052	,256
	Sig. (2-tailed)	,042		,032	,324	,736	,701	,706	,060
	N	55	55	55	55	55	55	55	55
DR	Pearson Correlation	-,094	,289*	1	,166	-,191	-,270*	-,143	,124
	Sig. (2-tailed)	,493	,032		,225	,162	,046	,298	,365
	N	55	55	55	55	55	55	55	55
SO	Pearson Correlation	-,092	,135	,166	1	,223	-,205	,163	,095
	Sig. (2-tailed)	,506	,324	,225		,102	,133	,235	,490
	N	55	55	55	55	55	55	55	55
SSO	Pearson Correlation	-,154	-,046	-,191	,223	1	-,122	,274*	,021
	Sig. (2-tailed)	,262	,736	,162	,102		,373	,043	,878
	N	55	55	55	55	55	55	55	55
LN_Age	Pearson Correlation	-,004	-,053	-,270*	-,205	-,122	1	-,029	-,116
	Sig. (2-tailed)	,975	,701	,046	,133	,373		,836	,397
	N	55	55	55	55	55	55	55	55
UWREP	Pearson Correlation	,020	-,052	-,143	,163	,274*	-,029	1	,221
	Sig. (2-tailed)	,882	,706	,298	,235	,043	,836		,105
	N	55	55	55	55	55	55	55	55
PE	Pearson Correlation	,096	,256	,124	,095	,021	-,116	,221	1
	Sig. (2-tailed)	,487	,060	,365	,490	,878	,397	,105	
	N	55	55	55	55	55	55	55	55

*. Correlation is significant at the 0.05 level (2-tailed).

Tables 23 and 24 present a summary of the model and the resulting analysis of variance (ANOVA) required for the verification of the significance of the coefficient of determination R^2.

Table 23: Model Summary with the dependent variable UP

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,375[a]	,141	,013	8,55555	1,679

a. Predictors: (Constant), LN_Age, UWREP, LB, SO, SSO, PE, DR

Table 24: ANOVA with the dependent variable UP

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	562,522	7	80,360	1,098	,380[b]
	Residual	3440,282	47	73,197		
	Total	4002,804	54			

b. Predictors: (Constant), LN_Age, UWREP, LB, SO, SSO, PE, DR

The adjusted R^2 is almost zero and not significant, meaning that the set of independent variables cannot explain the variability of the dependent variable UP. The value of the Durbin-Watson index shows a slight positive autocorrelation among the errors.

Table 25: Results from Ordinary Least Square Regression with the dependent variable UP

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	11,697	6,653		1,758	,085	-1,687	25,081		
	LB	-5,286	2,509	-,309	-2,106	,041	-10,334	-,237	,852	1,173
	DR	-4,177	9,003	-,071	-,464	,645	-22,289	13,934	,779	1,284
	SO	-,021	,128	-,024	-,166	,869	-,279	,237	,866	1,154
	SSO	-,041	,032	-,188	-1,273	,209	-,105	,024	,837	1,195
	UWREP	,006	,109	,008	,056	,956	-,213	,225	,845	1,183
	PE	3,157	2,514	,183	1,256	,215	-1,899	8,214	,866	1,155
	LN_Age	-,445	1,393	-,046	-,320	,751	-3,248	2,357	,874	1,145

Table 25 presents the regression coefficients, the statistical significance testing, the 95% confidence intervals, and the collinearity indices, which confirm the absence of significant collinearity among the variables.

The regression model takes the following specific form:

$$Y_{UP} = 11.697 - 5.286X_{LB} - 4.177X_{DR} - 0.021X_{SO} - 0.041X_{SSO} + 0.006X_{UWREP} + 3.157X_{PE} - 0.445X_{LN\_Age}$$

The relationship between LB and UP is statistically significant at 5% (p-value=0.041) and inverse, therefore, the hypothesis H1a is verified. The presence of a lending relationship between the issuing firm and the underwriter works as a certificatory for the investors, which require a lower underpricing.

No other regression coefficient is statistically significant. The following weak relationships are observed: inverse with the variables DR and SSO and direct with the variable PE. The remaining control variables show no dependence.

The hypotheses behind the OLS model are verified. In particular, this method requires the verification of three hypotheses about the residuals:

1. The average of the residuals is zero, i.e. errors are distributed normally;
2. No correlation between the residuals and the independent variables;
3. Homogeneity of variance (the so-called hypothesis of "homoscedasticity").

From the analyses conducted separately, residuals distribution's is approximately normal, they distribute randomly (the points are distributed equally above and below the horizontal

axis, and there is no evidence of some systematic behavior), and the distance of the points from the horizontal axis does not seem to depend from the expected values of the dependent variable.

4.1.2. Lending relationship and PR

After eliminating one firm with an anomalous value of the PR, the sample is made of 57 firms. Table 26 presents the correlation matrix between the independent variables and the dependent variable PR, which does not show significant relationships. The negative sign of the correlation coefficient of the variable LB, however, suggests the likelihood of a dominance of the conflict of interest effect, in line with the hypothesis H2b (conflict of interest effect).

Table 26: Correlation matrix with the dependent variable PR

		PR	LB	DR	SO	SSO	UWREP	PE	LN_Age
PR	Pearson Correlation	1	-,125	-,055	-,045	,086	,235	,099	,092
	Sig. (2-tailed)		,353	,682	,739	,525	,079	,466	,496
	N	57	57	57	57	57	57	57	57
LB	Pearson Correlation	-,125	1	,275*	,138	-,003	-,032	,211	-,056
	Sig. (2-tailed)	,353		,038	,304	,983	,814	,115	,679
	N	57	57	57	57	57	57	57	57
DR	Pearson Correlation	-,055	,275*	1	,126	-,170	-,161	,144	-,267*
	Sig. (2-tailed)	,682	,038		,350	,206	,232	,285	,045
	N	57	57	57	57	57	57	57	57
SO	Pearson Correlation	-,045	,138	,126	1	,258	,180	,073	-,209
	Sig. (2-tailed)	,739	,304	,350		,052	,180	,588	,119
	N	57	57	57	57	57	57	57	57
SSO	Pearson Correlation	,086	-,003	-,170	,258	1	,294*	,045	-,095
	Sig. (2-tailed)	,525	,983	,206	,052		,026	,739	,481
	N	57	57	57	57	57	57	57	57
UWREP	Pearson Correlation	,235	-,032	-,161	,180	,294*	1	,182	-,031
	Sig. (2-tailed)	,079	,814	,232	,180	,026		,175	,819
	N	57	57	57	57	57	57	57	57
PE	Pearson Correlation	,099	,211	,144	,073	,045	,182	1	-,127
	Sig. (2-tailed)	,466	,115	,285	,588	,739	,175		,345
	N	57	57	57	57	57	57	57	57
LN_Age	Pearson Correlation	,092	-,056	-,267*	-,209	-,095	-,031	-,127	1
	Sig. (2-tailed)	,496	,679	,045	,119	,481	,819	,345	
	N	57	57	57	57	57	57	57	57

*. Correlation is significant at the 0.05 level (2-tailed).

The model summary and the analysis of variance (tables 27 and 28) show an adjusted R^2 around zero and not significant. Also in this case, the set of independent variables is not able to explain the variability of the dependent variable. The Durbin-Watson index assumes a value of 1.679, showing a slight positive autocorrelation among the errors.

Table 27: Model Summary with the dependent variable PR

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,305[a]	,093	-,036	7,75002	1,679

a. Predictors: (Constant), LN_Age, UWREP, LB, SO, PE, SSO, DR

Table 28: ANOVA with the dependent variable PR

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	302,949	7	43,278	,721	,655[b]
	Residual	2943,080	49	60,063		
	Total	3246,029	56			

b. Predictors: (Constant), LN_Age, UWREP, LB, SO, PE, SSO, DR

The regression model takes the following specific form:

$$Y_{PR} = -5.184 - 2.075X_{LB} + 2.600X_{DR} - 0.055X_{SO} + 0.010X_{SSO} + 0.146X_{UWREP} + 1.466X_{PE} + 0.936X_{LN\_Age}$$

Table 29: Results from Ordinary Least Square Regression with the dependent variable PR

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-5,184	6,035		-,859	,394	-17,311	6,943		
	LB	-2,075	2,205	-,136	-,941	,351	-6,505	2,356	,880	1,136
	DR	2,600	7,898	,050	,329	,743	-13,272	18,472	,793	1,261
	SO	-,055	,114	-,071	-,482	,632	-,285	,175	,858	1,166
	SSO	,010	,028	,053	,358	,722	-,047	,067	,836	1,196
	UWREP	,146	,097	,221	1,497	,141	-,050	,341	,848	1,179
	PE	1,466	2,183	,096	,671	,505	-2,921	5,852	,898	1,113
	LN_Age	,936	1,265	,107	,740	,463	-1,606	3,478	,880	1,137

No regression coefficient is statistically significant. Descriptively, the sign of the partial regression coefficient between the independent variable LB and PR is negative, in favor of the hypothesis H2b although, as repeated, the relationship is not statistically significant.

With reference to the other variables, they all present weak and positive relationships, except for the variable UWREP which shows a stronger and positive relationship and the variable SO which presents a negative relationship.

In a separate analysis we verified that OLS residuals properties are respected.

4.2.Long-run analysis

4.2.1. Lending relationship and MB_2_yrs

Compared to previous models, the emphasis is now placed on the stock long-run performance. The independent variables are the same and the model is made of 55 firms, having eliminated three units with anomalous values.

The correlation matrix (table 30) shows no statistically significant correlations between the independent variables and the dependent variable. The table presents negative sign for the variable LB (-0.22), in favor of the hypothesis H3b (conflict of interest effect).

Table 30: Correlation matrix with the dependent variable MB_2_yrs

		MB_2_yrs	LB	DR	SO	SSO	UWREP	PE	LN_Age
MB_2_yrs	Pearson Correlation	1	-,222	,110	-,006	,116	-,126	-,112	-,095
	Sig. (2-tailed)		,104	,423	,964	,400	,360	,415	,492
	N	55	55	55	55	55	55	55	55
LB	Pearson Correlation	-,222	1	,310*	,145	,069	-,035	,270*	-,089
	Sig. (2-tailed)	,104		,021	,292	,619	,800	,046	,517
	N	55	55	55	55	55	55	55	55
DR	Pearson Correlation	,110	,310*	1	,139	-,205	-,140	,161	-,237
	Sig. (2-tailed)	,423	,021		,313	,133	,308	,240	,082
	N	55	55	55	55	55	55	55	55
SO	Pearson Correlation	-,006	,145	,139	1	,269*	,186	,055	-,203
	Sig. (2-tailed)	,964	,292	,313		,047	,173	,689	,137
	N	55	55	55	55	55	55	55	55
SSO	Pearson Correlation	,116	,069	-,205	,269*	1	,320*	-,014	-,050
	Sig. (2-tailed)	,400	,619	,133	,047		,017	,921	,718
	N	55	55	55	55	55	55	55	55
UWREP	Pearson Correlation	-,126	-,035	-,140	,186	,320*	1	,208	-,051
	Sig. (2-tailed)	,360	,800	,308	,173	,017		,127	,712
	N	55	55	55	55	55	55	55	55
PE	Pearson Correlation	-,112	,270*	,161	,055	-,014	,208	1	-,073
	Sig. (2-tailed)	,415	,046	,240	,689	,921	,127		,598
	N	55	55	55	55	55	55	55	55
LN_Age	Pearson Correlation	-,095	-,089	-,237	-,203	-,050	-,051	-,073	1
	Sig. (2-tailed)	,492	,517	,082	,137	,718	,712	,598	
	N	55	55	55	55	55	55	55	55

*. Correlation is significant at the 0.05 level (2-tailed).

The model summary and the analysis of variance (tables 31 and 32) show an adjusted R^2 around zero and not significant. The Durbin-Watson index has a value of 1.960, very close to 2, indicating the absence of autocorrelation among the residuals.

Table 31: Model Summary with the dependent variable MB_2_yrs

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,392[a]	,154	,028	1,09223	1,960

a. Predictors: (Constant), LN_Age, SSO, PE, LB, SO, UWREP, DR

Table 32: ANOVA with the dependent variable MB_2_yrs

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10,173	7	1,453	1,218	,312[b]
	Residual	56,070	47	1,193		
	Total	66,243	54			

b. Predictors: (Constant), LN_Age, SSO, PE, LB, SO, UWREP, DR

The regression model is the following:

$$Y_{MB\_2\_yrs} = 2.199 - 0.683X_{LB} + 1.649X_{DR} - 0.005X_{SO} + 0.007X_{SSO} - 0.016X_{UWREP} - 0.065X_{PE} - 0.097X_{LN\_Age}$$

Table 33: Results from Ordinary Least Square Regression with the dependent variable MB_2_yrs

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2,199	,842		2,611	,012	,505	3,893		
	LB	-,683	,329	-,307	-2,076	,043	-1,344	-,021	,824	1,213
	DR	1,649	1,124	,223	1,467	,149	-,612	3,909	,776	1,289
	SO	-,005	,016	-,040	-,277	,783	-,037	,028	,849	1,178
	SSO	,007	,004	,245	1,625	,111	-,002	,016	,792	1,262
	UWREP	-,016	,014	-,174	-1,170	,248	-,045	,012	,816	1,225
	PE	-,065	,322	-,029	-,201	,842	-,713	,584	,859	1,165
	LN_Age	-,097	,179	-,076	-,541	,591	-,456	,263	,910	1,099

Table 33 shows that there negative relationship between the dependent variable and LP is statistically significant at 5% (p-value=0.043), supporting the hypothesis H3b. After 2 years from the IPO, the conflict of interest effect prevails, leading to performance deterioration.
Direct relationships between variables DR and SSO and the dependent variable are observed, although they are not statistically significant. In addition, there are inverse relations, not statistically significant, between the variables UWREP and LN_Age and the dependent variable MB_2_yrs. The remaining two independent variables SO and PE are independent on average.

OLS residuals properties have been verified and are respected.

4.2.2. Lending relationship and MB_4_yrs

In this model three firms were excluded due to anomalous values of MB_4_yrs, resulting in a sample of 55 firms.

Table 34 presents the correlation matrix, where an inverse correlation, significant at 1%, between the independent variable LB and the dependent variable appears, suggesting the dominance of the hypothesis H3b (conflict of interest effect).

A significant and direct correlation, always at 1%, is between SSO and the dependent variable.

Table 34: Correlation matrix with the dependent variable MB_4_yrs

		MB_4_yrs	LB	DR	SO	SSO	UWREP	PE	LN_Age
MB_4_yrs	Pearson Correlation	1	-,389**	-,211	-,201	,412**	-,084	-,021	-,175
	Sig. (2-tailed)		,003	,122	,141	,002	,540	,877	,200
	N	55	55	55	55	55	55	55	55
LB	Pearson Correlation	-,389**	1	,243	,139	,017	,010	,246	,023
	Sig. (2-tailed)	,003		,074	,313	,902	,942	,071	,866
	N	55	55	55	55	55	55	55	55
DR	Pearson Correlation	-,211	,243	1	,142	-,146	-,130	,182	-,202
	Sig. (2-tailed)	,122	,074		,302	,288	,343	,185	,139
	N	55	55	55	55	55	55	55	55
SO	Pearson Correlation	-,201	,139	,142	1	,274*	,224	,060	-,195
	Sig. (2-tailed)	,141	,313	,302		,043	,101	,661	,154
	N	55	55	55	55	55	55	55	55
SSO	Pearson Correlation	,412**	,017	-,146	,274*	1	,263	,019	-,176
	Sig. (2-tailed)	,002	,902	,288	,043		,052	,888	,199
	N	55	55	55	55	55	55	55	55
UWREP	Pearson Correlation	-,084	,010	-,130	,224	,263	1	,201	-,078
	Sig. (2-tailed)	,540	,942	,343	,101	,052		,141	,569
	N	55	55	55	55	55	55	55	55
PE	Pearson Correlation	-,021	,246	,182	,060	,019	,201	1	-,159
	Sig. (2-tailed)	,877	,071	,185	,661	,888	,141		,248
	N	55	55	55	55	55	55	55	55
LN_Age	Pearson Correlation	-,175	,023	-,202	-,195	-,176	-,078	-,159	1
	Sig. (2-tailed)	,200	,866	,139	,154	,199	,569	,248	
	N	55	55	55	55	55	55	55	55

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The model summary and the analysis of variance (tables 35 and 36) show an adjusted R^2 of 0.379, which is statistically significant (p-value = 0). Therefore, the set of independent variables explains the 37.9% of the variability of the dependent variable MB_4_yrs. The Durbin-Watson index has a value very close to 2, indicating the absence of autocorrelation among the residuals.

Table 35: Model Summary with the dependent variable MB_4_yrs

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,678[a]	,459	,379	,80344	1,854

a. Predictors: (Constant), LN_Age, LB, UWREP, SSO, PE, SO, DR

Table 36: ANOVA with the dependent variable MB_4_yrs

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25,767	7	3,681	5,702	,000[b]
	Residual	30,339	47	,646		
	Total	56,106	54			

b. Predictors: (Constant), LN_Age, LB, UWREP, SSO, PE, SO, DR

The regression model takes the following specific form:

$$Y_{MB\_4\_yrs} = 3.058 - 0.728X_{LB} - 0.623X_{DR} - 0.028X_{SO} + 0.013X_{SSO} - 0.017X_{UWREP} + 0.215X_{PE} - 0.176X_{LN\_Age}$$

Table 37: Results from Ordinary Least Square Regression with the dependent variable MB_4_yrs

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	3,058	,631		4,848	,000	1,789	4,328		
	LB	-,728	,232	-,360	-3,135	,003	-1,195	-,261	,873	1,145
	DR	-,623	,846	-,087	-,736	,465	-2,324	1,078	,818	1,223
	SO	-,028	,012	-,267	-2,281	,027	-,052	-,003	,839	1,192
	SSO	,013	,003	,502	4,278	,000	,007	,019	,834	1,199
	UWREP	-,017	,010	-,198	-1,692	,097	-,038	,003	,844	1,186
	PE	,215	,236	,106	,913	,366	-,259	,690	,858	1,165
	LN_Age	-,176	,137	-,147	-1,283	,206	-,451	,100	,876	1,141

Several regression coefficients are statistically significant.

First of all, there is a significant and inverse relationship with the variable LB at 1% (p-value=0.003). Therefore, the hypothesis H3b is verified (conflict of interest effect).

In addition, the following significant relationships are reported:

- an inverse and significant relationship at 5% (p-value=0.027) between SO and MB_4_yrs;
- a direct and significant relationship at 1% (p-value=0) between SSO and MB_4_yrs;

- an inverse and significant relationship at 10% (p-value=0.097) between UWREP and MB_4_yrs.

Only descriptively, there are inverse relationships between the variables DR and LN_Age and the dependent variable and a direct relationship between PE and MB_4_yrs.

As with the other models, OLS residuals properties have been verified and are respected.

5. DISCUSSION

When going public, firms can decide to reduce the information asymmetry problem surrounding their offering by appointing, as underwriter, a bank with which it already has a lending relationship. In this case, the underwriter acts as a certifier of the value of the issue. But information asymmetries can also get worse if the market fears that the lending bank might try to misuse the private information acquired through its lending activity to advantage itself. In this paper we test these opposite hypotheses in the Italian market: namely, certification vs. conflict of interest. Results shown in Section 4 show that the existing lending relationship with the IPO underwriter can significantly reduce IPO underpricing. In particular, the lending relationship reduces underpricing of a value of 5.286, so, for example, an underpricing of 10% reduces to 4.714% (10%-5.286%) if there is a lending relationship. At first sight, this result confirms a certification effect on the Italian market. Underwriters that are also lenders know better than others their borrowers and put their reputation at stake by certifying the borrowers' value. Investors rely on the certification role of underwriters, requiring lower underpricing. This result, taken alone, aligns the Italian financial system to the North American system and works in favor of firms trying to signal their value to the market. Previous research conducted on US data shows a predominance of the certification effect over the conflict of interest effect (e.g. Hebb, 2002; Schenone, 2004; Duarte-Silva, 2010). In the United States this result is explained by the great efficiency of the financial and equity markets.

The result of a pre-IPO lending relationship supporting the certification hypothesis in Italy is somewhat surprising. In fact, European and Asian results are more towards a prevalence of the conflict of interest hypothesis (e.g. Hamao et al., 2000; Ber et al., 2001; Bessler and Kurth, 2007) and the Italian market has an institutional setting similar to most European countries and opposite to the Anglo-Saxon financial system, the former being a bank-centered system and the latter characterized by well-developed equity markets. For this reason, we broadened the analysis to see whether the certification effect holds in the long run. Indeed, the analysis

conducted over the market-to-book ratio at 2 and 4 years following the IPO shows an opposite trend. The analysis at 2 and 4 years shows that firms that had lending relationships with their underwriters at the time of IPO report lower market-to-book ratios than firms that had no such a lending relationships. In details, the presence of a lending relationship at IPO leads to a reduction in value of 0.683 for MB_2_yrs and 0.728 for MB_4_yrs. Thus, while in the short run firms with lending relationships report higher stock prices than other firms, in the long run their stock prices reduce more than other firms. This evidence highlights the fact that the Italian equity market is still young and probably inefficient under this point of view. When a firm goes public, market investors positively value the presence of a lending bank as underwriter. Then, the conflict of interest effect prevails, meaning that probably issuers brought to the market by lending banks are low quality firms and banks take advantage of private information gained through their lending activities for their personal profit. During IPOs, underwriters fool the public into buying overpriced issues. Due to the low efficiency of the Italian market, investors wrongly pay a higher price (require lower underpricing) for issues underwritten by lending banks and this reveals in the long run, when these stock prices drop more than others.

Although it is not statistically significant, the analysis on the second dependent variable, price revision, suggests the possible presence of a conflict of interest effect already at the time of IPO. In fact, both the regression analysis and the correlation matrix report negative signs for the independent variable LB. This shows the importance of looking at other performance indicators when comparing two opposite hypotheses. Hence the evidence that in European and Asian nations the conflict of interest effect is much stronger and often dominates the certification effect is partially confirmed also for the Italian market, although this is not straightforward due to the low experience of investors, which overpay shares brought to the market by underwriters with lending relationships. This result questions the generalization of theories when institutional environments are different.

In summary, the evidence that international results are rather mixed suggests that discrepancies might be partially explained by the different regulatory environments and quality of the financial markets.

6. CONCLUSION

In this paper we test the opposing "certification" and "conflict of interest" hypotheses when there is a lending relationship between the underwriter and the issuer in the Italian IPO market.

Evidence in the US market shows that when underwriters have also a lending relationship with the issuer of an IPO, the certification hypothesis overcome the conflict of interest hypothesis (e.g. Hebb, 2002; Schenone, 2004; Duarte-Silva, 2010). On the opposite, international evidence and, in particular, results from Israel, Germany, Japan, and Africa, show that the conflict of interest effect is much stronger, often dominating the certification effect (e.g. Hamao et al., 2000; Ber et al., 2001; Bessler and Kurth, 2007; Hearn, 2011). Since evidence from literature is inconsistent, we test both hypotheses. As far as we are aware, this is the first study to pursue this kind of analysis on the Italian market. Although Italy shares some similarities with the German and Japanese markets, as they are all bank-oriented, the Italian market is an even less developed market.

In literature there is a contradistinction between the Anglo-Saxon and the European systems. The former is a market-oriented system, with a well-developed stock market, while the latter is a bank-oriented system, where the banking system is very concentrated. The Anglo-Saxon economy is an economy in which financial markets are dominant and financial intermediaries are less important, while in the European economy financial markets have a very limited importance, while financial intermediaries such as banks, pension funds and insurance companies are dominant. Thus, conducting this type of analysis in a bank-oriented system is of particular interest and can provide some additional understanding of the European contest.

The evidence that international results are rather mixed suggests that discrepancies might be partially explained by the different regulatory environments and quality of the financial markets. This research adds empirical evidence to the rather mixed literature and sheds lights on financial institutions' behavior in a poorly developed financial market. In addition, we find that the consequences arising from the banking Act of 1993 (Testo Unico Bancario), which eliminated the division between commercial and investment banks, have not been negative, at least not at the time of the IPO.

We test the validity of the 2 hypotheses on a sample of IPOs conducted with the book building mechanism on the Italian Stock Exchange over the period 2003-2009. This period allows to isolate the effects deriving from the "bubble" years (1999-2000) and its consequences (2001-2002), and to have market and accounting data for the market-to-book-ratio at 2 and 4 years

after the IPO. The selection of the book building mechanism allows us to study the effects over price revision. We conducted a short-run analysis over underpricing and price revision and a long-run analysis over market-to-book ratio at 2 and 4 years following the IPO. While underpricing is the dominant indicator of IPO performance in literature (Ritter, 1998; Daily et al., 2003), price revision is the revision in the offer price from the midpoint of the filing range and depends on investors' demand generated during the book building period. This mechanism is usually chosen by underwriters to reduce the information asymmetries surrounding the IPO and stimulate investors to disclose information (Benveniste and Spindt, 1989).

The analysis on stock long-run performance is driven by the proof that pre-IPO lending relationships may affect post-IPO performance (Gonzalez and James, 2007). Following literature, we employ the market-to-book ratio (Yermack, 1996; La Porta et al., 2002). The analysis is conducted at 2 and 4 years after the IPO.

With regards to the first hypothesis, we find support for the certification effect, IPOs with lending relationships show lower underpricing. This result is surprising since analysis on bank-oriented countries do not support the certification hypothesis.

A look at the second dependent variable, the price revision, suggests that this result is only partially true. In fact, although the relationship is not significant, descriptively it shows that lending relationship has a negative impact on price revision, which is reflected in the hypothesis H2b. Obviously, this result is only true for my sample and cannot be generalized.

The long-run analysis overturns the prediction of the first hypothesis (prevalence of the certification effect). Both the market-to-book ratios at 2 and 4 years after the IPO present a negative relationship with the independent variable lending relationship, supporting the hypothesis H3b. A lending relationship between the underwriter and the issuer in the Italian IPO market brings to deterioration in future share performance. In particular, the share value of firms, which appointed their lending bank as underwriter at IPO, reduces more after 2 and 4 years than the share value of other firms. This evidence questions the ability of the Italian market to correctly evaluate IPOs and highlights the fact that the Italian equity market is still young and probably inefficient under this point of view.

The results of this study show that, during an IPO, investors positively value the presence of a lending bank as underwriter. The certification role performed by underwriters leads to lower underpricing. After a couple of years, though, the conflict of interest effect prevails and share performance deteriorates. This suggests that underwriters have incentives in bringing low-

value clients to the market and use private information gained through their lending activities for their personal profit. Such actions bear indirect costs, including reputation costs, which don't deter banks from doing so, probably because banks know that Italian investors are still naïve and don't perceive the risk. Therefore, the existence of pre-IPO lending relationships between the underwriter and the firm create moral hazard problems between the underwriter and outside investors, which are fooled and buy overpriced issues. The evidence that investors wrongly require lower underpricing (pay higher price) for issues underwritten by lending banks and these stocks perform worse than others in the long run reveals the poor efficiency of the Italian market.

With this research we aim to contribute to the understanding of this phenomenon in bank-oriented countries and enhancing the understanding of the European environment.

The manifold findings of this paper suggest that firms can take advantage of the lending relationship with their underwriter in order to reduce underpricing and sell overpriced securities. Although, sooner or later, the market recognizes their true value and this leads to a reduction of their share prices. Who gains from this inefficiency are shareholders selling shares at IPO and underwriting banks, which are usually paid with a commission over gross proceeds from the offering. Market investors, instead, suffer twice: at the time of IPO when buying overpriced shares and in the future, when share prices drop.

This issue is very important because it shows that underdevelopment of stock market is a weakness for the economy and a limit for firms' profitability. In the young Italian financial market, investors are not able to fully understand and evaluate the role carried out by underwriters. It would be very interesting to test whether the conjecture that as the financial market becomes more mature, investors learn more and more about the moral hazard problem around underwriters that are also lenders to firms, and that consequently the observed inefficient patterns disappear. Although, some more years have to pass in order to have some more observations and make this analysis feasible.

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CHAPTER III

OWNERSHIP PRE- AND POST-IPOS AND OPERATING PERFORMANCE OF ITALIAN FIRMS

ABSTRACT

Evidence shows that, after an IPO, firms usually report a decline in operating performance. This result is confirmed also for the Italian market. In this paper we investigate if this deterioration is explained by the change in ownership following IPO. In particular, we take into consideration two major dimensions of ownership: a quantitative one, indicating ownership concentration and represented by the stake held by top shareholders, and a qualitative one, about the type of shareholder and relative to the presence of private equity firm both before and after the IPO. The main hypotheses question if there are positive relationships between operating performance and the following dimensions: (i) the stake held by top 3 shareholders before IPO; (ii) its change following IPO; (iii) the presence of private equity firm before IPO; (iv) the presence of private equity firm after IPO. Interestingly, we find that ownership structure positively influences operating performance in the years before IPO, but this is not verified in the years after the IPO, although, in the sample, the relationships are all verified. This is an interesting finding of the paper, which should need further investigation.

1. INTRODUCTION

Firms that have gone public usually exhibit a decline in operating performance (Jain and Kini, 1994; Cai and Wei, 1997; Mikkelson et al., 1997; Pagano et al., 1998). A number of academics have studied the phenomenon: Jain and Kini (1994), and Mikkelson et al. (1997) for the USA; Kurshed et al. (2003), Murray et al. (2006), and Coakley et al. (2007) for the UK; Cai and Wei (1997) and Kutsuna et al. (2002) for Japan; Kim et al. (2004) for Thailand; Wang (2005) for China; Pagano et al. (1998) and Bonardo et al. (2007) for Italy; and Álvarez and Gonzalez (2005) for Spain. Long-run underperformance is usually explained by many hypotheses, the main ones being: the agency theory (Jensen and Meckling, 1976), the window-dressing hypothesis (Teoh et al., 1998), and the windows of opportunity hypothesis (Ritter, 1991; Loughran and Ritter, 1995). In this paper we test if the long-run operating underperformance

is explained by the change in ownership. Following the agency theory (Jensen and Meckling, 1976), one of the reasons for operating performance decline advanced in literature is the ownership dilution subsequent to IPO. Jain and Kini (1994) are the first to test and confirm this hypothesis on a sample of US IPOs, but, in a successive paper, Mikkelson et al. (1997) couldn't relate the deterioration in operating performance to the ownership structure in the US. Some studies conducted outside the US find partial support for the ownership change hypothesis (Kutsuna et al., 2002; Kim et al., 2004; Wang, 2005; Bonardo et al., 2007), while other reasons are also verified (Cai and Wei, 1997; Kurshed et al., 2003; Álvarez and Gonzalez, 2005; Coakley et al., 2007).

Another important issue is whether the presence of a private equity firm is positively related to firms' operating performance after the IPO. Literature shows that their capacity of selecting and screening promising and high-growth firms, their contacts with top-tier managers to enhance the governance of the firm and with top-tier bankers to ease access to capital and attract high-quality research analysts to follow their firms and reduce information asymmetries have a positive impact on post-issue performance (Jain and Kini, 1995; Brav and Gompers, 1997; Jain, 2001; Kutsuna et al., 2002; Tykvovà and Walz, 2007; Soufani et al., 2008; Katz, 2009; Krishnan et al., 2011; Levis, 2011).

The aim of this research is to verify if the decline in operating performance in the Italian market is related to ownership dilution post-IPO. In addition, we question if operating performance is also related to the presence of private equity firms among firms' shareholders. The analysis is conducted on a sample of Italian firms listed on the Italian stock Exchange over the period 2003-2009 and tests the effect of ownership both before and after IPO. In details, we test if: (i) the stake held by top 3 shareholders before IPO; (ii) its change following IPO; (iii) the presence of private equity firm before IPO; and (iv) the presence of private equity firm after IPO positively affect firms' operating performance. Operating performance is represented by three indexes that have received much attention in the literature: EBITDA margin, ROA and sales growth (Cai and Wei, 1997; Kutsuna et al., 2002; Meles et al., 2014).

A distinctive feature of this paper is the choice to perform two different analyses, one over the years before the listing and another one over the change reported due to the listing. It is interesting to note that a theory, which holds under certain conditions, report different results when these conditions change. In addition, most of the Italian firms are family-owned and IPOs represent the first time they can incur in agency costs (Gangi, 2008). The findings of this paper are twofold: the analysis conducted before the IPO finds support for the agency theory

and the ownership hypothesis, while it does not hold in the post-IPO analysis, although it should be noted that, descriptively, the hypothesized relationships have been confirmed. The hypotheses that ownership concentration and structure (private equity presence) influence operating performance is verified for the years before the IPO, but it cannot be generalized for the years subsequent the listing. This is an interesting finding of the paper, which should need further investigation.

The remainder of the paper is organized as follows: Section 2 presents literature about the ownership change hypothesis. Section 3 describes data, sample construction procedures, variable definitions and the methodological approach. Section 4 reports the results, Section 5 describes the main results and Section 6 concludes the paper.

2. AGENCY THEORY AND OPERATING PERFORMANCE

Worldwide empirical evidence shows that usually firms undergoing IPOs report a subsequent significant decline in operating performance (Jain and Kini, 1994, and Mikkelson et al., 1997 for the USA; Kurshed et al., 2003, Murray et al., 2006 and Coakley et al., 2007 for the UK; Cai and Wei, 1997 and Kutsuna et al., 2002 for Japan; Kim et al., 2004 for Thailand; Wang, 2005 for China; Pagano et al., 1998 and Bonardo et al., 2007 for Italy; Álvarez and Gonzalez, 2005 for Spain). What happens is that market investors have high expectations about the firm's future performance, which are not verified. This phenomenon is usually explained by many hypotheses, the main ones being: the agency theory (Jensen and Meckling, 1976), the window-dressing hypothesis (Teoh et al., 1998), and the windows of opportunity hypothesis (Ritter, 1991; Loughran and Ritter, 1995). In this paper we test if the long-run operating underperformance experienced by Italian newly public firms is explained by the agency theory.

The relationship between stockholders and managers of a firm is a pure agency relationship, where the stockholders (the principals) hire the managers (the agents) to act in their own behalf. Obviously the two parties have different goals and interests and this requires that principals must establish appropriate incentives, both monetary and non-monetary, and will bear some costs in order to align and monitor agents. By doing so, the principal will induce agent's behavior so that it will maximize the principal's welfare.

The decision of a firm to go public brings some issues associated with the separation of ownership and control, which is closely related to the principal-agent problem and the agency theory. During an IPO, owners and managers usually sell (some of) their shares to the public,

in order to monetize (part of) their investment. This brings to an ownership dilution and the entrance of outside, small shareholders in the firm. While, before the IPO, the firm is owned and controlled by few shareholders, who have big incentives in monitoring managers and managing the firm properly, the entrance of new minority shareholders in the firm after the IPO reduces pre-existing shareholders' incentives to monitor. This misalignment of interests increases managers' incentives in appropriating part of the firm resources for their own consumptions, in the form of perquisites and reduces managers' incentives to devote significant effort in new, risky and time-consuming activities. The sell of shares reduces incentives for managers and owners (Jensen and Meckling, 1976).

Studies conducted on US public firms in the past support this hypothesis. Mikkelson and Partch (1985) find that public firms' performance decreases in periods of top management turnover and decrease of ownership concentration. Wruck (1989) finds that an increase in ownership concentration is associated with an increase in firm value and Morck et al. (1988) find evidence that low ownership and low market valuation of the firm are related.

A number of US studies started analyzing the operating performance of a special type of IPO firms, reverse leveraged buyouts (LBOs) (Muscarella and Vetsuypens, 1990; Degeorge and Zeckhauser, 1993). However, it must be noted that reverse LBOs are not representative of firms going public, since these are firms which go from public to private (less information asymmetry), are larger and more indebted (Degeorge and Zeckhauser, 1993).

Jain and Kini (1994) are the first to study IPO firms that are not reverse LBOs and find that operating performance is affected by ownership changes. Evidence shows that post-IPO operating performance declines after IPO, and this decline is smaller for firms where entrepreneurs retain more equity. On the opposite, Mikkelson et al. (1997) document that firms' operating performance declines in the years surrounding the IPO and in the first ten years of public trading, but this deterioration is unrelated to the changes in stock ownership. In addition, they find that operating performance is negatively correlated to the sale of shares by existing shareholders, probably reflecting a favorable performance of the firm more than the change in ownership, since operating performance is higher in the first year of public trading and declines in the following years.

Other studies focus on post-IPO stock price underperformance, supporting the evidence that investors are continuously surprised by the post-IPO declines (Ritter, 1991; Loughran and Ritter, 1995). Poor post-issue operating performance has been documented also for seasoned equity offerings (McLaughlin et al., 1996; Loughran and Ritter, 1997).

International evidence confirms post-issue declines, but reasons are not univocal.

Evidence on the Japanese market is not conclusive. While Cai and Wei (1997) find that the decline of long-run stock returns and operating performance of firms listed on the Tokyo Stock Exchange cannot be attributed to the change in ownership and find support for the windows of opportunity hypothesis, Kutsuna et al. (2002) show that, for JASDAQ[11] firms, post-IPO deterioration is partly attributable to the reduced managerial ownership.

In the UK, Kurshed et al. (2003) find that firms going public on the Official List of the London Stock Exchange show a substantial decline in their post-issue operating performance. On the contrary, the decline does not happen to firms going public on the Alternative Investment Market (AIM). Firms going public on the AIM are smaller, younger and less profitable than their counterparts on the Official List. The authors explain that while firms listing on the AIM see this event as a way to grow and raise funds without sacrificing their profitability, firms using the Official List use their listing as a way to reduce their leverage and rebalance their capital structure. Coakley et al. (2007) find that post-issue operating performance of UK firms declines five years post-IPO. A deeper analysis reveals that the decline is only driven by the dramatic underperformance during the 1998-2000 bubble years, rejecting the change of ownership hypothesis (Jain and Kini, 1994) and supporting the market timing theory and the window of opportunity theory (Loughran and Ritter, 1995; Ljungqvist et al., 2006).

An analysis of the Spanish market shows that the decline in operating performance may be due to windows of opportunity and window dressing rather than the change in ownership structure (Álvarez and Gonzalez, 2005).

A look at an emerging market, Thailand, suggests the presence of a curvilinear relationship between managerial ownership and post-IPO operating performance. A positive relationship between ownership and operating performance exists only for firms with low and high levels of managerial ownership, while the intermediate level shows a negative pattern, suggesting that both the agency theory and the entrenchment[12] hypothesis co-exist (Kim et al., 2004). The same result is shown by Bonardo et al. (2007) on the Italian market. The authors study the impact of a change in ownership structure, identifying two different kind of shareholders: substantial shareholders, identified as shareholders entitled of at least 3% of the firm's equity, and managerial ownership, represented by the percentage of equity owned by the firm's

11 JASDAQ is the acronym of Japan Association Of Securities Dealers Automated Quotation, an over-the-counter system for security trading created in 1963 by the Japan Securities Dealer Association. In 2004, it changed its name to the Jasdaq Securities Exchange, and was formally recognized as a securities exchange.

12 Managers indulging in non-value maximizing behavior.

directors. Then, they split the 2 groups in 2 subsamples: high-retention vs. low-retention shareholders and find that there is a non-linear relationship between ownership structure and operating performance, represented by ROA, ROE and cash flow return on assets (CFROA). In China, Wang (2005) finds that exist a curvilinear relation between legal-entity ownership and performance changes and between non-state ownership[13] and performance changes. Their findings partially support the agency theory, which co-exist with management entrenchment, and large shareholders' expropriation[14] in the Chinese market.

International evidence on post-IPO stock price performance confirms the post-issue decline, although some countries show an opposite pattern (Aggarwal et al., 1993; Leleux, 1993; Loughran et al., 1994; Kim et al., 1995; Arosio et al., 2001; Fabrizio and Samà, 2001).

In this paper we examine the effect of ownership on operating performance on a sample of Italian firms listed on the Italian stock Exchange over the period 2003-2009. Two major dimensions of ownership are taken into consideration: ownership concentration and owner type. The first dimension provides quantitative information on ownership and is proxied by top 3 shareholders at the time of IPO. In the analysis we also used top 1 shareholder at the time of IPO as a proxy but we had to exclude it due to strong collinearity problems with the top 3 shareholders' proxy. Interestingly, the sample analyzed shows the absence of a non-linear relationship as stated by Bonardo et al. (2007), as can be seen in Figures 1, 2, and 3.

Figure 1: Partial Regression Line between "Change_TOP_3" and Change_EBITDA_Margin"

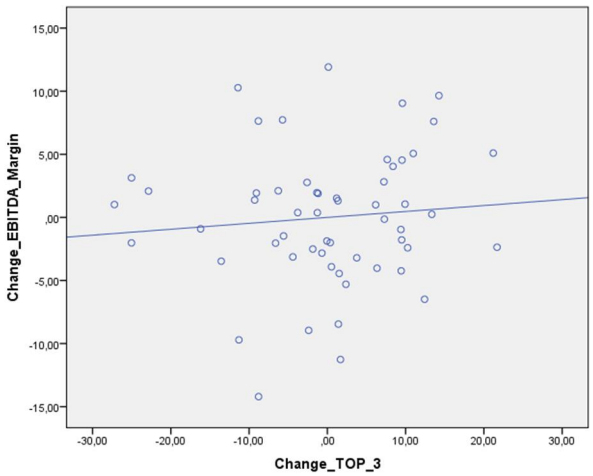
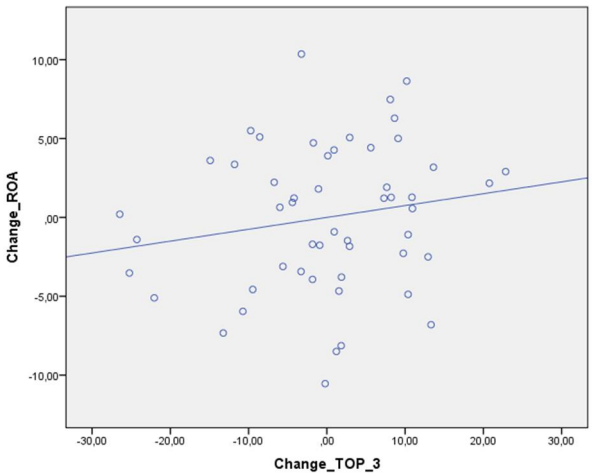


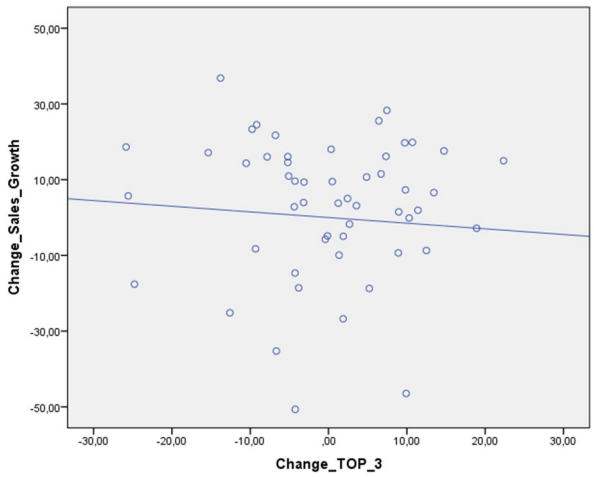
Figure 2: Partial Regression between "Change_TOP_3" and "Change_ROA"



13 In China, the majority of private firms are state-owned. Before going public, firms have to be restructured into stock companies and their shares are sold to employees, other state-owned firms and legal entities. At IPO, a restructured firm usually sells about 1/3 of its shares to the public, while the other 2/3 are split into state and legal-entity shares (Wang, 2005).

14 Large, controlling shareholders have all the opportunities and incentives to extract value from small, non-controlling shareholders.

Figure 3: Partial Regression Line between "Change_TOP_3" and "Change_Sales_Growth"



A distinctive feature of this paper is the choice to perform two different analyses, one over the years before the listing and another one over the change reported due to the listing. It is interesting to note that a theory, which holds under certain conditions, report different results when these conditions change or vice versa.

We distinguish two different periods: the pre-IPO years, from three years before IPO to the year before IPO (Year -3, -2, and -1), and the post-IPO years, from the year of IPO to three years after IPO (Year 0, +1, +2, and +3). We perform 2 econometric analyses, the first one over the years before IPO and the second one comparing the changes recorded in the two periods, the pre- and post-IPO years.

Hence, the hypotheses for the first ownership dimension are the following:

Hypothesis 1: Pre-IPO performance is affected by ownership concentration

a. *Pre-IPO EBITDA margin is expected to be positively related to the percentage held by top 3 shareholders;*
b. *Pre-IPO ROA is expected to be positively related to the percentage held by top 3 shareholders;*
c. *Pre-IPO SALES growth is expected to be positively related to the percentage held by top 3 shareholders.*

Hypothesis 2: Changes in operating performance after IPO are affected by changes in ownership concentration

a. *The change of EBITDA margin after IPO is expected to be positively related to the change of stake held by top 3 shareholders;*
b. *The change of ROA after IPO is expected to be positively related to the change of stake held by top 3 shareholders;*
c. *The change of SALES growth after IPO is expected to be positively related to the change of stake held by top 3 shareholders.*

The second dimension of ownership which we take into consideration refers to the certification and value-added functions of venture capital backing on post-IPO operating performance. This dimension provides qualitative information about the type of shareholder.

A large body of literature shows that affiliation with venture capitalists in the IPO process (Barry et al., 1990; Megginson and Weiss, 1991; Lin and Smith, 1998; Wang et al., 2003; Sanders and Boivie, 2004; Pollock et al., 2010) positively influences firm value. One of the first studies to analyze the importance of venture capital certification role is that of Barry et al. (1990). Studying a comprehensive set of US venture capital (VC) backed IPOs between 1978 and 1987, the authors find that outside investors recognize venture capitalists' important monitoring and control role. Hellmann and Puri (2002) show that venture capitalists play a more managerial role compared to other traditional financial intermediaries and they are crucial in making newly public firms more professional organizations. On the basis of 2 surveys conducted in Canada to investigate the role of venture capitalists, Amit et al. (1998) support the certification role and conclude that venture capitalists exist due to their ability to reduce market failures such as informational asymmetries and moral hazard. Sanders and Boivie (2004) investigate the role played by corporate governance characteristics as indirect indicators to lower the risk associated with information asymmetry and uncertainty in the valuation of new firms in emerging sectors and find out that venture capital participation is positively associated with market valuations. Studies that have extended the analysis to the venture capitalists' certification role in other markets and periods show mixed results. In particular, previous studies on bank-oriented systems have found weak or no evidence to support the certification theory, especially in Europe (Hamao et al., 2000; Schertler, 2001; Franzke, 2004; Chanine et al., 2007; Klaassen and von Eije, 2009).

Looking at the impact on post-IPO operating performance, Jain and Kini (1995) argue that the certification role fulfilled by venture capital firms reduces agency costs and conflicts of interests between principals and agents in the US market. The authors are the first to analyze the impact of venture capital presence on post-IPO operating performance and find that VC-backed IPOs show superior operating performance compared to non-VC backed IPOs.

Although Kutsuna et al. (2002) find that VC backing results in relatively superior operating performance in Japan, international evidence is not supportive (Wang et al., 2003; Murray et al., 2006; Coakley et al., 2007; Meles, 2011).

Studying a sample of 92 VC-backed companies listed on the Singapore stock exchange from 1987 to 2001, Wang et al. (2003) find support for the opposite, the operating performance of private equity (PE) backed newly public firms is inferior than non-PE backed newly public firms, while in the UK Murray et al. (2006) and Coakley et al. (2007) find that the post-issue operating performance of VC and non-VC backed buyouts and IPOs is never significant. In

Italy, Meles (2011) compares post-issue median profitability measures of PE-backed and non-PE backed IPOs and finds no difference between the two groups.

Researches on VC impact on market performance report mixed results as well. In the US, Brav and Gompers (1997) find that, in the long run, VC-backed IPOs show superior market performance compared non-VC backed IPOs, and Katz (2009) shows that PE-backed firms with majority ownership by PE sponsors exhibit superior long-run stock price performance after the issue, while Doukas and Gonenc (2005) find no impact of venture capital on long-run performance. In UK and Canada Soufani et al. (2008) and in Germany Tykvovà and Walz (2007) report evidence similar to those of Brav and Gompers (1997). On the opposite, Hamao et al. (2000) in Japan, da Silva Rosa et al. (2003) in Australia, Jelic et al. (2005), Coakley et al. (2008) and Belghitar and Dixon (2012) in the UK and Bessler and Kurth (2007) in Germany find no support for a certification role by venture capitalists in the long-run stock market performance.

A European study on operating and market performance conducted by Rindermann (2005) in France, Germany and the UK shows that VC-backed firms do not generally outperform those without venture backing. However, a detailed analysis evidences that a subgroup of internationally operating venture capitalists has positive effects on both operating and market performance of portfolio firms, highlighting the heterogeneity among venture capitalists in the European market.

Distinguishing three groups of IPO firms, namely PE-backed, VC-backed and other firms, in the UK market, Levis (2011) provides evidence that PE-backed IPOs achieve better operating and market performance in the three years post-issue. Bergstrom et al. (2006) perform an analysis of PE-backed firms in the French and UK market and find that PE-backed firms outperform other IPOs, although all firms report long-run stock price underperformance.

In Italy, Cenni et al. (2001) show that PE-backed firms show better long-run market performance after IPO while Viviani et al. (2008) find the opposite. Rossi (2012) finds no difference between the 2 groups.

With an analysis on private equity firms' exit in Italy, Meles et al. (2014) find that only VC-backed firms outperform other PE-backed firms after the private equity firm exit, and that PE-backed firms that go public perform worse that firms where private equity firms exit through other ways, such as trade sale, secondary buy-out and buy-back.

In the analysis we take into account the presence of a private equity firm both before and after IPO and conduct an econometric analysis to assess if the presence of PE firms after going

public reduces the problem of control and positively affects post-IPO operating performance. The hypotheses for pre-IPO years are the following:

Hypothesis 3: Pre-IPO performance is affected by owner type

a. *Pre-IPO EBITDA margin is expected to be positively related to the presence of private equity firms;*
b. *Pre-IPO ROA is expected to be positively related to the presence of private equity firms;*
c. *Pre-IPO SALES growth is expected to be positively related to the presence of private equity firms.*

The hypotheses for the change in operating performance are the following:

Hypothesis 4: Changes in operating performance after IPO are affected by owner type

a. *The change of EBITDA margin is expected to be positively related to the presence of private equity firms after IPO;*
b. *The change of ROA is expected to be positively related to the presence of private equity firms after IPO;*
c. *The change of SALES growth is expected to be positively related to the presence of private equity firms after IPO.*

The analysis of the Italian market is interesting for several reasons. First, most of the Italian firms are family-owned and are characterized by an absence of separation between ownership and control at the time of the offering. For the majority of Italian newly public firms this is the first time they can incur in agency costs. Gangi (2008) finds that IPOs bring major changes in the top management and a significantly greater separation of ownership and control. Second, it adds evidence to the literature relative to the European contest, on one side, and to bank-oriented systems, on the other side.

The analysis is conducted over three operating performances that have received much attention in the literature: EBITDA margin, ROA and sales growth (Cai and Wei, 1997; Kutsuna et al., 2002; Meles et al., 2014). The first ratio is equal to earnings before interest, tax, depreciation and amortization (EBITDA) divided by net sales. We prefer to calculate ROA as operating income (EBIT) over total assets, instead of net income to total assets, because it is a cleaner measure of the productivity of operating assets than net income (Barber and Lyon, 1996). Finally, we also evaluate the annually growth rate of net sales.

3. DATA AND METHOD

3.1.Sample and data sources

The investigation is focused on the Italian market. We manually compiled a database of all IPOs on the Italian Stock Exchange over the period 2003-2009. The examination period has been chosen in order to isolate the "bubble" years (1999-2000) and its subsequent effects (2001-2002), and to have accounting data for the EBITDA margin, ROA and sales growth for the 3 years following IPO. To select the sample, we excluded IPOs filed by financial institutions, by companies that were already listed on other foreign stock exchanges and by firms with incomplete information about the offer and the aftermarket. The sample is made of 58 IPOs, out of which 26 were PE-backed at the time of IPO.

Data have been collected from several sources:

- data on the issuing characteristics from offerings prospectuses;
- data on IPOs from the Italian Stock Exchange website (http://www.borsaitaliana.it);
- accounting data pre-IPO from offering prospectuses;
- accounting data post-IPO from publicly available financial statements downloaded from firms' websites.

To identify PE-backed IPOs, we have been using the records of the Italian Private Equity and Venture Capital Association (www.aifi.it).

The software used for the statistical analysis is IBM SPSS Statistics.

3.2.EBITDA Margin, ROA and Sales Growth

3.2.1. Pre-IPO analysis

3.2.1.1. EBITDA margin (EBITDA_Margin_Pre_IPO)

We calculate the EBITDA margin for the 3 years before IPO (Year -3, -2, and -1) using the formula: (Earnings Before Interest, Taxes, Depreciation and Amortization)/(Net Sales) and take the average value.

3.2.1.2. ROA (ROA_Pre_IPO)

The average value of ROA for the 3 years before IPO (Year -3, -2, and -1) has been calculated using the formula: (Earnings Before Interest and Taxes)/(Total Assets). EBIT is a cleaner measure of the productivity of operating assets than net income (Barber and Lyon, 1996), which is an alternative way to compute ROA.

3.2.1.3. Sales growth (Sales_Growth_Pre_IPO)

Sales growth is calculated as the annual growth rate of net sales: (((Net Sales$_t$)-(Net Sales$_{t-1}$))/(Net Sales$_{t-1}$))*100%.

Since this index compares two years, we only take the average value for the 2 years before IPO (Year -2, and -1).

3.2.2. Change analysis (post-IPO operating performance – pre-IPO operating performance)

3.2.2.1. EBITDA margin (Change_EBITDA_Margin)

This ratio is the difference between the average EBITDA margin calculated from the year of IPO to three years after IPO (Year 0, +1, +2, and +3) and the average EBITDA margin for the 3 years before IPO (Year -3, -2, and -1).

3.2.2.2. ROA (Change_ROA)

The average value of ROA calculated from the year of IPO to three years after IPO (Year 0, +1, +2, and +3) minus the average ROA for the 3 years before IPO (Year -3, -2, and -1).

3.2.2.3. Sales growth (Change_Sales_Growth)

The difference between the average value of sales growth from the year of IPO to three years after IPO (Year 0, +1, +2, and +3) minus the average value of sales growth for the 2 years before IPO (Year -2, and -1).

3.3.Ownership and Private Equity Backing

3.3.1. Pre-IPO analysis

3.3.1.1. Top 3 shareholders (TOP_3_Pre_IPO)

The independent variable TOP_3_Pre_IPO is represented by the shareholdings held by firm's top 3 shareholders at the time of IPO as reported on the offering prospectus.

3.3.1.2. Private Equity backing (PE_Pre_IPO)

A dummy variable that equals one if the firm is backed by a private equity firm at the time of the offering, zero otherwise.

3.3.2. Change analysis

3.3.2.1. Top 3 shareholders (Change_TOP_3)

The difference between the shareholdings held by firm's top 3 shareholders after IPO minus the shareholdings held by firm's top 3 shareholders at the time of IPO.

3.3.2.2. Private Equity backing (PE_Post_IPO)

A dummy variable that equals one if the firm is backed by a private equity firm after the IPO, zero otherwise.

3.4.Control variables

3.4.1. Age (LN_Age)

We use the logarithm of the age of the firm at IPO (Ln (1+age)). Age is defined as the calendar year of offering minus the calendar year of founding. Thus, a 2-year old firm may be anywhere from 13 months old to 35 months old. We expect that age has a negative impact on operating performance, since older firms have probably reached their maturity level.

3.4.2. Employees (LN_EMP)

We use the logarithm of the number of employees at the time of IPO. We expect that the number of employees negatively influences the post-IPO operating performance (Kutsuna et al., 2002). We use employees as a proxy of size, since the variable size presented strong collinearity problems with age.

3.4.3. Debt ratio (Debt_Ratio)

Debt_Ratio is calculated as the ratio of total bank debt to total assets. Both numbers are taken at the last date available before the IPO. We take the debt ratio in order to capture the firm's financial structure (Meles et al., 2014).

3.4.4. Secondary Shares Offered (Sec_Share)

The ratio of the number of secondary shares offered by the number of shares offered. This ratio represents the existing shares sold by pre-IPO shareholders during the offer and it might be indicative of the fact that current shareholders are selling shares to follow favorable performance and to precede a decline in future performance (Mikkelson et al., 1997).

3.5.Model

The model used is the Ordinary Least Squares, which is the most robust, from a mathematical point of view. In addition, the graphical representation of data does not suggest a relationship different from a linear one.

We divided the period of analysis in two periods: the pre-IPO years, from three years before IPO to the year before IPO (Year -3, -2, and -1), and the post-IPO years, from the year of IPO to three years after IPO (Year 0, +1, +2, and +3). Then, we perform econometric analyses over (i)

the pre-IPO years and (ii) the changes recorded in the two periods, the pre- and post-IPO years.

The OLS regression model takes the following general mathematical formulation:

$$Y_{EBITDA\_Margin\_Pre\_IPO} = a + b_1 X_{TOP\_3\_Pre\_IPO} + b_2 X_{PE\_Pre\_IPO} + b_3 X_{LN\_Age} + b_4 X_{LN\_EMP} + b_5 X_{Debt\_Ratio},$$

$$Y_{ROA\_Pre\_IPO} = a + b_1 X_{TOP\_3\_Pre\_IPO} + b_2 X_{PE\_Pre\_IPO} + b_3 X_{LN\_Age} + b_4 X_{LN\_EMP} + b_5 X_{Debt\_Ratio},$$

and

$$Y_{Sales\_Growth\_Pre\_IPO} = a + b_1 X_{TOP\_3\_Pre\_IPO} + b_2 X_{PE\_Pre\_IPO} + b_3 X_{LN\_Age} + b_4 X_{LN\_EMP} + b_5 X_{Debt\_Ratio}$$

for the first group;

$$Y_{Change\_EBITDA\_Margin} = a + b_1 X_{Change\_TOP\_3} + b_2 X_{PE\_Post\_IPO} + b_3 X_{LN\_Age} + b_4 X_{Debt\_Ratio} + b_5 X_{Sec\_Share} + b_6 X_{LN\_EMP},$$

$$Y_{Change\_ROA} = a + b_1 X_{Change\_TOP\_3} + b_2 X_{PE\_Post\_IPO} + b_3 X_{LN\_Age} + b_4 X_{Debt\_Ratio} + b_5 X_{Sec\_Share} + b_6 X_{LN\_EMP},$$

and

$$Y_{Change\_Sales\_Growth} = a + b_1 X_{Change\_TOP\_3} + b_2 X_{PE\_Post\_IPO} + b_3 X_{LN\_Age} + b_4 X_{Debt\_Ratio} + b_5 X_{Sec\_Share} + b_6 X_{LN\_EMP}$$

for the second group, where bi (i= 1, 2, 3, 4, 5, 6) indicates the regression coefficient.

4. RESULTS

Descriptive statistics are reported in Table 38. EBITDA_Margin_Pre_IPO shows an average value of 9.30%, although the dispersion from the average, expressed by the standard deviation, is very high, meaning that average is not a particularly relevant central tendency. After the IPO, the EBITDA margin reduces of about 6.41%. The average ROA_Pre_IPO is 8.61% and it changes, after IPO, of around -1.79%. Sales_Growth_Pre_IPO presents a high average value of 78%, meaning that, on average, Italian issuers record high performances and high growth in net sales right before going public. A different trend is recorded after IPO, where it reduces of around 64%, with a very high dispersion. Firms are closely held by top shareholders both before and after the IPO. Top 1 shareholders hold 67% stakes on average before IPO, which drops to 46% after the IPO, with a change of -22% on average. Top 3 shareholders hold about 88% of the firm before IPO and 58% after IPO, with a reduction of about 30% on average. It is not easy to interpret the average value of LN_Age. Referring to the data originally used for the calculation of this variable, it can be noted that the average time for a firm to go public is relatively long (19 years), with a high standard deviation of 13.5 years. Only 25% of the companies go public within 2 years after the incorporation, while 50%

of the companies employ up to 16.5 years, and 75% of the companies up to 29 years (the remaining 25% takes more than 29 years to go public). Similar difficulties of interpretation concern the variable LN_EMP. Using the data source, it can be noted that, at the time of IPO, firms have a high number of employees, 1,260 units on average, although with high variability, since the value ranges from a minimum of 16 to a maximum of 12,143 employees. 25% of companies had up to 169 employees, 50% of companies up to 519 employees and 75% of companies up to 1326 employees (the remaining 25% employed more than 1326 workers).

The Debt_Ratio stands at an average of about 24% and the sample is dominated by companies with low levels of debt.

Finally, the percentage of shares sold in the offer by existing shareholders (Sec_Share) is about 43%.

Table 38: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Ebitda_Margin_Pre_IPO	58	-515,64	68,03	9,3070	71,42256	-7,186	,314	53,736	,618
ROA_Pre_IPO	58	-48,39	45,75	8,6107	11,18951	-1,356	,314	13,372	,618
Sales_Growth_Pre_IPO	58	,11	2869,23	78,0273	374,34925	7,528	,314	57,080	,618
Change_EBITDA_Margin	58	-221,31	11,24	-6,4101	30,78795	-6,339	,314	43,537	,618
Change_ROA	58	-25,28	16,63	-1,7896	7,45845	-,181	,314	1,692	,618
Change_Sales_Growth	58	-2850,52	33,01	-63,8711	373,54363	-7,540	,314	57,206	,618
TOP_3_Pre_IPO	58	21,24	100,00	87,7724	17,38978	-1,657	,314	2,745	,618
LN_Age	58	,69	4,30	2,6590	,80534	-,479	,314	-,286	,618
LN_EMP	58	2,77	9,40	6,2034	1,47334	-,183	,314	-,279	,618
Debt_Ratio	58	,00	55,42	24,4559	14,52549	,231	,314	-,631	,618
Change_Top_3	58	-60,00	-3,63	-30,0034	12,16446	-,023	,314	,452	,618
Sec_Share	58	,00	100,00	42,8966	39,45490	,303	,314	-1,564	,618
Valid N (listwise)	58								

Before IPO, 26 companies out of 58 (44.83%) were PE-backed. Only 2 private equity firms completely exited the investment at IPO, reducing the number of PE-backed firms post-IPO to 24 (42.86%).

4.1. Pre-IPO analysis

4.1.1. Pre-IPO analysis and EBITDA_Margin_Pre_IPO

Statistical units with anomalous values of EBITDA_Margin_Pre_IPO were excluded, resulting in a sample of 55 firms.

Table 39 presents the correlation matrix between the independent variables and the dependent variable. As can be inferred, there are no significant correlations among the data.

Table 39: Correlation matrix with the dependent variable EBITDA_Margin_Pre_IPO

		Ebitda_Margin_Pre_IPO	TOP_3_Pre_IPO	PE_Pre_IPO	LN_Age	LN_EMP	Debt_Ratio
Ebitda_Margin_Pre_IPO	Pearson Correlation	1	,134	-,018	-,193	-,126	,072
	Sig. (2-tailed)		,328	,899	,159	,359	,602
	N	55	55	55	55	55	55
TOP_3_Pre_IPO	Pearson Correlation	,134	1	-,393**	,034	,293*	,132
	Sig. (2-tailed)	,328		,003	,807	,030	,336
	N	55	55	55	55	55	55
PE_Pre_IPO	Pearson Correlation	-,018	-,393**	1	-,076	,055	,191
	Sig. (2-tailed)	,899	,003		,583	,689	,161
	N	55	55	55	55	55	55
LN_Age	Pearson Correlation	-,193	,034	-,076	1	-,066	-,299*
	Sig. (2-tailed)	,159	,807	,583		,633	,027
	N	55	55	55	55	55	55
LN_EMP	Pearson Correlation	-,126	,293*	,055	-,066	1	,181
	Sig. (2-tailed)	,359	,030	,689	,633		,185
	N	55	55	55	55	55	55
Debt_Ratio	Pearson Correlation	,072	,132	,191	-,299*	,181	1
	Sig. (2-tailed)	,602	,336	,161	,027	,185	
	N	55	55	55	55	55	55

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Tables 40 and 41 present a summary of the model and the resulting analysis of variance (ANOVA) required for the verification of the significance of the coefficient of determination R^2.

Table 40: Model Summary with the dependent variable EBITDA_Margin_Pre_IPO

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,311[a]	,097	,005	10,23436	1,901

a. Predictors: (Constant), Debt_Ratio, TOP_3_Pre_IPO, LN_Age, LN_EMP, PE_Pre_IPO

Table 41: ANOVA with the dependent variable EBITDA_Margin_Pre_IPO

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	549,538	5	109,908	1,049	,400[b]
	Residual	5132,364	49	104,742		
	Total	5681,902	54			

b. Predictors: (Constant), Debt_Ratio, TOP_3_Pre_IPO, LN_Age, LN_EMP, PE_Pre_IPO

The adjusted R^2 is almost zero and not significant, meaning that the set of independent variables cannot explain the variability of the dependent variable EBITDA_Margin_Pre_IPO. The value of the Durbin-Watson index allows to state that there is no autocorrelation among the errors.

Table 42 presents the regression coefficients, the statistical significance testing, the 95% confidence intervals, and the collinearity indices, which confirm the absence of significant collinearity among the variables.

Table 42: Results from Ordinary Least Square Regression with the dependent variable EBITDA_Margin_Pre_IPO

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	21,000	10,346		2,030	,048	,209	41,791		
	TOP_3_Pre_IPO	,133	,093	,229	1,428	,160	-,054	,320	,716	1,397
	PE_Pre_IPO	1,380	3,170	,068	,435	,665	-4,990	7,750	,764	1,308
	LN_Age	-2,622	1,802	-,208	-1,455	,152	-6,243	,999	,904	1,106
	LN_EMP	-1,532	1,055	-,212	-1,453	,153	-3,652	,588	,869	1,151
	Debt_Ratio	,003	,107	,005	,033	,974	-,211	,218	,824	1,213

The regression model takes the following specific form:

$$Y_{EBITDA\_Margin\_Pre\_IPO} = 21.000 + 0.133\ X_{TOP\_3\_Pre\_IPO} + 1.380\ X_{PE\_Pre\_IPO} - 2.622\ X_{LN\_Age} - 1.532\ X_{LN\_EMP} + 0.003\ X_{Debt\_Ratio}$$

No regression coefficient is statistically significant.

The signs of the coefficients highlight the direct relationship between the dependent variable EBITDA_Margin_Pre_IPO and TOP_3_Pre_IPO. Descriptively, for the sample EBITDA_Margin_Pre_IPO is positively influenced by the stake held by the top 3 shareholders, as hypothesized by H1a. Negative relationships are reported for LN_Age and LN_EMP, meaning that older and bigger firms have lower profitability. The other variables PE_Pre_IPO and Debt_Ratio are independent on average, as shown by partial regression graphs not reported here.

The hypotheses behind the OLS model are verified. In particular, this method requires the verification of three hypotheses about the residuals:

1. The average of the residuals is zero, i.e. errors are distributed normally;
2. No correlation between the residuals and the independent variables;
3. Homogeneity of variance (the so-called hypothesis of "homoscedasticity").

From the analyses conducted separately, residuals distribution's is approximately normal, they distribute randomly (the points are distributed equally above and below the horizontal

axis, and there is no evidence of some systematic behavior), and the distance of the points from the horizontal axis does not seem to depend from the expected values of the dependent variable.

4.1.2. Pre-IPO analysis and ROA_Pre_IPO

After eliminating firms with an abnormal value of ROA_Pre_IPO, the sample is made of 52 firms. Table 43 presents the correlation matrix between the independent variables and the dependent variable, which does not show significant relationships. Although not significant, it can be noted, however, the positive linear correlation between the variables TOP_3_Pre_IPO and ROA_Pre_IPO, as expected.

Table 43: Correlation matrix with the dependent variable ROA_Pre_IPO

		ROA_Pre_IPO	TOP_3_Pre_IPO	PE_Pre_IPO	LN_Age	LN_EMP	Debt_Ratio
ROA_Pre_IPO	Pearson Correlation	1	,232	,062	-,064	-,129	-,131
	Sig. (2-tailed)		,098	,663	,650	,361	,354
	N	52	52	52	52	52	52
TOP_3_Pre_IPO	Pearson Correlation	,232	1	-,413**	-,001	,282*	,166
	Sig. (2-tailed)	,098		,002	,994	,043	,240
	N	52	52	52	52	52	52
PE_Pre_IPO	Pearson Correlation	,062	-,413**	1	,001	,073	,150
	Sig. (2-tailed)	,663	,002		,995	,608	,289
	N	52	52	52	52	52	52
LN_Age	Pearson Correlation	-,064	-,001	,001	1	-,150	-,234
	Sig. (2-tailed)	,650	,994	,995		,290	,096
	N	52	52	52	52	52	52
LN_EMP	Pearson Correlation	-,129	,282*	,073	-,150	1	,124
	Sig. (2-tailed)	,361	,043	,608	,290		,380
	N	52	52	52	52	52	52
Debt_Ratio	Pearson Correlation	-,131	,166	,150	-,234	,124	1
	Sig. (2-tailed)	,354	,240	,289	,096	,380	
	N	52	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The model summary and the analysis of variance (tables 44 and 45) show an adjusted R^2 of 0.131, significant at 5%, meaning that the set of independent variables explains the 13.1% of the variability of the dependent variable.. The Durbin-Watson index assumes a value of 1.830, confirming the absence of autocorrelation of the residuals.

Table 44: Model Summary with the dependent variable ROA_Pre_IPO

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,465[a]	,216	,131	3,98559	1,830

a. Predictors: (Constant), Debt_Ratio, LN_EMP, PE_Pre_IPO, LN_Age, TOP_3_Pre_IPO

Table 45: ANOVA with the dependent variable ROA_Pre_IPO

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	201,687	5	40,337	2,539	,041[b]
	Residual	730,708	46	15,885		
	Total	932,395	51			

b. Predictors: (Constant), Debt_Ratio, LN_EMP, PE_Pre_IPO, LN_Age, TOP_3_Pre_IPO

The regression model takes the following specific form:

$$Y_{ROA\_Pre\_IPO} = 6.194 + 0.117\, X_{TOP\_3\_Pre\_IPO} + 2.771\, X_{PE\_Pre\_IPO} - 0.902\, X_{LN\_Age} - 0.808\, X_{LN\_EMP} - 0.078\, X_{Debt\_Ratio}$$

Table 46: Results from Ordinary Least Square Regression with the dependent variable ROA_Pre_IPO

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	6,194	4,129		1,500	,140	-2,118	14,506		
	TOP_3_Pre_IPO	,117	,037	,490	3,108	,003	,041	,192	,684	1,461
	PE_Pre_IPO	2,771	1,293	,325	2,144	,037	,169	5,373	,741	1,349
	LN_Age	-,902	,729	-,169	-1,237	,222	-2,370	,566	,917	1,090
	LN_EMP	-,808	,402	-,284	-2,009	,050	-1,618	,001	,855	1,170
	Debt_Ratio	-,078	,041	-,265	-1,885	,066	-,162	,005	,860	1,162

Several regression coefficients are statistically significant.

First of all, there is a significant and direct relationship with the variable Top_3_Pre_IPO at 1% (p-value=0.003), meaning that, on average, an increase of 1% in the stake held by the three largest shareholders leads to an increase of ROA_Pre_IPO of 0.117%. Therefore, the hypothesis H1b is verified.

Another significant relationship is reported between ROA_Pre_IPO and PE_Pre_IPO, this time at 5% level (p-value=0.037). Hypothesis 3b is then confirmed: on average, the presence of private equity firms before IPO leads to a higher ROA of about 2.7%.

Significant is also the relationship between LN_EMP and ROA (10% significance level, p-value=0.050). As expected, there is an inverse relationship between the number of employees and the profitability pre-IPO. Obviously, the cost of labor (which is directly related to the number of employees) reduces the firm's profitability.

Also the variable Debt_Ratio shows a significant and inverse relationship with ROA, at 10% (p-value=0.066). On average, a 1% higher debt ratio results in a decrease of 0.078% in ROA_Pre_IPO.

Finally, the regression coefficient of the variable LN_Age is not statistically significant. Only descriptively it can be said that, again, there is a negative relationship between firm's age and firm's profitability.

In a separate analysis we verified that OLS residuals properties are respected.

4.1.3. Pre-IPO analysis and Sales_Growth_Pre_IPO

Two firms were excluded from the sample due to anomalous values of sales growth, resulting in a sample of 54 firms.

The matrix of correlations (table 47) reports only one significant and direct correlation, although of modest entity, between the variables Debt_Ratio and Sales_Growth_Pre_IPO.

Table 47: Correlation matrix with the dependent variable Sales_Growth_Pre_IPO

		Sales_Growth_Pre_IPO	TOP_3_Pre_IPO	PE_Pre_IPO	LN_Age	LN_EMP	Debt_Ratio
Sales_Growth_Pre_IPO	Pearson Correlation	1	-,055	,172	-,135	-,168	,272*
	Sig. (2-tailed)		,693	,213	,332	,224	,046
	N	54	54	54	54	54	54
TOP_3_Pre_IPO	Pearson Correlation	-,055	1	-,446**	,038	,315*	,152
	Sig. (2-tailed)	,693		,001	,785	,020	,273
	N	54	54	54	54	54	54
PE_Pre_IPO	Pearson Correlation	,172	-,446**	1	-,093	,110	,165
	Sig. (2-tailed)	,213	,001		,505	,427	,234
	N	54	54	54	54	54	54
LN_Age	Pearson Correlation	-,135	,038	-,093	1	-,053	-,302*
	Sig. (2-tailed)	,332	,785	,505		,705	,026
	N	54	54	54	54	54	54
LN_EMP	Pearson Correlation	-,168	,315*	,110	-,053	1	,199
	Sig. (2-tailed)	,224	,020	,427	,705		,150
	N	54	54	54	54	54	54
Debt_Ratio	Pearson Correlation	,272*	,152	,165	-,302*	,199	1
	Sig. (2-tailed)	,046	,273	,234	,026	,150	
	N	54	54	54	54	54	54

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The model summary and the analysis of variance (tables 48 and 49) show a low value of the adjusted R^2 of 0.065, which is not statistically significant. The Durbin-Watson index has a value of 2.198, showing an insignificant negative autocorrelation between the residuals.

Table 48: Model Summary with the dependent variable Sales_Growth_Pre_IPO

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,391[a]	,153	,065	19,30463	2,198

a. Predictors: (Constant), Debt_Ratio, TOP_3_Pre_IPO, LN_Age, LN_EMP, PE_Pre_IPO

Table 49: ANOVA with the dependent variable Sales_Growth_Pre_IPO

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3231,401	5	646,280	1,734	,145[b]
	Residual	17888,101	48	372,669		
	Total	21119,503	53			

b. Predictors: (Constant), Debt_Ratio, TOP_3_Pre_IPO, LN_Age, LN_EMP, PE_Pre_IPO

The regression model is the following:

$$Y_{Sales\_Growth\_Pre\_IPO} = 29.924 + 0.082\ X_{TOP\_3\_Pre\_IPO} + 7.350\ X_{PE\_Pre\_IPO} - 1.315\ X_{LN\_Age} - 3.707\ X_{LN\_EMP} + 0.361\ X_{Debt\_Ratio}$$

Table 50: Results from Ordinary Least Square Regression with the dependent variable Sales_Growth_Pre_IPO

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	29,924	19,549		1,531	,132	-9,382	69,229		
	TOP_3_Pre_IPO	,082	,187	,073	,441	,661	-,294	,458	,636	1,572
	PE_Pre_IPO	7,350	6,328	,185	1,161	,251	-5,374	20,074	,693	1,443
	LN_Age	-1,315	3,452	-,053	-,381	,705	-8,255	5,625	,901	1,110
	LN_EMP	-3,707	2,036	-,268	-1,820	,075	-7,801	,388	,815	1,226
	Debt_Ratio	,361	,198	,268	1,827	,074	-,036	,759	,822	1,217

None of the independent variables is significant. Descriptively, it can be noted that both present a positive relationship with the dependent variable, confirming the hypotheses H1c and H3c. Two control variables are significant: LN_EMP shows, again, a negative relationship, while Debt_Ratio a direct relationship, both at 10%. The number of employees negatively affects operating performance, while bank debt has a positive effect on sales growth.

Finally, the relationship between LN_Age and Sales_Growth_Pre_IPO is almost independent on average.

Through a separate analysis on the hypotheses behind the OLS model, we observe an approximately normal distribution of the residuals, but the regression model, while respecting the hypothesis that errors distribute randomly, does not meet the assumption of homoscedasticity, because the point cloud tends to widen, "reading" the graph from left to right. It has not been possible to overcome this problem using the most common transformations of the variables.

4.2. Change analysis

4.2.1. Change analysis and Change_EBITDA_margin

Two firms were excluded from the sample due to anomalous values of Change_EBITDA_Margin, resulting in a sample of 56 firms.

One more control variable has been added to the analysis: Sec_Share, the number of secondary shares offered by the existing shareholders at IPO.

The matrix of correlations (table 51) reports only one significant and direct correlation, at 5%, between the variables Sec_Share and Change_EBITDA_Margin.

Table 51: Correlation matrix with the dependent variable Change_EBITDA_Margin

		Change_EBITDA_Margin	Change_TOP_3	PE_Post_IPO	LN_Age	Debt_Ratio	Sec_Share	LN_EMP
Change_EBITDA_Margin	Pearson Correlation	1	-,032	,077	-,149	,141	,300*	-,079
	Sig. (2-tailed)		,818	,575	,273	,299	,025	,562
	N	56	56	56	56	56	56	56
Change_TOP_3	Pearson Correlation	-,032	1	,165	,128	-,127	-,345**	-,309*
	Sig. (2-tailed)	,818		,225	,349	,353	,009	,021
	N	56	56	56	56	56	56	56
PE_Post_IPO	Pearson Correlation	,077	,165	1	-,148	,236	-,070	,006
	Sig. (2-tailed)	,575	,225		,276	,080	,609	,966
	N	56	56	56	56	56	56	56
LN_Age	Pearson Correlation	-,149	,128	-,148	1	-,233	-,111	-,133
	Sig. (2-tailed)	,273	,349	,276		,084	,417	,329
	N	56	56	56	56	56	56	56
Debt_Ratio	Pearson Correlation	,141	-,127	,236	-,233	1	-,226	,138
	Sig. (2-tailed)	,299	,353	,080	,084		,094	,312
	N	56	56	56	56	56	56	56
Sec_Share	Pearson Correlation	,300*	-,345**	-,070	-,111	-,226	1	,430**
	Sig. (2-tailed)	,025	,009	,609	,417	,094		,001
	N	56	56	56	56	56	56	56
LN_EMP	Pearson Correlation	-,079	-,309*	,006	-,133	,138	,430**	1
	Sig. (2-tailed)	,562	,021	,966	,329	,312	,001	
	N	56	56	56	56	56	56	56

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The model summary and the analysis of variance (tables 52 and 53) show an adjusted R^2 of 0.145, which is statistically significant at 5% (p-value = 0.031). Therefore, the set of independent variables explains the 14.5% of the variability of the dependent variable. The Durbin-Watson index has a value of 2.290, indicating the absence of autocorrelation among the residuals.

Table 52: Model Summary with the dependent variable Change_EBITDA_Margin

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,488[a]	,238	,145	5,61118	2,290

a. Predictors: (Constant), LN_EMP, PE_Post_IPO, LN_Age, Debt_Ratio, Change_TOP_3, Sec_Share

Table 53: ANOVA with the dependent variable Change_EBITDA_Margin

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	482,962	6	80,494	2,557	,031[b]
	Residual	1542,782	49	31,485		
	Total	2025,744	55			

b. Predictors: (Constant), LN_EMP, PE_Post_IPO, LN_Age, Debt_Ratio, Change_TOP_3, Sec_Share

The regression model is the following:

$$Y_{Change\_EBITDA\_Margin} = 3.268 + 0.047\ X_{Change\_TOP\_3} + 0.232\ X_{PE\_Post\_IPO} - 0.557\ X_{LN\_Age} + 0.128\ X_{Debt\_Ratio} + 0.082\ X_{Sec\_Share} - 1.364\ X_{LN\_EMP}$$

Table 54: Results from Ordinary Least Square Regression with the dependent variable Change_EBITDA_Margin

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	3,268	4,943		,661	,512	-6,665	13,202		
	Change_TOP_3	,047	,070	,095	,675	,503	-,093	,187	,782	1,279
	PE_Post_IPO	,232	1,616	,019	,144	,886	-3,014	3,479	,890	1,124
	LN_Age	-,557	,993	-,074	-,561	,577	-2,552	1,439	,904	1,106
	Debt_Ratio	,128	,061	,299	2,087	,042	,005	,250	,759	1,317
	Sec_Share	,082	,024	,536	3,486	,001	,035	,130	,658	1,520
	LN_EMP	-1,364	,595	-,331	-2,290	,026	-2,560	-,167	,742	1,348

None of the independent variables is significant. Only descriptively, the sample shows a weak and direct relationship between Change_Top_3 and Change_EBITDA_Margin, supporting H2a, although it cannot be generalized. The other independent variable (PE_Post_IPO) is independent on average.

Three control variables are statistically significant at 5%:

- the variable Debt_Ratio (p-value = 0.042) reports a direct relationship with the dependent variable;
- Sec_Share (p-value = 0.001) also shows a direct relationship with the dependent variable;
- LN_EMP (p-value = 0.026) again presents a negative relationship with firms' profitability.

The same result is reported by the last control variable, LN_Age, which shows a negative relationship with profitability, as hypothesized, although it is not significant.

In a separate analysis we verified that OLS residuals properties are respected.

4.2.2. Change analysis and Change_ROA

Also in this model we excluded firms with anomalous values of Change_ROA, resulting in a sample of 52 firms.

The correlation matrix in table 55 shows no statistically significant correlations between the independent variables and the dependent variable.

Table 55: Correlation matrix with the dependent variable Change_ROA

		Change_ROA	Change_TOP_3	PE_Post_IPO	LN_Age	Debt_Ratio	Sec_Share	LN_EMP
Change_ROA	Pearson Correlation	1	,096	,167	-,233	-,076	,206	,054
	Sig. (2-tailed)		,499	,237	,096	,591	,142	,702
	N	52	52	52	52	52	52	52
Change_TOP_3	Pearson Correlation	,096	1	,205	,130	-,143	-,390**	-,351*
	Sig. (2-tailed)	,499		,144	,357	,311	,004	,011
	N	52	52	52	52	52	52	52
PE_Post_IPO	Pearson Correlation	,167	,205	1	-,090	,181	-,142	-,032
	Sig. (2-tailed)	,237	,144		,527	,200	,317	,823
	N	52	52	52	52	52	52	52
LN_Age	Pearson Correlation	-,233	,130	-,090	1	-,197	-,038	-,123
	Sig. (2-tailed)	,096	,357	,527		,162	,788	,386
	N	52	52	52	52	52	52	52
Debt_Ratio	Pearson Correlation	-,076	-,143	,181	-,197	1	-,208	,164
	Sig. (2-tailed)	,591	,311	,200	,162		,139	,247
	N	52	52	52	52	52	52	52
Sec_Share	Pearson Correlation	,206	-,390**	-,142	-,038	-,208	1	,486**
	Sig. (2-tailed)	,142	,004	,317	,788	,139		,000
	N	52	52	52	52	52	52	52
LN_EMP	Pearson Correlation	,054	-,351*	-,032	-,123	,164	,486**	1
	Sig. (2-tailed)	,702	,011	,823	,386	,247	,000	
	N	52	52	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The model summary and the analysis of variance (tables 56 and 57) show a non-significant (p-value = 0.198) very low adjusted R^2 (equal to 0.056). The Durbin-Watson index assumes the value of 1.637, showing a slight positive autocorrelation of the residuals, but not worrisome, given the size.

Table 56: Model Summary with the dependent variable Change_ROA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,409[a]	,167	,056	4,85401	1,637

a. Predictors: (Constant), LN_EMP, PE_Post_IPO, LN_Age, Debt_Ratio, Change_TOP_3, Sec_Share

Table 57: ANOVA with the dependent variable Change_ROA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	212,847	6	35,474	1,506	,198[b]
	Residual	1060,265	45	23,561		
	Total	1273,111	51			

b. Predictors: (Constant), LN_EMP, PE_Post_IPO, LN_Age, Debt_Ratio, Change_TOP_3, Sec_Share

The regression model is the following:

$$Y_{Change\_ROA} = 3.959 + 0.075\ X_{Change\_TOP\_3} + 1.582\ X_{PE\_Post\_IPO} - 1.579\ X_{LN\_Age} - 0.019\ X_{Debt\_Ratio} + 0.039\ X_{Sec\_Share} - 0.140\ X_{LN\_EMP}$$

Table 58: Results from Ordinary Least Square Regression with the dependent variable Change_ROA

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	3,959	4,375		,905	,370	-4,853	12,770		
	Change_TOP_3	,075	,062	,192	1,211	,232	-,050	,200	,739	1,352
	PE_Post_IPO	1,582	1,441	,157	1,097	,278	-1,321	4,485	,906	1,104
	LN_Age	-1,579	,889	-,249	-1,775	,083	-3,370	,213	,940	1,064
	Debt_Ratio	-,019	,051	-,056	-,365	,717	-,122	,085	,782	1,279
	Sec_Share	,039	,022	,303	1,737	,089	-,006	,084	,609	1,641
	LN_Emp	-,140	,549	-,042	-,254	,800	-1,245	,965	,676	1,478

None of the independent variables is significant, although they both show a positive relationship with Change_ROA. Thus, in our sample, the stake held by top 3 shareholders and the presence of a private equity firm after IPO positively influence ROA.

The variable LN_Age and Sec_Share present negative and positive significant relationships at 10%, respectively. Again, age negatively influences profitability, while the number of shares sold by existing shareholders improves it.

Debt_Ratio and LN_EMP present a negative and non-significant relationship with Change_ROA, although graphically the regression lines are almost horizontal.

As with the other models, OLS residuals properties have been verified and are respected.

4.2.3. Change analysis and Change_Sales_Growth

Excluding three anomalous cases of the dependent variable, the sample is made of 55 firms.

Table 59 presents the correlation matrix between the variables. As can be inferred, there are no significant correlations among the data.

Table 59: Correlation matrix with the dependent variable Change_Sales_Growth

		Change_Sales_Growth	Change_TOP_3	PE_Post_IPO	LN_Age	Debt_Ratio	Sec_Share	LN_EMP
Change_Sales_Growth	Pearson Correlation	1	,031	-,068	,061	-,161	-,150	-,136
	Sig. (2-tailed)		,821	,620	,656	,239	,275	,321
	N	55	55	55	55	55	55	55
Change_TOP_3	Pearson Correlation	,031	1	,236	,125	-,184	-,337*	-,377**
	Sig. (2-tailed)	,821		,082	,364	,179	,012	,005
	N	55	55	55	55	55	55	55
PE_Post_IPO	Pearson Correlation	-,068	,236	1	-,122	,194	-,125	,029
	Sig. (2-tailed)	,620	,082		,375	,155	,363	,834
	N	55	55	55	55	55	55	55
LN_Age	Pearson Correlation	,061	,125	-,122	1	-,276*	-,098	-,083
	Sig. (2-tailed)	,656	,364	,375		,042	,476	,544
	N	55	55	55	55	55	55	55
Debt_Ratio	Pearson Correlation	-,161	-,184	,194	-,276*	1	-,133	,172
	Sig. (2-tailed)	,239	,179	,155	,042		,333	,208
	N	55	55	55	55	55	55	55
Sec_Share	Pearson Correlation	-,150	-,337*	-,125	-,098	-,133	1	,443**
	Sig. (2-tailed)	,275	,012	,363	,476	,333		,001
	N	55	55	55	55	55	55	55
LN_EMP	Pearson Correlation	-,136	-,377**	,029	-,083	,172	,443**	1
	Sig. (2-tailed)	,321	,005	,834	,544	,208	,001	
	N	55	55	55	55	55	55	55

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Tables 60 and 61 present a summary of the model and the resulting analysis of variance (ANOVA) required for the verification of the significance of the coefficient of determination R^2.

Table 60: Model Summary with the dependent variable Change_Sales_Growth

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,253[a]	,064	-,053	25,25498	1,802

a. Predictors: (Constant), LN_EMP, PE_Post_IPO, LN_Age, Debt_Ratio, Change_TOP_3, Sec_Share

Table 61: ANOVA with the dependent variable Change_Sales_Growth

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2088,338	6	348,056	,546	,771[b]
	Residual	30615,082	48	637,814		
	Total	32703,421	54			

b. Predictors: (Constant), LN_EMP, PE_Post_IPO, LN_Age, Debt_Ratio, Change_TOP_3, Sec_Share

The adjusted R^2 is almost zero and non-significant, meaning that the set of independent variables cannot explain the variability of the dependent variable Change_Sales_Growth. The value of the Durbin-Watson index shows a slight and negligible positive autocorrelation among the errors.

Table 62: Results from Ordinary Least Square Regression with the dependent variable Change_Sales_Growth

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	3,002	21,471		,140	,889	-40,169	46,173		
	Change_TOP_3	-,149	,332	-,074	-,450	,655	-,816	,518	,727	1,376
	PE_Post_IPO	-1,835	7,426	-,037	-,247	,806	-16,766	13,096	,864	1,157
	LN_Age	-,211	4,465	-,007	-,047	,963	-9,188	8,767	,893	1,119
	Debt_Ratio	-,308	,263	-,185	-1,174	,246	-,836	,220	,787	1,271
	Sec_Share	-,115	,105	-,182	-1,089	,282	-,327	,097	,699	1,430
	LN_EMP	-,867	2,822	-,051	-,307	,760	-6,541	4,806	,702	1,425

Table 62 presents the regression coefficients, the statistical significance testing, the 95% confidence intervals, and the collinearity indices, which confirm the absence of significant collinearity among the variables.

The regression model takes the following specific form:

$$Y_{Change\_Sales\_Growth} = 3.002 - 0.149\ X_{Change\_TOP\_3} - 1.835\ X_{PE\_Post\_IPO} - 0.211\ X_{LN\_Age} - 0.308\ X_{Debt\_Ratio} - 0.115\ X_{Sec\_Share} - 0.867\ X_{LN\_EMP}$$

No regression coefficient is statistically significant and they all show a negative relationship with Change_Sales_Growth.

A separate analysis of the partial regression lines' graphs shows that the regression lines fail to approximate in an acceptable way the point cloud, and that, in the sample, there is a substantial independence on average between PE_Post_IPO and LN_Age and the dependent variable Change_Sales_Growth.

The analysis conducted to verify the hypotheses underlying the OLS model reports an anomaly in the distribution of the residuals, which shows some deviation from the normal distribution. The other 2 hypotheses are verified instead.

5. DISCUSSION

Evidence shows that firms going public report deterioration in operating performance. This phenomenon has been analyzed by academics worldwide, who have provided different theories and hypotheses. One of the most popular theses derives from the agency theory and refers to ownership dispersion. Through an IPO, firms usually issue new shares to sell to market investors and existing shareholders may also sell part or all of their shares. Following this event, new, outside shareholders enter the firm and ownership gets fragmented. This separation from ownership and control reduces managers' and founders' incentives to act in the interest of the firm and may bring to a reduction in profitability. International evidence, mainly represented by US studies, finds partial support for the change of ownership hypothesis (Mikkelson and Partch, 1985; Morck et al., 1988; Wruck, 1989; Muscarella and Vetsuypens, 1990; Degeorge and Zeckhauser, 1993; Jain and Kini, 1994; Kutsuna et al., 2002; Kim et al., 2004; Wang, 2005; Bonardo et al., 2007). In this paper we consider two ownership dimensions: a quantitative one represented by top 3 shareholders, and a qualitative one, on the type of shareholder, considers the presence of a private equity firm. The study is conducted on the Italian market and highlights many interesting results, which need to be carefully analyzed. The main hypotheses question if there is a positive relationship between operating performance and the following dimensions: (i) the stake held by top 3 shareholders before IPO; (ii) its change following IPO; (iii) the presence of private equity firm before IPO; (iv) the presence of private equity firm after IPO. First, it should be noted that, descriptively, the hypothesized relationships have been confirmed. Top 3 shareholders and the presence of private equity firms have positive impact on operating performance, both before and after IPO. Having said that, the analysis reports that not all the relationships are significant.

Referring to the period before the IPO, and in particular to the 3 years pre-IPO, significant relationships are only reported with the dependent variable ROA. In particular, top 3 shareholders (TOP_3_Pre_IPO) and private equity firms (PE_Pre_IPO) have positive effect on ROA before IPO (H1b and H3b). Regarding the other 2 dependent variables, EBITDA Margin and Sales Growth, they both report positive non-significant relationships with the 2 independent variables. Looking at the change recorded between post-IPO and pre-IPO years, no relationship is significant, although they all report positive signs, except for sales growth. The hypotheses that ownership concentration and structure influence operating performance are verified for the years before IPO, but they cannot be generalized for the years subsequent the listing. This is an interesting finding of the paper, which should need further investigation. When the firm is private, we find support for the agency theory, while when it becomes public, the agency theory does not hold anymore. Before going public, a decrease in ownership by top shareholders results in a decrease in operating performance. The same happens with private equity participation. If the firm is PE-backed before the IPO, this participation has a positive and significant impact on operating performance. After IPO, firms in our sample report a decrease in operating performance which is not explained by the agency theory. One of the reasons could be that, once it becomes public, the firm is controlled by the market through investment banks' research analysts. Knowing that, top shareholders and managers act in the behalf of the firm and investors.

Literature has found many reasons why operating performance after IPO is not related to ownership.

One could be that IPOs do not bring to an important misalignment of interests between shareholders and managers because usually pre-IPO owners and managers keep a remarkable investment in the firm in the first years of public trading. In our sample, top 1 shareholder goes from 67% of ownership before IPO to 46% on average (the median values decreases from 67% to 49%) and top 3 shareholders reduce their stakes from 88% to 58% on average (the median value changes from 97% to 59%). Another reason is that other mechanisms are usually used to align interests, such as compensation linked to share prices (Pukthuanthong et al., 2007). Third, it could be a window-dressing situation (window dressing hypothesis): under this situation, managers enhance the accounting numbers of their firms prior to going public. In order to receive a better valuation, managers may be tempted to exaggerate the firms' pre-IPO earnings and this will bring to a situation of post-IPO understated performance (Teoh et al., 1998; Ahmad-Zaluki, 2009). Fourth, entrepreneurs might time the IPO so to take

advantage of windows of opportunity (the so called windows of opportunity and market timing hypothesis). Firms can decide to go public in periods of unusually good performance, which will not be sustained in the future. By doing so, the firm receives a high valuation at IPO, which is then followed by a decrease in the following years (Ritter, 1991; Loughran and Ritter, 1995; Yan and Cai, 2003). Fifth, Benninga et al. (2005) develop a theoretical model proving that owners decide to take their firms public before profitability declines. Finally, this could also be explained by the signaling hypothesis: the extent of ownership is seen as a signal to overcome the information problem and increase the value of the firm (Leland and Pyle, 1977).

An analysis over the control variables reveals that the number of employees (LN_EMP) has always a negative impact on operating performance, highlighting the fact that the cost of labor is one of the main causes of operating performance decline. The coefficients are statistically significant for ROA and sales growth in the pre-IPO analysis, and for the EBITDA margin in the change analysis.

As expected, also age has a negative impact on operating performance. Older firms have usually already reached maturity or decline phase at the time of IPO.

Bank debt has not a univocal effect, as it shows positive and negative impact indiscriminately.

Finally, the percentage of shares sold by existing shareholders (Sec_Share) has a positive impact on operating performance after the listing, meaning that the more the shares sold by existing shareholders at IPO, the better. This is somewhat surprising, since one would expect that a high level of secondary shares sold might indicate that existing shareholders want to partially or fully cash their investment in the firm. Our result might support the hypothesis that, once the firm goes public, it becomes more controlled by the market. If existing shareholders sell a high quantity of their shares to the market, the firm is less controlled by top shareholders and managers and this might influence their behavior.

Finally, the analysis over sales growth is not very indicative, probably due to the fact that net sales are influenced by many different factors. Hence, sales growth is likely not a good index of performance to take into account when performing this kind of analysis.

6. CONCLUSION

The aim of this research is to establish a series of important and interesting findings concerning the operating performance of Italian IPO firms and ownership structures.

In particular, following the agency theory (Jensen and Meckling, 1976), we examine how

ownership affects operating performance, both before and after IPO. Studies conducted on US public firms confirm that ownership and performance are strongly related (Mikkelson and Partch, 1985; Morck et al., 1988; Wruck, 1989). The first evidence of a positive relation between ownership change and operating performance following IPO is that of Jain and Kini (1994). They find that post-IPO operating performance declines after the IPO, and this decline is smaller for firms where entrepreneurs retain more equity. Some studies conducted outside the US find partial support for the ownership change hypothesis (Kutsuna et al., 2002; Kim et al., 2004; Wang, 2005; Bonardo et al., 2007), while other reasons are also verified (Cai and Wei, 1997; Kurshed et al., 2003; Álvarez and Gonzalez, 2005; Coakley et al., 2007). This research adds empirical evidence to the rather mixed literature.

The sample is made of all firms that went public on the Italian Stock Exchange over the period 2003-2009. This period allows to isolate the effects deriving from the "bubble" years (1999-2000) and its consequences (2001-2002), and to have accounting data for the EBITDA margin, ROA and sales growth for the 3 years following the IPO. The analysis is conducted over three operating performances that have received much attention in the literature: EBITDA margin, ROA and sales growth (Cai and Wei, 1997; Kutsuna et al., 2002; Meles et al., 2014). Two major dimensions of ownership are taken into consideration: ownership concentration, represented by the stake held by top 3 shareholders, and owner type, represented by the presence of private equity firms among firms' shareholders. In the analysis we also used top 1 shareholder at the time of IPO as a proxy but we had to exclude it due to strong collinearity problems with the top 3 shareholders' proxy. The hypotheses question if positive relationships are found between operating performance and top 3 shareholders and private equity firms, respectively. We distinguish two different periods: the pre-IPO years, from three years before IPO to the year before IPO (Year -3, -2, and -1), and the post-IPO years, from the year of IPO to three years after IPO (Year 0, +1, +2, and +3). We perform 2 econometric analyses, the first one over the years before IPO and the second one comparing the changes recorded in the two periods, the pre- and post-IPO years. The analysis brings some interesting findings, which need to be carefully analyzed. First, we find that, in the sample, the hypothesized relationships are all verified, although only some are significant. In particular, before IPO, top 3 shareholders (TOP_3_Pre_IPO) and private equity firms (PE_Pre_IPO) have positive effect on ROA (H1b and H3b). EBITDA Margin and Sales Growth both report positive, although non-significant, relationships with the 2 independent variables. This means that, before going public, increases in ownership by top shareholders and the presence of private

equity firms result in increasing operating performance. Looking at the change recorded between post-IPO and pre-IPO years, no relationship is significant, although they all report positive signs, except for sales growth. This means that we cannot generalize our findings for the years subsequent the listing. This is an interesting finding of the paper, which should need further investigation. After IPO, firms in our sample report a decrease in operating performance which is not explained by the agency theory. One of the reasons could be that, once it becomes public, firms' managers are controlled by the market through investment banks' research analysts. Knowing that, top shareholders and managers act in the behalf of firms and investors.

Other hypotheses try to explain operating performance declines after IPO. For example, this phenomenon could be due to a window-dressing situation, windows of opportunity or could be explained by the signaling hypothesis.

Future research should tests other possible explanations for the Italian market, although the windows of opportunity hypothesis doesn't seem an exhaustive explanation, as reported by Pagano et al. (1998).

Our research contributes to the understanding of this phenomenon in Italy. Previous research has shown the existence of a non-linear relationship between ownership structure and operating performance, suggesting the presence of a curvilinear relationship between managerial ownership and post-IPO performance (Bonardo et al., 2007). Our sample adds new evidence to this phenomenon, because the graphical representation of data does not suggest a relationship different from a linear one, as can be seen in Figures 1, 2, and 3. Regarding the analysis on private equity participation, Meles (2011) only compares post-issue median profitability measures of PE-backed and non-PE backed IPOs and does not perform any econometric analysis on these data. In addition, as far as we are aware, this is the first study to analyze the relation between ownership and operating performance before IPO in the Italian market. This increases the awareness of the Italian market and suggests to perform new investigations.

With our research we expect to give contributions to entrepreneurs of private firms, since higher ownership retention by top shareholders increases control and increases managers' incentives to act in the interest of the firm. In addition, it also sheds lights on the important role of private equity firms when participating in private firms, since their presence increases operating performance as well. What our research does not help to understand is what causes operating performance decline when firms go public, and this will probably be the focus of

future researches.

A look at the control variables provides some interesting findings as well. The number of employees has a negative impact on operating performance, highlighting the fact that the cost of labor is one of the main causes of operating performance decline. As expected, also age has a negative impact on operating performance. Older firms have usually already reached maturity or decline phase at the time of IPO.

Finally, and surprisingly, the percentage of shares sold by existing shareholders (Sec_Share) has a positive impact on operating performance after the listing, meaning that the more the shares sold by existing shareholders at IPO, the better. One would expect that a high level of secondary shares sold might indicate that existing shareholders want to partially or fully cash their investment in the firm and this might cause a misalignment of interests between new shareholders, on one side, and old shareholders and firm's managers, on the other side. Having reported the opposite effect, we find support for the hypothesis that, once the firm goes public, it becomes more controlled by the market. Knowing that and fearing market's control, shareholders and managers are more aligned with investors' interests and prefer to act in the behalf of firms and investors.

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CONCLUSIONS

The decision of a firm to go public posits many important problems, among which there are how to reduce information asymmetries and uncertainty surrounding private firms and how to preserve and improve firms' value. Academics have been studying issues related to IPOs for decades but the debate is still actual, since the phenomenon is very complex and sensitive. Signaling theory is a relative recent theory and one of the main used in the IPO literature, because it aims to resolve the information asymmetry problem suggesting to rely on certain indicators that can send signals to the market about the quality of firms.

Another important theory applied to the IPO context is the agency theory, as the separation of ownership and control posits problems to firms' profitability and value. Both theories have been largely applied to the US context and the goal of this dissertation is to contribute to these long-standing debates by adding evidence from a non-US country. Evidence from foreign countries has shown that institutional settings are important to consider when generalizing theories. This dissertation confirms this thesis, showing that signals are not always correctly perceived and valued by the market, and that theories may not work in different contexts. One of the key concepts of this dissertation is that market efficiency and experience are important prerequisites for the strength of the economy and firms' profitability. The underdevelopment of the financial market is a big limit for a country's economic growth because it drastically reduces the sources of financial resources available to firms and the possibility of making profits for investors.

The purpose of this dissertation was to study the impact of the main players who participate to IPOs to firms' performance in a bank-oriented system like Italy. Most of previous research has focused its attention on the Anglo-Saxon context, which is almost antipodal to the Italian scenario. The results of this dissertation aim to contribute to the international evidence, which is still growing and consolidating. The structure of this dissertation is as follows:

1. Chapter I: "The Impact of Third-Party Certification on Italian Initial Public Offerings";
2. Chapter II: "Lending Relationship and the Role of the Underwriter: Evidence from Italian IPOs";
3. Chapter III: "Ownership Pre- and Post-IPOs and Operating Performance of Italian Firms".

The findings of each chapter are summarized in the following paragraphs.

* * * * * * * *

Chapter one presented the signaling theory, investigating the role that private equity firms, underwriters and auditors play during IPOs. The focus has been on the impact of these players' reputation on IPO performance, measured by underpricing and opportunity cost of issuance. Measuring reputation has been one of the key issues of the chapter as this is the first attempt on the Italian market. For these reasons we appealed to indicators commonly used in the academic literature. We tested the certification role of these players on a sample of all IPOs listed on the Italian Stock Exchange over the decade 2003-2012. This period allowed us to isolate the effects deriving from the "bubble" years (1999-2000) and its consequences (2001-2002). The sample was made of 98 IPOs, out of which 37 were PE-backed. Results showed that only auditors are perceived by the market as good certifiers of firms' value. Aside from this, we found that there is no significant difference between firms backed by reputable private equity firms and other firms, and between firms which hire reputable underwriters and firms which don't. We also analyzed the impact of private equity backing on IPO performance and found no significant difference with non PE-backed firms. Both phenomena are in line with evidence from other European countries and cannot be explained following the certification theory but need further investigation. Other hypotheses should be tested on the Italian market, mainly the grandstanding and the adverse selection. With this research we aim to contribute to the understanding of this phenomenon in bank-oriented countries and to enhance the understanding of the European environment. The issue that private equity firms' and underwriters' certification effect does not hold in the Italian market is very important because it shows that the underdevelopment of stock market is a weakness for the economy and a limit for firms' profitability. In the young Italian financial market, investors are not able to fully recognize the value-added and certification role of private equity firms and underwriters. It would be very interesting to test whether the conjecture that as the financial market becomes more mature, investors learn more about the role of private equity firms and underwriters, and that consequently the observed inefficient patterns disappear. Although, at least a couple more years have to pass in order to have some more observations and make this analysis feasible.

With this research we expect to give contributions to entrepreneurs facing quotation. During an IPO, shareholders can convey information regarding the firm's quality using credible signals. Knowing which signals perform better than others can help firms decide what strategy to follow. Finally, we also expect to give contributions to investors scouting the IPO

market, who can reduce information asymmetries and choose high quality investments exploiting informative signals.

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In chapter two we looked at the role of the underwriter at IPOs, juxtaposing two hypotheses: certification and conflict of interest. These are two opposite effects that the presence of an underwriter with previous lending relationship can cause to outside, uninformed investors. The chapter draws from the signaling theory by analyzing which of the two effects prevails. On one side, lending relationships can reduce the problem of asymmetric information between the firm and the market (the certification hypothesis), while, on the opposite side, banks can have incentives in using private information gained through their lending activities for their personal profit (the conflict of interest hypothesis). Evidence from Europe and Asia indicates that the conflict of interest effect is much stronger and often dominates the certification effect, while evidence from the US market is consistent with the certification hypothesis. We performed a short-run and a long-run analysis, over underpricing and price revision on one side, and market-to-book ratio at 2 and 4 years after the IPO on the other side. We tested these hypotheses on a sample of all IPOs listed on the Italian Stock Exchange over the period 2003-2009. The sample was made of 58 IPOs, out of which 32 had lending relationships. The examination period has been chosen in order to isolate the "bubble" years (1999-2000) and its subsequent effects (2001-2002), and to have market and accounting data for the analysis on post-IPO performance.

As far as we are aware, this is the first study to investigate the certification and conflict of interest hypotheses when the IPO underwriter has pre-existing lending relationships with the issuer in the Italian market and one of the few in the European contest.

We found that at the time of IPO, investors rely on the certification role of the lending bank and require lower underpricing, validating the certification theory. This result was somewhat surprising. In fact, European and Asian results are more towards a prevalence of the conflict of interest hypothesis (e.g. Hamao et al., 2000; Ber et al., 2001; Bessler and Kurth, 2007) and the Italian market has an institutional setting similar to most European countries and opposite to the Anglo-Saxon financial system, the former being a bank-centered system and the latter characterized by well-developed equity markets. For this reason, and for the fact that pre-IPO lending relationships may affect post-IPO performance, we broadened the analysis to see whether the certification effect held in the long run. Indeed, the analysis conducted over the market-to-book ratio at 2 and 4 years following the IPO showed an

opposite trend, making the conflict of interest effect prevail. The results question the ability of the Italian market to correctly evaluate IPOs, highlighting the fact that the Italian equity market is still young and probably inefficient under this point of view. When a firm goes public, market investors positively value the presence of a lending bank as underwriter. Then, the conflict of interest effect prevails, meaning that probably issuers brought to the market by lending banks are low quality firms and banks take advantage of private information gained through their lending activities for their personal profit. During IPOs, underwriters fool the public into buying overpriced issues. Due to the low efficiency of the Italian market, investors wrongly pay a higher price (require lower underpricing) for issues underwritten by lending banks and this reveals in the long run, when these stock prices drop more than others.

Hence the evidence that in European and Asian nations the conflict of interest effect is much stronger and often dominates the certification effect is partially confirmed also for the Italian market, although this is not straightforward due to the low experience of investors, which overpay shares brought to the market by underwriters with lending relationships. This result questions the generalization of theories when institutional environments are different.

In summary, the evidence that international results are rather mixed suggests that discrepancies might be partially explained by

different regulatory environments and quality of the financial markets. This research adds empirical evidence to the rather mixed literature and sheds lights on financial institutions' behavior in a poorly developed financial market.

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Chapter three focuses on firms' post-IPO performance and, in particular, on the causes of firms' performance deterioration after IPOs. Using the agency theory, we tested if it results from the separation of ownership and control deriving from the entrance of outside investors in the firm.

International evidence confirms post-issue declines, but reasons are not univocal. Studies conducted in the US find support for the agency theory, while studies conducted in other countries also present different explanations. A previous study conducted on the Italian market proposes the presence of a curvilinear relationship between ownership and post-IPO operating performance (Bonardo et al., 2007). In this chapter, we took into consideration two major dimensions of ownership: a quantitative one, indicating ownership concentration and represented by the stake held by top shareholders, and a qualitative one, about the type of shareholder and relative to the presence of private equity firm both before and after the IPO.

We questioned if there are positive relationships between operating performance and the following dimensions: (i) the stake held by top 3 shareholders before IPO; (ii) its change following IPO; (iii) the presence of private equity firm before IPO; (iv) the presence of private equity firm after IPO.

We examined the effect of ownership on operating performance on a sample of Italian firms listed on the Italian Stock Exchange over the period 2003-2009. The examination period has been chosen in order to isolate the "bubble" years (1999-2000) and its subsequent effects (2001-2002), and to have accounting data for post-IPO performance indexes. The sample was made of 58 IPOs, out of which 26 were PE-backed at the time of IPO. We chose three operating performances commonly used in literature: EBITDA margin, ROA and sales growth and performed two econometric analyses, the first one over the years before IPO and the second one comparing the changes recorded in the two periods, the pre- and post-IPO years.

The analysis brought some interesting findings, which needed to be carefully analyzed. First, all the hypothesized relationships were verified, although only some of them were significant. In particular, the analysis was significant for the pre-IPO period, not for the post-IPO years, meaning that we could not generalize our findings for the years following the listing. This was an interesting finding of this chapter, which should need further investigation. After IPO, firms in our sample reported a decrease in operating performance, which was not explained by the agency theory. Previous research showed the existence of a non-linear relationship between ownership structure and operating performance, suggesting the presence of a curvilinear relationship between managerial ownership and post-IPO performance (Bonardo et al., 2007). Our study contributes to the understanding of this phenomenon in Italy, as the graphical representation of data does not suggest a relationship different from a linear one, although it must be noted that we used a different proxy of ownership.

Other hypotheses try to explain operating performance decline after IPO. For example, this phenomenon could be due to a window-dressing situation, windows of opportunity or could be explained by the signaling hypothesis.

Future research should tests other possible explanations for the Italian market, although the windows of opportunity hypothesis does not seem an exhaustive explanation, as reported by Pagano et al. (1998).

As far as we are aware, this is the first study to analyze the relation between ownership and operating performance before IPO in the Italian market, increasing the awareness of the Italian market and suggesting to perform new investigations. With this result we expect to

give contributions to entrepreneurs of private firms, since higher ownership retention by top shareholders increases control and increases managers' incentives to act in the interest of the firm. In addition, it also sheds lights on the important role of private equity firms when participating in private firms, since their presence increases operating performance as well. What our research does not help to understand is what causes operating performance decline when firms go public, and this will probably be the focus of future researches.

Finally, one of our control variables reported a somewhat surprising result. We found that the percentage of shares sold by existing shareholders has a significant and positive impact on operating performance after the listing, meaning that the more the shares sold by existing shareholders at IPO, the better. One would expect that a high level of secondary shares sold might indicate that existing shareholders want to partially or fully cash their investment in the firm and this might cause a misalignment of interests between new shareholders, on one side, and old shareholders and firm's managers, on the other side. Having reported the opposite effect, we found support for the hypothesis that, once the firm goes public, it becomes more controlled by the market. It is likely that, knowing and fearing market's control, shareholders and managers are more aligned with investors' interests and prefer to act in the behalf of firms and investors, instead of acting in their own interests.

The results of this chapter suggest to perform further investigations on the causes of post-IPO performance decline.

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