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Sponsorship impact on financial markets: VC, PE, and non-sponsored companies

Riccardo BRUNO

SUPERVISOR

Nicola BORRI

CO-SUPERVISOR

Lucie CHEKROUN
No. 796711

CANDIDATE

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1. Declaration of Originality

I hereby declare that I am the sole author of this master's Thesis. This work is the result of my own independent research and effort. I confirm that I have been properly informed regarding the normal academic citation rules and that I have read and understood the plagiarism guidelines provided by LUISS University for the completion of this end-of-studies master's thesis.

The citation standards expected in this exercise have been respected and I understand that this work might be tested for plagiarism.

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Date

Lucie CHEKROUN

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3. Introduction

3.1 Research Problem

For a Private Equity fund, there are three main ways to exit an investment in a company: sale, failure, or IPO. While Private Equity operates within private markets and IPOs belong to public ones, it is relevant to study some links between these two worlds. One such link is the impact and influence of Private Equity (buyouts and venture capital) sponsorship on the stock performance of the company. Furthermore, do differences appear between the stock performance of Venture Capital-backed and Private Equity-backed companies?

This study is relevant, as it could serve as a basis for investors, retail or professional, to decide whether a stock is a good investment. It may represent a starting point for investment decisions, considering that Venture Capital or Private Equity-backed companies may underperform, outperform, or show no significant difference in comparison to non-backed companies. It is also worth studying because the existing literature presents results for similar scenarios in the US, India, UK, Nordic countries, and Brazil, but no recent study has been conducted for France and Italy. This research is engaging, as results might change depending on geographic context or time period (due to regulations, investment habits, etc.).

This research aims to provide both specific insights and general knowledge for those who may be interested in using it. Depending on the results, asset managers, retail investors, or other professionals such as wealth managers or private equity investors, could be influenced in their decision to invest in a specific stock category. For example, they might choose to invest in Private Equity-backed companies, if they expect the stock to outperform the index. This could also be of interest to Private Equity General Partners, as it may influence how they structure their contracts with Limited Partners. For instance, by allowing a portion of public investment (after the lock-up period) or by preferring IPOs as a potential exit for their participations, should they expect higher returns.

This research will focus on the 2005-2021 period. All IPOs completed on Euronext Paris, and Borsa Italiana (which became Euronext Milano on October 25, 2021) during this period will be considered and divided into three categories: Venture Capital, Private Equity (meaning buyout investment funds), and non-backed companies.

3.2 Research Questions

The main research question concerns the performance of Private Equity-backed companies (both Venture Capital and Buyout) on the stock market, in the short-run (overpricing or underpricing) and in the long-run (36-month performance): do Private Equity-backed companies perform better than non-backed companies? This leads to several sub-questions regarding the differences between Buyouts and Venture capital investments. Do Buyouts perform better than Venture Capital-backed companies in the long run? And in the short run? What are the main drivers of long-term performance?

4. Conceptual Background and General Theory

4.1 Conceptual Background

4.1.1 General Functioning of Private Equity Funds

It is important for readers to understand how Private Equity funds work. This section begins with an overview of the Private Equity, with a focus on their structure and the mechanisms through which they create value.

Private Equity funds are managed by General Partners (GPs), representing the fund's management and investment team. They receive committed capital from Limited Partners (LPs), that may include High Net Worth Investors (Family Offices), insurers, pension funds, funds of funds, or other institutional investors. This money is then invested into private companies according to specific criteria defined in the mandates linking GPs to LPs. GPs owe a share of the performance in return to LPs, the hurdle rate (Axelson et al., 2009).

Private Equity funds invest at different stages of a company lifetime. Four stages in a company lifetime are typically distinguished: seed investment, growth investment, late-stage investment, and maturity investment. These stages can be divided into two categories: Venture Capital and Buyouts investments. Venture Capital funds usually take a minority interest in a company and aim to sell it at a premium after several years (mainly seed and growth investments) while Buyout funds operate through Leverage Buy Out (LBO), mainly on late-stage and maturity investments.

Leverage Buy Out (LBO) is a method specific to Buy Out funds, allowing them to acquire companies using a lower amount of capital thanks to the leverage (debt provided by banks or private debt funds). Venture Capital and Buyout funds' modus operandi differ on targets, industries, return on investment, investment size, investment period, ownership, financing structure, and investor role (Demaria, 2020).

Both types of investors are involved in advising the companies (Demaria, 2020) in their portfolio to maximize the performance, with the goal of eventually selling them at a higher price than the purchase value. Their expected return on investment is high, as it is a risky strategy, because companies are relatively small (startups to mature companies), even though they tend to minimize investment risk by analyzing the activity, working capital need, capex intensity, market conditions, and management quality.

Investment funds, whether Venture Capital or Buyout funds, can be sector-specific (TMT, Infrastructure, Food & Beverage, Business Services, Software, etc.) or sector-agnostic. They

invest in companies of various sizes (small, mid, or large capitalization deals). Small cap being often considered as deal value lower than €100m, mid cap between €100m and €1bn and large cap above €1bn – but no unified definition exists regarding these thresholds.

4.1.2 Value Creation within the Private Equity Industry

Value creation in the Venture Capital industry has been studied by Hellmann and Puri (2002). They argued that Venture Capital funds, which focus on early-stage companies, bring rigor and professional behavior to companies they support. These funds monitor their portfolio companies, sometimes by replacing the current CEO, or introducing stock-option plans and other incentive mechanisms to engage management and align interests. On another study, Hellmann et al. (2008) explain that greater collaboration between the fund and the invested company improves the company's performance.

Value creation performed by Buyouts funds has been the object of many studies with different outcomes.

Jensen (1997) explains that most of the value generated in an LBO comes from the use of a debt. As the company must repay a significant amount of debt, managers are encouraged to be more prudent about their decisions and are pushed to improve performance. His paper focused on large, liquid corporations where managers typically have fewer incentives to take risks or fear failure. Cao and Lerner (2009) found that during "P-to-P" (Public to Private) takeovers, a diversified capital structure (combination of debt and equity) increased the corporate governance of the firm and created value through strong incentives. Leverage buyouts do not harm long-term firm performance to the profit of short-term gains (Lerner et al., 2011). Private Equity funds also create operational value through leverage buyouts by elaborating and adopting a clear strategic vision for the firm, facilitating access to key resources (R&D, business opportunities, experience from other portfolio companies, M&A…), and improving reporting and planning processes (Thomas, 2019).

4.1.3 The Rise of Private Equity Activity

Private Equity is a long-standing practice, with roots from British and French colonial empires in the XVIIIth and XIXth centuries to finance the industrial revolution. This practice experienced a true boom in the 1980s, marked by a rapid expansion in the number of Private Equity funds, from dozens to more than 650 (Bouteiller and Karyotis, 2018). As previously mentioned, Private Equity funds rely on leverage to buy out companies. One of the main challenges at the time was how to finance acquisitions through debt, in other words, how to gain access to

leverage in order to combine it with equity capital and minimize the amount directly invested by the fund. Today, access to both debt and equity fundings is much easier than before. Institutional investors, attracted by the high return offered by this asset class, widely invest in this asset class, explaining the increasing number and the appeal around Private Equity funds (Nielsen, 2008).

4.1.4 Economic Weight and Exit Strategy

Nowadays, Private Equity funds (Buyout funds or Venture Capital funds) managed wide amounts of committed capital provided by Limited Partners. Their economic weight is significant with more than €1,500bn in Assets under Management in Europe (Santander, 2025). As committed capital continues to rise, funds have investment obligations, explaining the 12% annual increase on average commitment to Private Equity funds in Europe, starting from €55bn raised in 2015 to €133bn in 2023 (Statista Research Development, 2024).

Private Equity funds have several exit options for portfolio companies: trade sales (meaning sale to a strategic investor), secondary buyouts, dividend recapitalization (new leveraging of the company to issue an exceptional dividend to the benefit of the investment fund), liquidation (if things go the worse way) or IPOs. The most common exit way for funds is trade sales, followed by secondary buyouts and then by IPOs (Bain & Company, 2025). IPOs are less considered as a potential exit for investment funds as it comes with many obligations. Investment funds often cannot fully exit at the time of the IPO due to a lock-up. IPO also comes with large transaction cost. It is often a lengthy process and requires a lot of reporting, and exposure to more transparency. Even though Gompers (1995) showed in its study that IPO was the most profitable exit for fund investors as they add liquidity value criteria to the offer, IPO divestments represent between 5% to 10% of divestments in Europe from 2017 to 2024 (Invest Europe, 2024). While there is a lot of research on IPO Performance and on Private Equity Funds, limited attention has been giver to the relationship between the two: particularly, the stock performance of ex-Private Equity-backed companies.

4.2 General Theory

This paper focuses on stock performance and abnormal returns. It examines capital markets and more specifically equity markets, since an Initial Public Offering (IPO) involves listing a company's shares on a public market. Several fundamental principles are worth recalling when discussing equity markets. Among them are the Efficient Market Hypothesis introduced by

Fama (1970), and other general determinants of an IPO (timing and information asymmetry), which are described hereafter.

4.2.1 Efficient Market Hypothesis

Fama (1970) argues in one of his famous works that the primary role of capital markets is to connect ownership with economy's capital. The most important information to link correctly is the perfect reflection of accurate signals on resource allocation for investors. It is the key factor for investors security-picking. Markets are meant to be efficient when prices fully reflect available information for shareholders. Fama (1970) defines three levels of market efficiency: weak form with only historical prices, semi-strong form with access to public information and strong form with access to every possible information.

In the weak form, prices reflect historical information but do not reflect future expectations. In this sense, past prices are independent of future prices and trading strategies cannot offer excess returns for investors.

In the semi-strong form, the market reflects both historical prices and newly released public information. Fama finds no consistent evidence that market participants can predict future prices based on public data.

In the strong form, composed of the semi-strong form plus insider information, even with that amount of information, investors will not be able to generate returns higher than market returns. No one can beat the market.

4.2.2 Information Asymmetry

Information asymmetry refers to the gap in the possession of information between two parties. In the stock market, under the semi-strong efficiency level, investors rely on two key elements to guide their investment decision: historical prices and price adjustment following public announcement. This semi-strong efficiency level creates fear for investors as they may not be in possession of complete information regarding securities, leading to a loss of investor confidence (Lambert et al., 2012).

Information asymmetry is a key determinant of an IPO process (Ma, 2007) and can significantly affects pricing because of investors that are misled by issuers to see a higher quality company (window dressing). A persistent information gap exists between company insiders and potential investors. As owners want to have a higher first trading day performance, they might be strategic about the information they disclose. Strong top management team legitimacy tends to decrease underpricing and more generally speaking, information asymmetry is a factor of overpricing (Cohen and Dean, 2005).

4.2.3 IPO Timing

There is a first question, before considering the question of timing: why to go public? Ellingsen and Rydqvist (1997) identified several motivations for companies to go public: raise funds to grow, acknowledge people on the company, motivate employees and cash-in to get rid of financial interest in the company. Once these motivations are understood, the importance of timing becomes clear.

For an entrepreneur, a crucial strategic decision question may be: when to take the company public? The Initial Public Offering is a technical and time-consuming process and typically arises at a turning point in the company's development. Entrepreneurs must ask themselves whether they want to expand and raise funds, they want to cash out, or they want to stick to the current guidelines and remain private.

When pursuing a public listing, the major concern becomes timing. As a single company cannot control the market, it must strengthen the aspects it can manage. Strong business model, strong management team, solid infrastructures, good reporting, and ramp-up time are to be managed (Deloitte, 2016). IPO timing can be assessed from two perspectives: the company's internal view and the broader marker context.

From a company perspective, managers may want to go public when the company is at peak, meaning that the company's performance is great and that managers are enthusiastic about it (Ritter, 1991). Market expectations are then high, meaning that there is a maximization of the share price in the short run before decreasing when investors reevaluate the stock (Ritter, 1991).

From a market perspective, two main factors influence IPO timing: historical events and market volatility.

Global financial markets faced crashing events in the last 20 years (dot-com bubble, subprime mortgage crisis, COVID-19) often followed by recovery periods that could last up to 3 years (Deloitte, 2016). It is then a risky idea to try to set the good timing the IPO process as the world faces long periods of low activity. But the past does not reveal the future.

Another key factor to consider when timing an IPO is market volatility. This is often measured by the VIX index, which tracks how much investors expect returns on the S&P 500 to fluctuate. Pastor and Veronesi (2005) highlighted that there are disparities in IPO waves with preventing signals such as high market returns, increases of a company's profitability, newly created companies overvalued and return volatilities.

Michala (2016) found that the IPO timing behavior of Private Equity (Venture Capital and Buyout) backed companies does not significantly differ from that of non-backed firms. He also observed a declining trend in the volume of IPOs during so-called hot market periods.

5. Literature Review

This study focuses on three samples of IPO: Venture Capital-backed companies, Private Equity-backed companies, and non-backed companies. For these three samples, two indicators will be studied: short-term performance, represented in this case by the pricing of the IPO on its first trading day, and long-term performance, calculating abnormal returns over a 3-year period.

5.1 Short-Term Performance

As viewed before, sponsored companies, at the time they are being possessed privately by a venture capital or buyout fund, have, on average, better operational functioning than non-sponsored companies through incentives or external advisory. This study will focus on post-IPO performance.

By short-term performance, it is meant underpricing or overpricing of a stock on its first trading day. By underpricing, it is here said that a stock is underpriced when its stock price is higher on its first trading day closing than at the opening. By overpricing, it means that its stock price is lower on its first trading day closing than at the opening. Initial Returns and Underpricing / Overpricing are here used interchangeably.

It is then important to look at what has already been done as studies on different geographical areas and look at the possible differences in the first day of trading for global IPOs, then to focus on Venture Capital-sponsored IPOs and finally on Private Equity-sponsored IPOs.

5.1.1 Global Short-Term Performance of IPOs

Information asymmetry has a role in the pricing of an Initial Public Offering. There are two main types of information asymmetry in an IPO: issuer and underwriter, and privileged investors and uninformed investors (Baron, 1982). Investors, among them, have a different degree of information on the true value of a company. Privileged investors, whose knowledge of the offer is better, might take a higher proportion of the share offer in good issues. Then, the issuing company fixes a lower offering price to target all investors within the subscription period, causing underpricing (Rock, 1986).

Loughran and Ritter (2004) expressed in their study that the average first-day return of IPO is a moving trend that fluctuates over time. Depending on the period, the market appreciated IPOs in different ways: in the 1980s, the first day return was on average 7%, to 15% in the 1990s and

up to 65% during the dot-com bubble in 1999-2000. It is here a situation of clear underpricing for IPOs on the US market.

In Europe, for the period 1996-2000, Goergen et al. (2003) found out that IPOs on Brussels Stock Exchange (to become Euronext Brussels) had an average underpricing of 10.36% in their first three trading day. Rogiers, Manigart and Ooghe (2003) extended the period of the study from 1984 to 1999 and found a 14.6% underpricing in initial returns. IPOs listed on Paris Bourse (to become Euronext Paris) had on average a 22.76% underpricing in their first trading day (Chahine, 2004). Derrien and Womack (2003) extended the period from 1983 to 2000 and found an 11.6% underpricing in initial returns. For companies listed on the *Amsterdamse Effectenbeurs* (to become Euronext Amsterdam in 2000), Goergen et al. (2003) found an impressive 86.07% underpricing in their first trading day. Ljungqvist et al. (2003) extended that period from 1982 to 1999 and found an average underpricing of 10.2% in initial returns. On the Italian Stock Exchange, Cassia et al. (2006) found a 21.87% underpricing for the period 1985-2001.

On average, in Europe, IPOs are underpriced. More generally speaking, Loughran, Ritter and Rydqvist (1994) found out that IPO underpricing was present in 25 countries, with higher underpricing in emerging countries than developed countries. This existing literature highlights one main issue: the existing studies on the subject are not recent anymore. It does not consider events that occurred in the market since then (subprime mortgage crisis, recovery, and beginning of the COVID-19 pandemic). The next section will focus on the pricing of sponsored IPOs at an early stage, meaning backed by Venture Capital funds.

5.1.2 Short-Term Performance of Venture Capital-sponsored IPOs

Venture Capital funds invest in the early stage of a company. They invest in rising market stars, in high-growth sectors, to generate a high return on investment. Usually, they invest a minority investment in equity and advise the company, its network and look at the cash burn of companies they invest in.

Megginson and Weiss (1991) studied the performance of Venture Capital-sponsored IPOs between 1983 and 1987. They found in their study that Venture Capitalists tend to show to all investors the true value of the company and reduce underpricing. Presence of Venture Capitalists in the issuing company lowers the IPO costs and maximizes the proceeds for the issuing company. Then, Venture Capital-sponsored IPOs reflect a lower level of underpricing than non-sponsored IPOs. It is also important to note that Venture Capital funds keep a portion of the newly listed equity, even after the lock-up period ends (Megginson and Weiss, 1991).

Venture Capital funds, keeping a portion of the issue, is a signal for operational and market efficiency. Globally, Venture Capital-sponsored IPOs tend to generate lower underpricing than non-sponsored IPOs through value certification. But do other factors affect the initial return criteria of Venture Capital-sponsored IPOs?

Coakley, Hadass and Wood (2009) studied a large sample of 591 IPOs on the London Stock Exchange from 1985 to 2003 and discovered that underwriters also play a role in the underpricing, with underpricing levels that differ over time in correlation with money left on the table and operating efficiency decreasing. Their study also highlighted that during the dot-com bubble (1998-2000), the combination of venture capitalists and famous underwriters was directly linked with the highest underpricing mechanisms.

Same comment as in the previous section applies here regarding the seniority of the existing literature.

If Venture Capital sponsored IPOs initial returns show less underpricing than non-sponsored IPOs, what does the literature say about Buyout sponsored IPOs? It will then be the focus of the following section.

5.1.3 Short-Term Performance of Private Equity-sponsored IPOs

Buyout funds invest in mature companies that are undervalued or that want to expand. They preferably invest in entry barrier markets and expect a high Internal Rate of Return (IRR). They take control of the company when acquiring it through a mix of debt, equity, and quasi equity (convertible bonds) and become in most cases majority shareholders of the company. Buyout funds could be passive in the management (follow-up investors) or give management guidelines (active investors).

Chou et al. (2006) explained that window dressing was the fact of increasing the viewable value of a company. Buyout funds, by doing that, are limiting, theoretically, the underpricing, by showing "overvaluation" to investors. Hogan, Olson, and Kish's (2001) study of the 1987-1998 period is in line with Chou et al. (2006), showing that Buyout-backed IPOs were 7.64% underpriced while non-backed IPOs had positive initial returns of 13%.

Currently, no recent study exists on the Short-Term Performance of sponsored-back companies (Venture Capital or Buyout funds) in our market focus (Euronext Paris and Borsa Italiana, no Euronext Milano).

5.1.4 Short-Term Performance of Venture Capital IPOs vs. Buyout IPOs

Buchner et al. (2019) in their study, showed through an 851 US IPOs sample from 2000 to 2014, that Buyout-backed IPOs were underpriced (10.7% underpricing on average), but less than Venture Capital-backed IPOs (18.9% underpricing on average) and non-backed IPOs. What about possible evidence in Europe and more precisely in the research market focus?

Levis (2011) used a large panel of 1,595 IPOs listed on the two London Stock Exchange markets, the Official List, and the Alternative Investment Market from 1992 to 2005. He found out in his study that in the United Kingdom, IPOs were underpriced, in value, by an average of 8.5% for Venture Capital-backed IPOs and by 5.7% for Buyout-backed IPOs. The lower underpricing for Buyout-backed IPOs is, following Levis' (2011) theory, a combination of lower risk, more aggressive pricing, and group certification. This study could be a beginning answer to our research question but does not consider events that occurred relatively recently (subprime mortgage crisis, Greek crisis, recovery, COVID-19 pandemic).

Existing literature is interesting as results show consistency, that sponsor reduces underpricing, but with different figures, regarding the period and the studied geographical area. This research paper will fill the gap with the existing literature, bringing a recent study, in a specific market focus (France and Italy) with a large comparison of three datasets: Venture Capital-backed, Private Equity-backed (meaning Buyout-backed companies), and non-backed IPOs.

5.2 Long-Term Performance

As viewed in the previous section, literature shows that IPOs are on average underpriced and there are some differences in underpricing regarding the presence of the sponsor or the studied period. It means that on the first day of trading, IPOs faced higher closing price than opening price.

Long-Term Performance can be analyzed through two forms: the performance from the first trading day, or in comparison to the market. Underperformance, from an intrinsic point of view, means that the share price studied is lower than the first trading day prices. Thus, underperformance provides investors with negative abnormal returns. Overperformance means that the share price studied is higher than the first trading day prices. Thus, overperformance provides investors with positive abnormal returns. Underperformance, from a relative point of view, means that the IPO returns are lower than market returns. Thus, overperformance, from a relative point of view, means that IPO returns are higher than market returns.

5.2.1 Global Long-Term Performance of IPOs

Aggarwal and Rivoli (1990) were the first to study a large panel of long-term performance of IPOs. They observed the first-year performance of 1,598 IPOs in the United States from 1977 to 1987 and analyzed that IPOs show a relative underperformance (-13.73% compared to market return). Aggarwal and Rivoli (1990) confirmed Miller's theory (1977) that the underperformance of IPOs was due to too high optimism about the offering. When euphoria and excitement decrease, investors realize that the true value of the stock had been artificially overvalued.

Ritter (1991) studied the IPO performance over a longer period, i.e., 3 years, when Aggarwal and Rivoli (1990) studied the first-year performance. Ritter (1991) explained that over a sample of 1,526 US IPOs from 1975 to 1984, he also found a relative underperformance of IPO over market returns.

Goergen, Khurshed and Mudambi (2007) showed, from a sample of United Kingdom IPOs, that long-run underperformance was observed, but more interestingly, that the percentage of equity issued, and the multinationalism level of a firm were key indicators of its post-IPO performance. This study also shows that size is an indicator of post-IPO performance. As sponsors operate on different stages of a company's lifetime and are usually a multinationalism indicator, it is then important to study the long-term performance of sponsored IPOs (Venture Capital or Buyout funds) and it will be the focus of our next sections. These studies show a clear gap that this paper will aim to fill as no recent study on the long-run performance of IPOs has been made. It is important as some events occurred since last studies (subprime mortgage crisis, Greek crisis, recovery, COVID-19 pandemic).

5.2.2 Long-Term Performance of Venture Capital-sponsored IPOs

By studying 934 Venture Capital-sponsored US IPOs, Brav and Gompers (1997) found that Venture Capital-backed IPOs performed better on a 5-year horizon than non-sponsored IPOs in the 1972-1992 period. They highlighted the fact that these returns could be generated through higher corporate governance for Venture Capital-backed companies and due to selection process from the funds that target companies to be the future rising stars of their market, generating a high value creation. Their analysis, replicating Ritter's model (1991), suggests that underpricing is not exclusive of new offerings and is wider in financial markets. Krishnan et al. (2011) studied US IPOs from 1993 to 2004 from an operational performance perspective. They used Return on Assets, Market-to-Book Equity Ratio, and Listing Survival rate as operational performance indicators of *ex ante* Venture Capital-backed companies. They also used a fourth

variable that is 36-month abnormal returns as a long-run performance indicator. Krishnan et al. (2011) find supportive evidence that the reputation of the Venture Capital sponsor has an impact on long-term performance through shareholding and board directorship.

Jelic, Saadouni and Wright (2005) contradict Brav and Gompers' (1997) results and find no evidence of a better Venture Capital-backed IPOs long-run performance by studying 167 Venture Capital exits through IPO on the London Stock Exchange from 1964 to 1997.

Results on Venture Capital-backed IPOs long-run performance are not clear enough to dress a clear pattern as studies on this topic are not numerous and do not cover our area of study in a recent period with a clear comparison of datasets (non-backed, Venture Capital-backed, and Buyout-backed). Plus, we find some contradictory results depending on studies (Jelic et al., 2005 vs. Brav and Gompers, 1997). The contribution of this paper will be to fill the current gap in the existing literature, providing recent results on a specific geographical area.

5.2.3 Long-Term Performance of Private Equity-sponsored IPOs

Schöber (2008) studied the performance of 484 buyout-backed IPOs between 1990 and 2001 and found supportive evidence that buyout-sponsored IPOs outperformed the market on a 1-year indicator and that the share price on average impressively decreased from 8 to 32 months after the offering. His results show that over a detention period of 5 years, returns are statistically significant and positive but small. His results are explained by the appeal of investment banks for Buyout-backed companies because they reduce information asymmetry, by disclosing more information. Operationally also, Schöber (2008) explains that managers are more experienced in buyout-backed companies to lead companies to public and that it is a proof of operational efficiency.

Levis again (2011) shows that Buyout-backed companies perform better in the long-run than non-backed companies because buyout funds could find incentives to hold a stake even after the firm went public. It is so because the fund could obtain some earn-outs or other retrocessions that link the performance of the company to it even after the exit. Cao (2011) expresses that operational efficiency of buyout-backed companies remains the same after the fund exit, as before its exit.

While results are consistent in the literature that Buyout-backed IPOs perform better on the long-run than non-backed IPOs, very few studies focus on the French and Italian stock markets or are recent studies. This research paper will provide information over this clear subject in Euronext Paris and Borsa Italiana (which became Euronext Milano). The next section will focus

on the existing studies on the comparison of long-run performance of Venture Capital-backed IPOs and Buyout-backed IPOs as it will be one of the discussing points of this research.

5.2.4 Long-Term Performance of Venture Capital IPOs vs. Buyout IPOs

Buchner et al. (2019) in their study found that, using the Buy-and-Hold Returns method, no differences were shown in the 3-year performance of Venture Capital-sponsored IPOs in comparison to Buyout-sponsored IPOs. This result contrasts the results obtained by Levis (2011) demonstrating that Buyout-backed IPOs performed better on a 36-month performance than Venture Capital-backed IPOs. Long-term performance in Levis' study (2011) is measured by Buy-and-Hold Abnormal Returns and Fama-French 3-factor model while Buchner et al.'s study (2019) long-run performance is measured by: Buy-and-Hold Abnormal Returns, Return on Assets, Operating Margins, and Fama-French 3 and 5-factor models. Difference in results could be explained by several factors: the more exhaustive list of measurements in Buchner et al.'s study (2019), because of the difference in the chosen period, or the difference in the studied geographical area. Katz (2009) confirms Levis theory (2011) that Private Equity-backed IPOs perform better in the long-run thanks to professional ownership, tighter monitoring, and reputational considerations.

To summarize, most reviewed studies show that in general, IPOs, whether they are backed (Venture Capital and Buyout), or not, illustrate underpricing at the time they are listed, with a larger underpricing for non-backed IPOs.

H_1: Sponsored IPOs exhibit a lower underpricing than non-backed IPOs

In the long-run, results are not that clear, expressing no consensus over Venture Capital-backed IPO performance, whether they overperform or that no evidence of overperformance is expressed. Brav and Gompers (1997) found that Venture Capital-backed IPOs tended to exhibit a higher long-term performance than other IPOs while Jelic, Saadouni and Wright (2005) infirmed this. For Buyout-backed IPOs, results seem clearer on the subject with evidence that buyouts perform better in the long-run than non-sponsored IPOs.

H_2: Sponsored IPOs exhibit a higher long-term performance than non-backed IPOs

While sponsorship influence is tested through short-term and long-term performance with a decomposition of Venture Capital and Private Equity, drivers of this performance will also be tested. Accordingly, Levis (2011) found that initial return and long-term performance exhibit a negative relationship, meaning that a large underpricing leads to a lower long-term performance.
Willing to test if this theory applies on Euronext Paris and Borsa Italiana for the studied timeframe, the following hypothesis is formed:

H_3: Underpricing leads to lower long-term performance

Goergen, Khurshed and Mudambi (2007) exhibit in their study of a large sample of UK IPOs that size is a parameter of long-term performance and that a positive relationship exists between the two variables. To confirm whether size influences long-term performance or not in the studied area, the following hypothesis is tested:

H_4: Size exhibits a positive relationship with long-term performance

Stock price is used and recognized by all as an indicator of operational efficiency of a company as it reflects all available information. Krishnan et al. (2011) also looked at operational efficiency to measure whether it was reflected in the long-term performance or not. Following the same approach, the hypothesis is formed:

H_5: Operational efficiency positively influences long-term performance

Ibbotson and Jaffe (1975) expressed that timing of the offer was a parameter of performance as optimism is present in the market, which is cyclical due to macro events affecting the market, and will therefore be tested under the following hypothesis:

H_6: Hot period exhibits higher long-term performance than Cold period

Previous results show that the type of sponsors (Venture Capital, Private Equity, or no sponsor) has an impact on the stock performance of a company post-IPO. Existing literature shows that regarding the period or the geographical area of study, results differ, and some are contradictory (especially regarding Venture Capital-backed IPOs' long-run performance). The large period

spectrum covered through the literature could imply that superior abnormal returns for Buyout-backed IPOs could not be temporal and could be the effect of parameters that are not well described in previous studies (Levis, 2011; Buchner et al., 2019, described size and leverage as parameters affecting the long-term performance).

Our contribution here is clear: bring a recent, complete, and trustable study on the short- and long-term performances of French and Italian stock markets (Euronext Paris and Borsa Italiana). It will be clear insight for investors seeking companies to invest in, keeping in mind that past performance does not reflect the future.

6. Data and Methodology

This chapter outlines the research approach adopted in this study, including the type of data used to conduct the study, and the methodology applied. Brav, Gompers, and Geczy (2000) emphasized that the choice of methodology when computing returns on the IPOs' long-term performance was crucial, as results can differ significantly depending on the approach. This is in line with Fama and French (1998) model, which suggests that performance was modelized using certain parameters but cannot explain all the movements.

6.1 Data Collection

6.1.1 Data Description

To run this study, the first step was to collect data on all companies listed on Euronext Paris and Borsa Italiana (became Euronext Milano) from 2005 to 2021. This peroid was chosen to provide a recent and comprehensive dataset, excluding the dot-com bubble period while including hot and cold market phases (subprime mortgage crisis, Greek crisis, Covid-19 pandemic…).

To conduct the study, all IPO dates for the companies in the sample were collected, for the period spanning from January, the 1st of 2005 to December, the 31st of 2021 on Euronext Paris and Borsa Italiana.

Daily closing stock prices were collected for a three-year period following each IPO. In addition, firm-specific characteristics such as Market Capitalization, Revenue, EBITDA, Total Assets, and Net Debt were collected as reported at the time of the IPO, in compliance with IFRS standards.

Through Capital IQ, a sample of 706 IPOs from the selected markets and period was obtained. The data was then cleaned by removing companies with missing information (ticker, prospectus, stock prices). Financial Institutions and Real Estate companies were excluded from the sample due to the structural differences in their financial statements compared to other industries, thus could create inconsistencies in the sample. Blank-check companies were also removed from the study. Companies delisted less than three years after the IPO have also been removed as their three-year long-term performance could not have been computed. After these removals, the final sample consisted of 298 IPOs: 202 French IPOs and 178 Italian IPOs were removed due to missing data or other exclusion criteria, along with 28 other IPOs from countries not included in the scope of this study.

6.1.2 Sponsor Identification

Another important aspect is to identify the sponsors of companies going public. Private Equity funds and Venture Capital funds must be distinguished. Cao and Lerner (2009) proposed a robust method for this, which involves building an exhaustive list of investment funds (Venture Capital and Private Equity) from Capital IQ. In this study, Capital IQ will be used and cross-checked with information provided on the funds' websites and on IPO prospectuses retrieved from regulation authorities' websites (AMF for France, CONSOB for Italy), to determine whether a company is backed by a Private Equity or a Venture Capital sponsor. Then, to differentiate Venture Capital funds from Private Equity funds, an intensive review of documentation disclosed by the funds, to analyze their investment strategies (seed, Series A, Series B, growth, buyout…), will be conducted to enable proper classification.

In this study, to be characterized as sponsored, it is assumed that at least 10% of the company going public should be detained by a single Private Equity fund or Venture Capital fund. A fund must detain at least 10% of the company to be considered a sponsor.
If both a Private Equity fund (investing in late-stage companies) and a Venture Capital fund (investing in early-stage companies) are shareholders at the time of the IPO; the IPO will be classified as a Private Equity-sponsored because of the maturity of the company.

Table 1. IPO Distribution by Year and by Type of Sponsor on studied Stock Exchanges (2005-2021)

	Euronext Paris			Borsa Italiana				
Period	**VC**	**PE**	**Non-backed**	**VC**	**PE**	**Non-backed**	**Total**	*in % of Total*
2005	3	2	5	0	2	2	**14**	*4.7%*
2006	2	4	13	0	3	2	**24**	*8.1%*
2007	3	3	8	0	2	4	**20**	*6.7%*
2008	1	0	0	0	0	0	**1**	*0.3%*
2009	0	1	0	0	0	0	**1**	*0.3%*
2010	3	0	1	0	1	1	**6**	*2.0%*
2011	4	2	2	0	0	0	**8**	*2.7%*
2012	6	1	2	1	1	1	**12**	*4.0%*
2013	4	1	1	0	1	3	**10**	*3.4%*
2014	6	3	2	0	1	7	**19**	*6.4%*
2015	9	6	5	0	2	6	**28**	*9.4%*
2016	4	1	2	0	1	3	**11**	*3.7%*
2017	4	2	4	0	4	7	**21**	*7.0%*
2018	2	6	5	0	1	14	**28**	*9.4%*
2019	0	2	5	1	2	17	**27**	*9.1%*
2020	1	2	4	1	0	8	**16**	*5.4%*
2021	10	3	14	1	4	20	**52**	*17.4%*
Total	**62**	**39**	**73**	**4**	**25**	**95**	**298**	
in % of Total	*20.8%*	*13.1%*	*24.5%*	*1.3%*	*8.4%*	*31.9%*		

It is interesting to see there that it took circa five years from the subprime mortgage crisis to recover in terms of number of IPOs on Euronext Paris and Borsa Italiana. Recently, more and more companies are backed by investment funds when going public, in line with the rise of the Private Equity industry stated above.

Table 2. Ten most Active Investment Funds backing IPOs over the Studied Period (2005-2021)

Investment fund (VC / PE)	IPO backed
Bpifrance	20
Crédit Mutuel Equity	14
Eurazeo	12
Sofinnova	9
Groupe Siparex	9
A Plus Finance	8
Auriga Partners	8
Truffle Capital	7
UI Investissement	7
Seventure Partners	7
Total Top 10	**101**

This table presents the ten most represented investment funds in IPOs. Bpifrance also includes investments from CDC Entreprises as it became Bpifrance in 2012. Crédit Mutuel Equity includes CM-CIC Investissement and Banque de Vizille. Groupe Siparex includes XAnge and Rhône Alpes Création. UI Investissement includes Sofimac as it has been acquired in 2020 by UI Investissement. 118 investment funds (Venture Capital and Private Equity) were observed from 2005 to 2021 in sponsored and non-sponsored IPOs on Euronext Paris and Borsa Italiana, mostly including French investment funds as the rise of Private Equity came earlier in France than in Italy.

6.1.3 Industry Classification

To organize the dataset, companies are classified by industry following the Industry Classification Benchmark (ICB) developed by FTSE Russell and by size based on their market value at the IPO date. There are 11 types of industries regarding ICB: Technology, Telecommunications, Healthcare, Financials, Real Estate, Consumer Discretionary, Consumer Staples, Industrials, Basic Materials, Energy, and Utilities. This industry classification is the one used in Euronext, thus in this study. Financial and Real Estate companies were removed from the sample as their operational data and ratios are not the same as other industries and would bring inconsistencies in the study.

Table 3. IPO Distribution by Industry on studied Stock Exchanges (2005-2021)

Industry	Euronext Paris	Borsa Italiana	Total	*in % of Total*
Industrials	39	32	**71**	*23.8%*
Health Care	46	6	**52**	*17.4%*
Information Technology	30	21	**51**	*17.1%*
Consumer Discretionary	19	31	**50**	*16.8%*
Communication Services	16	18	**34**	*11.4%*
Materials	12	4	**16**	*5.4%*
Consumer Staples	6	7	**13**	*4.4%*
Utilities	3	5	**8**	*2.7%*
Energy	3	0	**3**	*1.0%*
Total	**174**	**124**	**298**	
in % of Total	*58.4%*	*41.6%*		

This table presents the distribution of IPOs by industry. Industry classification has been cross-checked using Capital IQ reports and the different prospectuses of the companies prior going public. It follows the FTSE Russell Industry Classification Benchmark. According to the data, industrial companies are the most represented, followed by healthcare companies and information technology companies. Healthcare companies are less represented in Borsa Italiana vs Euronext Paris.

In terms of size, IPOs were grouped into three categories, commonly agreed: small capitalization, middle capitalization, and large capitalization.

Small capitalization refers to companies with a market capitalization below €150m, middle capitalization includes companies with a market capitalization between €150m and €1bn, and large capitalization includes companies with a market capitalization above €1bn. These categories are the ones described by Euronext (compartments A, B, and C).

Table 4. IPO Distribution by size on studied Stock Exchanges (2005-2021)

	Euronext Paris			Borsa Italiana				
Period	Small (<€150m)	Mid (€150m - €1bn)	Large (>€1bn)	Small (<€150m)	Mid (€150m - €1bn)	Large (>€1bn)	Total	*in % of Total*
2005	7	1	2	2	2	0	**14**	*4.7%*
2006	14	3	2	1	4	0	**24**	*8.1%*
2007	9	3	2	1	4	1	**20**	*6.7%*
2008	1	0	0	0	0	0	**1**	*0.3%*
2009	1	0	0	0	0	0	**1**	*0.3%*
2010	3	1	0	2	0	0	**6**	*2.0%*
2011	7	1	0	0	0	0	**8**	*2.7%*
2012	8	1	0	2	1	0	**12**	*4.0%*
2013	5	0	1	3	0	1	**10**	*3.4%*
2014	9	0	2	6	1	1	**19**	*6.4%*
2015	14	4	2	4	3	1	**28**	*9.4%*
2016	5	2	0	2	1	1	**11**	*3.7%*
2017	7	1	2	10	0	1	**21**	*7.0%*
2018	12	1	0	13	2	0	**28**	*9.4%*
2019	5	1	1	18	2	0	**27**	*9.1%*
2020	6	1	0	8	0	1	**16**	*5.4%*
2021	18	6	3	21	3	1	**52**	*17.4%*
Total	**131**	**26**	**17**	**93**	**23**	**8**	**298**	
in % of Total	*44.0%*	*8.7%*	*5.7%*	*31.2%*	*7.7%*	*2.7%*		

This table shows the number of IPOs distributed across the different Euronext compartments (A, B, and C), based onthe market capitalization of the companies at the time of their listing. It can be seen from this table that the majority of the initial public offerings are small-size companies (224 companies in the sample were listed at a market capitalization lower than €150m, i.e. c.75% of the sample).

6.1.4 Benchmarks

The performance measurements presented in the underlying sections will rely on abnormal returns to assess long-term performance. Reliable benchmark is then needed for the area of study (France and Italy) to compute abnormal returns.

Benchmark selection could appear straightforward if it was to analyze a single market. Since this paper focuses on two markets, it becomes a little more sophisticated.

One option could have been to use two different benchmarks for the different markets studied, but this analysis would bring two sets of results, whereas this study aims to provide a unified analysis. In addition to that, with only 29 sponsored IPOs in Italy over the studied period included in the sample, results would have not been statistically significant enough. The choice here has been to create a proprietary benchmark, answering the needs of the study, combining indexes from both French and Italian stock markets. CAC All-Tradable has been considered for France as it combines all listed companies, from every size (small, mid and large capitalizations), avoiding any performance bias related to the size of the companies in the index. FTSE MIB index (S&P / MIB prior to 2009) has been retained for Italy as no All-Tradable index for the Italian stock market is available on Capital IQ. FTSE MIB includes the 40 largest listed companies in Italy. While this may introduce a size-related bias, it is acknowledged and accepted within the context of this study.

6.2 Methodology

6.2.1 Short-Term Performance

Short-term performance, referring to IPO underpricing or overpricing, is typically computed in two ways in the reviewed literature. Researchers have discussed two ways of analyzing IPO underpricing: raw initial returns and adjusted initial returns. Academic literature shows that both methods are accepted and provide consistent results. Adjusted prices are prices accounting for events such as dividends, stock splits or new stock offerings. Since short-term performance in this study focuses only on the first day of listing, raw initial returns will be used.

$$\text{Initial Return}_i = \frac{\text{Closing Price}_{i,t} - \text{Offering Price}_{i,t}}{\text{Offering Price}_{i,t}}$$

In addition to that, initial returns will be included as an independent variable in this study, following Levis (2011), who provided evidence that information availability, reflected in Venture Capital-backed IPOs, was a determinant of underpricing. However, in most cases, the relationship between first day returns and performance in the long-run was negative.

6.2.2 Long-Term Performance

Scholars typically rely on two main measures of long-term performance: Cumulative Abnormal Returns and Buy-and-Hold Abnormal Returns. Ritter (1991) demonstrated in his study that the method used has an impact on the result, expressing different degrees of overperformance. Using both methods to have a look at the different results and interpret them could be an option. According to Barber and Lyon (1997), Cumulative Abnormal Returns long-term performance measurement tends to generate positive bias in the analysis. Levis (2011) also followed this theory and excluded Cumulative Abnormal Returns as a long-run performance measurement in his study. Then, Buy-and-Hold Abnormal Returns (BHAR) will be the main long-run performance measurement indicator in this study. Buy-and-Hold Abnormal Returns are described by Mitchell and Stafford (2000) as "the average multiyear return from a strategy of investing in all firms that complete an event and selling at the end of a prespecified holding period". BHAR is the best performance measurement as it best replicates the effects on an investor's portfolio.

$$\text{BHAR} = \frac{1}{n}\sum_{i=1}^{n}\left[\prod_{d=1}^{d}\left(1+r_{i,d}\right) - \prod_{d=1}^{d}\left(1+r_{b,d}\right)\right]$$

Where $r_{i,d}$ is the return of a company and $r_{b,d}$ the return of a benchmark, in day d.

Buy-and-Hold Abnormal Returns are exposed to negatively generating skewness biased t-statistics regarding Barber, Tsai, and Lyon (1999) findings. To remove the hypothetical bias, a bootstrapped skewness-adjusted t-statistics test is applied, expressed hereafter:

$$t = \sqrt{n}\left(S + \frac{1}{3}\gamma S^2 + \frac{1}{6n}\gamma\right)$$

$$\text{with } S = \frac{\overline{AR}}{\sigma(AR_m)} \text{ and } \gamma = \frac{\sum_{i=1}^{n}(AR_{i,m} - \overline{AR_m})^3}{n\sigma(AR_m)^3}$$

where n is the number of companies, AR_m the abnormal return in month m, and γ a skewness estimate.

6.2.3 Independent Variables and Dummy Variables

According to Verbeek (2012), to conduct a meaningful empirical study, independent variables should (i) be of interest to the author, (ii) align with economic theory, and (iii) make intuitive sense.

Several variables will be used in this research to conduct the study. Daily closing stock prices were collected for the three-year analysis period from the IPO date and firm-specific characteristics such as Market Capitalization, Revenue, EBITDA, Total Assets, and Net Debt were collected at the time of the IPO following IFRS standards.

As seen in the literature review, significant numerical parameters of the difference between Private Equity and Venture Capital targets are size and leverage. There are two ways of interpreting the size of a company. It could be through its market capitalization, following Ritter's paper (1991), or through total assets, respecting Goergen et al. (2007). A clear bias in considering market capitalization as a size indicator is observed, as market capitalization is the resultant of market perception. For example, a promising technology company could have a higher market capitalization than it currently represents. Then, in this paper, *total assets* will be the size indicator. It will be transformed further, according to Levis (2011), into natural logarithm to better capture the variation in percentage and thus limit the impact of extremely high or low values.

Leverage is also a Private Equity industry-specific criteria as funds operate through leverage to acquire their targets. Venture Capitalists, on their side, help managers to drive their cash balance and be aware of the debt sizing. The Leverage independent variable will be *Net Debt / EBITDA* as it expresses the required length of a company to pay back its debt if metrics are held constant.

To control operational characteristics, consistently with Levis (2011), two other metrics are added to the study: *Asset Turnover* and *EBITDA Margin*. *Asset Turnover* is an efficiency ratio, expressing the ability that has a company to generate revenue through its assets. It is represented by the formula Revenue / Total Assets. *EBITDA Margin* is a ratio that indicates operational profit of a company in percentage of its revenue. It is represented by the formula EBITDA / Revenue.

Price-to-Book ratio has also been used in many studies to differentiate value and growth stocks. As it always appeared as a non-significant parameter of IPO performance, this ratio has been excluded from the study.

Initial Return will also be considered as an explanatory variable. Ritter (1991) showed that high first-day returns often correlate negatively with long-term performance, as information availability increases with time after the IPO.

Table 5. Summary Statistics for Private Equity-backed companies (2005-2021)

	Private Equity-backed companies (64 observations)				
Period: 2005-2021	**Mean**	**Median**	**Standard deviation**	**Min**	**Max**
Market Capitalization (€k)	1,135,222.3	156,124.0	2,944,503.0	4,182.4	22,445,000.0
Revenue (€k)	763,471.7	60,647.5	1,726,938.1	-	10,665,500.0
EBITDA (€k)	98,049.9	10,526.2	169,390.3	(7,000.0)	661,100.0
Total Assets (€k)	822,818.4	100,431.5	1,486,575.2	1,479.8	5,893,100.0
Net Debt (€k)	354,709.2	13,391.5	837,301.1	(124,063.0)	3,901,000.0
Log (Total Assets)	5.0	5.0	1.0	3.2	6.8
Asset Turnover	1.0	0.9	0.6	-	3.3
EBITDA Margin (in % of Revenue)	4.3%	14.3%	1.0	(800.0%)	77.1%
Leverage	-20.7x	1.5x	181.6	-1,448.3x	67.5x

This table presents the summary statistics for Private Equity-backed companies, including mean, median, standard deviation, minimum, maximum, and number of observations for the studied period.

Table 6. Summary Statistics for Venture Capital-backed companies (2005-2021)

	Venture Capital-backed companies (66 observations)				
Period: 2005-2021	**Mean**	**Median**	**Standard deviation**	**Min**	**Max**
Market Capitalization (€k)	128,514.5	59,821.6	249,559.4	9,900.0	1,900,000.0
Revenue (€k)	23,068.7	3,256.0	69,995.7	-	441,400.0
EBITDA (€k)	(1,884.1)	(1,848.5)	5,177.6	(12,594.0)	15,531.0
Total Assets (€k)	32,752.0	11,340.5	86,553.9	386.0	660,000.0
Net Debt (€k)	1,674.0	1,125.5	14,563.3	(32,788.0)	87,922.0
Log (Total Assets)	4.1	4.1	0.6	2.6	5.8
Asset Turnover	0.5	0.4	0.5	-	2.6
EBITDA Margin (in % of Revenue)	(1091.9%)	(69.6%)	42.6	(32471.4%)	78.4%
Leverage	-19.3x	0.0x	151.2	-1,236.3x	17.9x

This table presents the summary statistics for Venture Capital-backed companies, including mean, median, standard deviation, minimum, maximum, and number of observations for the studied period.

Table 7. Summary Statistics for non-backed companies (2005-2021)

	Non-backed companies (168 observations)				
Period: 2005-2021	**Mean**	**Median**	**Standard deviation**	**Min**	**Max**
Market Capitalization (€k)	232,352.0	42,996.1	1,039,646.6	6,780.0	12,870,000.0
Revenue (€k)	124,850.2	18,452.5	612,885.3	-	7,565,400.0
EBITDA (€k)	18,037.3	2,017.0	76,508.2	(14,875.0)	712,700.0
Total Assets (€k)	243,322.7	18,005.0	1,524,906.3	170.9	18,508,600.0
Net Debt (€k)	107,166.5	2,274.8	995,687.4	(45,311.0)	12,754,100.0
Log (Total Assets)	4.3	4.3	0.8	2.2	7.3
Asset Turnover	1.4	0.9	2.3	-	23.9
EBITDA Margin (in % of Revenue)	(66.5%)	11.5%	8.3	(10600.9%)	44.1%
Leverage	2.2x	0.9x	10.3	-35.4x	76.4x

This table presents the summary statistics for non-backed companies, including mean, median, standard deviation, minimum, maximum, and number of observations for the studied period.

Table 8. Summary Statistics for all companies (2005-2021)

	All companies (298 observations)				
Period: 2005-2021	**Mean**	**Median**	**Standard deviation**	**Min**	**Max**
Market Capitalization (€k)	403,259.5	52,200.0	1,622,782.9	4,182.4	22,445,000.0
Revenue (€k)	239,461.6	15,403.2	964,413.7	-	10,665,500.0
EBITDA (€k)	30,809.1	1,677.7	103,768.4	(14,875.0)	712,700.0
Total Assets (€k)	321,141.7	17,707.5	1,364,948.8	170.9	18,508,600.0
Net Debt (€k)	136,965.9	2,355.5	851,032.5	(124,063.0)	12,754,100.0
Log (Total Assets)	4.4	4.2	0.9	2.2	7.3
Asset Turnover	1.1	0.8	1.8	-	23.9
EBITDA Margin (in % of Revenue)	(267.5%)	9.5%	21.0	(32471.4%)	78.4%
Leverage	-7.5x	0.8x	110.9	-1,448.3x	76.4x

This table presents the summary statistics for all the companies, including mean, median, standard deviation, minimum, maximum, and number of observations for the studied period.
The four previous tables present the summary statistics of the different studied groups, including Market Capitalization, Revenue, EBITDA, Total Assets, Net Debt, Log(Total Assets), Asset Turnover, EBITDA Margin, and Leverage. From these tables, if mean and median figures are considered, it can be expressed that Private Equity-backed IPOs are larger than Venture Capital and non-backed IPOs (market capitalization, revenue, and total assets). Looking at median figures, Private Equity-backed companies also show a higher leverage than other companies due to their operating functioning (buyout with a considerable amount of debt). Same applies to the EBITDA Margin, Private Equity-sponsored IPO are more mature companies with proved operational efficiency. Mean metrics are not considered because of outliners. For Venture Capital-sponsored IPOs, revenue and EBITDA are lower than other IPOs because Venture Capitalists try to find the next rising star, in a riskier way with earlier-stage companies, leading to lower financial metrics (biotechnologies are often backed by venture capital healthcare funds and go public without any revenue in most cases). Leverage for Venture Capital-backed companies is lower as investors are concerned with the cash burn and do not respect, in most cases, the conditions to have access to financial debt (negative or very limited EBITDA).

Dummy variables are added as switches for each regression model. In this study, data is divided into three groups: non-backed IPOs, Private Equity-backed IPOs, and Venture Capital-backed IPOs.

A Crisis dummy is also implemented, as per Levis (2011) dot-com bubble dummy. 2007 was the year of the financial break with 17% of US households facing failure to repay their

mortgage. A difficulty here was to identify the correct period to be considered for the analysis. A dummy that takes the value of 1 has been introduced for IPOs in 2007, 2008, and 2009 (subprime mortgage crisis), as well as in 2020 (Covid-19 pandemic) and 0 otherwise.

6.3 Model Considerations

The method applied in this research is based on the Ordinary Least Squares (OLS) method. OLS regression is a widely used statistical technique that minimize the sum of squared differences between observed and expected abnormal returns from a set of explanatory variables in a linear regression model. The model used in this study is:

$$y_i = \beta_0 + \beta X + \varepsilon_i$$

where y represents the dependent variable, specifically the Buy-and-Hold Abnormal Returns and X is the matrix of independent variables introduced earlier in this paper.

Multivariate regression analyses are run to identify long-run performance drivers and differences between Private Equity-backed, Venture Capital-backed, and non-backed IPOs. In this paper, two regression stages are used. At the beginning, a linear regression is done to focus on firm specific characteristics, meaning on first day returns, on the size of the company, and on leverage.

$$BHAR = \beta_0 + \beta_1 Initial\ Return + \beta_2 \log(Total\ Assets) + \beta_3 Leverage + \beta_4 Sponsored + \beta_5 Crisis + \varepsilon \quad (1)$$

$$BHAR = \beta_0 + \beta_1 Initial\ Return + \beta_2 \log(Total\ Assets) + \beta_3 Leverage + \beta_4 PE + \beta_5 VC + \beta_6 Crisis + \varepsilon \quad (2)$$

After these two regressions, two criteria are added to the model to study if operational factors such as *Asset Turnover* and *EBITDA margin* are long-run performance drivers. Other variables remain unchanged.

$$BHAR = \beta_0 + \beta_1 Initial\ Return + \beta_2 \log(Total\ Assets) + \beta_3 Leverage + \beta_4 Asset\ Turnover + \beta_5 EBITDA\ Margin + \beta_6 Sponsored + \beta_7 Crisis + \varepsilon \quad (3)$$

$$BHAR = \beta_0 + \beta_1 Initial\ Return + \beta_2 \log(Total\ Assets) + \beta_3 Leverage + \beta_4 Asset\ Turnover + \beta_5 EBITDA\ Margin + \beta_6 PE + \beta_7 VC + \beta_8 Crisis + \varepsilon \quad (4)$$

Before running the regressions, 6 assumptions for linear regressions must be verified:

i) Independent variables and dependent variables exhibit a linear relationship
ii) Independent variables are not random
iii) On average estimation error is zero
iv) Error term has a constant and finite variance over time (homoskedasticity)
v) Error terms are uncorrelated across observations
vi) Error term is normally distributed

Table 9. Diagnostic tests for linear regression assumptions

Assumption	Test performed
Homoskedasticty	Breusch-Pagan test
No autocorrelation of residuals	Breusch-Godfrey test
Residuals normally distributed	Jarque-Bera test
No multicollinearity	Variance inflation factor test

All tests and linear regressions are achieved on Python.

6.4 Limits of the Study

6.4.1 Selected Benchmark

The choice of the benchmark is quite a crucial aspect when calculating Buy-and-Hold Abnormal Returns. As the return of the selected benchmark directly impacts on the results of the Buy-and-Hold Abnormal Returns, its choice is perilous as the dependent variable could vary.

In this study, a proprietary benchmark has been constructed to answer the needs of the analysis. It combines the rebased CAC All-Tradable and FTSE MIB indexes that are the most relevant indexes to run this analysis in France and Italy. The aim of a rebased combined benchmark is to get rid of the value bias of the indexes (CAC All-Tradable traded at 5,755pts as of May 11, 2025, and FTSE MIB traded at 39,369pts as of May 11, 2025). A limitation is the nature of the FTSE MIB index, which gathers the forty largest listed companies in Italy, thus potentially reflecting a size bias in the study.

Thus, the best option could have been to select more benchmarks and to run different analyses, for both France and Italy, or using different benchmarks, such as size-adjusted benchmarks, industry-adjusted benchmarks, or country-based benchmarks.

6.4.2 Significance of Data

Prior to regressions, two computations are done, for short-term performance and long-term performance, meaning First-Day Returns and Buy-and-Hold Abnormal Returns. Three-year Buy-and-Hold Abnormal Returns is the dependent variable while First-Day Returns is an independent variable.

The statistical significance of Buy-and-Hold Abnormal Returns is assessed using bootstrapped skewness-adjusted t-test, following the methodology of Lyon, Barber, and Tsai (1999), while significance of First-Day Returns is tested through standard t-test. Median tests are also conducted to complement the analysis. Then, to ensure clear results in the regression, variables included in the regression must show statistical significance. A lack of significance in the dependent or independent variable could come from possible bias such as insufficient sample size, that limit the statistical power of the results.

7. Empirical Results

In the following section, the empirical results are presented. Both short-term performance and long-term performance are respectively measured through initial return and buy-and-hold abnormal returns for all the studied groups (Private Equity-backed, Venture Capital-backed, and non-sponsored companies). To assess the statistical significance of the observed differences, both T-tests and Wilcoxon signed rank tests have been performed. In addition, linear regressions have been conducted to in-depth analyze the drivers of long-term IPO performance.

7.1 Short-Term Performance

7.1.1 Underpricing Analysis by Year

Table 10. Full Sample Underpricing per Year (2005-2021)

	Consolidated		
	Mean	**Median**	**Observations**
2005	-0.7%	-0.6%	14
2006	+5.0% **	+4.2% ***	24
2007	+6.5% **	+3.1% ***	20
2008	-41.7%	-41.7%	1
2009	-1.3%	-1.3%	1
2010	+3.3%	+4.5%	6
2011	+22.1%	+1.2%	8
2012	-3.1%	-1.3%	12
2013	+6.6%	+2.3%	10
2014	+3.9%	+1.4% *	19
2015	+3.4% *	-	28
2016	+2.7%	+1.9%	11
2017	+4.5% *	+0.9% *	21
2018	+4.6% *	+1.3% **	28
2019	+11.5% **	+4.1% ***	27
2020	+5.3%	+0.6%	16
2021	+10.4% ***	+4.3% ***	52
Total	**+6.0%*** **	**+1.2% *** **	**298**

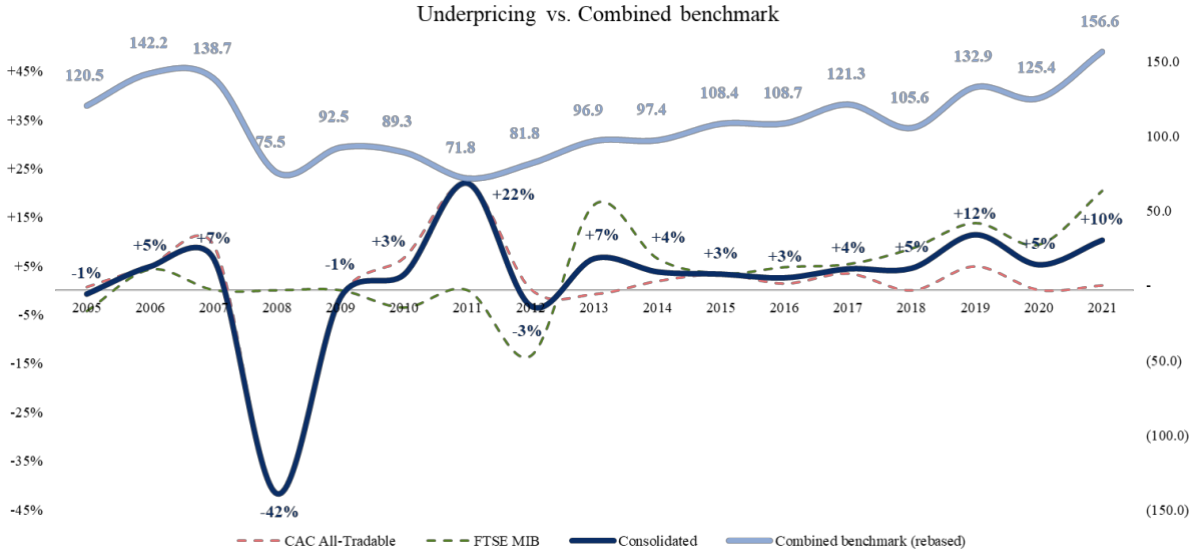
This table presents IPO underpricing accross the sample of 298 IPOs listed on Euronext Paris and Borsa Italiana over the 2005-2021 period. Underpricing refers to returns on the first trading day and is computed as the percentage difference between the first closing price and the offering price. Returns are non-adjusted. T-tests have been done to test the significance of the mean and Wilcoxon signed rank test have been done to test the significance of the median. An asterisk refers to significance at the 10% level; two asterisks at the 5% level; three asterisks at the 1% level.

Confirming existing literature and past research, a positive average IPO underpricing is found throughout the studied period with a mean of 6.0%, which is statistically significant at the 1% level. This finding is lower than the results of Goergen et al. (2003) that found an average underpricing of 10.36% in Belgium for all IPOs between 1996 and 2000. This result is also lower from research that has been conducted by Derrien and Womack (2003) and from Ljungqvist et al. (2003). Derrien and Womack (2003) found evidence of underpricing for all IPOs between 1983 and 2000 in France with an average underpricing at 11.6%. Ljungqvist et al. (2003) found an average underpricing of 10.2% in the Netherlands for the period 1982 to 1999. These results in France and other European countries are slightly different from the studied period for three possible reasons: i) previous studies incorporated the dot-com bubble effect before it crashed with valuations soaring; ii) different country analysis could lead to less underpricing as some other countries, even though they are geographically close; (iii) the rise of Private Equity is recent, and it has been seen in literature review that Private Equity-backed companies show less underpricing than non-backed companies due to lower risk, more aggressive pricing and group certification following Levis (2011). As the sample studied is composed of more Private-Equity backed companies than other studies due to the temporality of this study, it could be an explanation of lower underpricing.

As shown in Table 10 underpricing fluctuates across years, so it may be interesting to map them against the constructed benchmark, here a combination of CAC All-Tradable and FTSE MIB indexes.

Following the introduced dummy Crisis, five different periods have been identified in this study: three “Hot” periods, from 2005 to 2007, 2010 to 2020 and in 2021, as well as two “Cold” periods, from 2007 to 2009 and in 2020. To look at the cyclicality, the following graph Figure 1 expresses the Underpricing versus the cumulated returns of the proprietary benchmark over time (rebased as of 01/01/2005).

Figure 1. Underpricing (yearly average) vs. combined benchmark (as of 31/12 - 2005-2021)



The sample contains 298 companies that went public from 2005 to 2021 on Euronext Paris and Borsa Italiana (which became Euronext Milano). Yearly underpricing is reflected by its mean while combined benchmark is displayed with year-end annual returns.

It can be seen from Figure 1 that a high yearly average underpricing leads to an increase in year-end combined benchmark annual returns, and a decrease in underpricing leads to a decrease in year-end combined benchmark annual returns. This scenario seems to be verified all along the studied period, except in 2011 with an exceptional 22% underpricing on average over 8 IPOs. Levels of underpricing for 2011 are very different than other years because they have been driven by two IPOs that soared on their first trading day: Biosynex SA (136% underpricing) and Global Bioenergies SA (41% underpricing). If the median is considered, it falls to an underpricing level of 1.2% for 2011.

If the sample is divided into "Hot" and "Cold" periods as seen above, the mean underpricing for the "Hot" period is 6.2% and the mean underpricing for the "Cold" period is 4.6%. Both underpricing results are statistically significant, respectively at the 1% and 10% levels. This confirms the results of Levis (2011) talking about the cyclicality in underpricing with "Hot" period showing higher underpricing than "Cold" period.

7.1.2 Underpricing Analysis Across IPO Types

Previous studies have already been conducted on the impact of IPO sponsorship on underpricing over time such as Megginson and Weiss (1991), Hogan, Olson, and Kish (2001), Buchner et al. (2019) or Levis (2011). These studies do not cover the selected period (2005-2021) at the exception of Buchner et al. (2019) that studied US IPOs from 2000 to 2014, covering a portion of our studied period. Plus, these studies do not cover the chosen area of research, meaning the combination of France and Italy.

Following Ghosh and Ejara (2004), a lower underpricing level is expected as France and Italy are developed countries. Results will be presented over several characteristics, including mean, median, standard deviation, minimum, maximum and number of observations to have a clearer view on the results. The IPO cyclicality will also be presented to see if there is any difference between "Hot" periods, meaning from 2005 to 2007, 2010 to 2020 and 2021, and a "Cold" period, from 2007 to 2009, and in 2020. The entire period is also displayed.

Table 11. Underpricing across the different IPO types (2005-2021)

Underpricing	Private Equity	Venture Capital	Non-backed	Sponsored	All
Entire period (2005-2021)					
Average	+1.2% (p=0.407)	+2.6% (p=0.140)	+9.1% *** (p=0.000)	+1.9% * (p=0.092)	+6.0% *** (p=0.000)
Median	0.0% * (p=0.061)	+0.1% (p=0.105)	+3.2% *** (p=0.000)	0.0% ** (p=0.015)	+1.2% *** (p=0.000)
Standard deviation	11.3%	14.4%	21.6%	12.9%	18.6%
Min	-43.2%	-46.8%	-30.7%	-46.8%	-46.8%
Max	+46.8%	+44.0%	+136.2%	+46.8%	+136.2%
Observations	64	66	168	130	298
Hot period #1 (2005-2006)					
Average	+3.4% * (p=0.075)	+1.5% (p=0.369)	+2.9% (p=0.194)	+2.8% ** (p=0.042)	+2.9% ** (p=0.040)
Median	+3.5% (p=0.123)	+0.2% (p=0.465)	+1.0% (p=0.167)	+0.4% * (p=0.100)	+0.8% ** (p=0.024)
Standard deviation	5.7%	3.3%	10.3%	5.1%	8.4%
Min	-2.7%	-0.6%	-10.5%	-2.7%	-10.5%
Max	+17.6%	+7.3%	+44.0%	+17.6%	+44.0%
Observations	11	5	22	16	38
Cold period #1 (2007-2009)					
Average	+2.9% (p=0.228)	+7.2% (p=0.717)	+3.5% (p=0.138)	+4.6% (p=0.513)	+4.0% (p=0.227)
Median	+0.6% (p=0.345)	+13.3% (p=0.625)	+1.4% (p=0.203)	+3.2% (p=0.214)	+1.5% * (p=0.053)
Standard deviation	5.1%	36.3%	7.6%	21.4%	15.0%
Min	-1.3%	-41.7%	-4.6%	-41.7%	-41.7%
Max	+11.5%	+44.0%	+21.1%	+44.0%	+44.0%
Observations	6	4	12	10	22
Hot period #2 (2010-2019)					
Average	+0.7% (p=0.701)	+3.5% (p=0.106)	+8.8% *** (p=0.000)	+2.2% (p=0.127)	+5.6% *** (p=0.000)
Median	- (p=0.316)	+0.2% * (p=0.081)	+2.9% *** (p=0.000)	0.0% ** (p=0.049)	+1.2% *** (p=0.000)
Standard deviation	11.9%	14.0%	21.9%	13.1%	18.4%
Min	-43.2%	-46.8%	-30.7%	-46.8%	-46.8%
Max	+46.8%	+40.8%	+136.2%	+46.8%	+136.2%
Observations	38	44	88	82	170
Cold period #2 (2020)					
Average	+0.5% (p=0.918)	+0.1% (p=0.500)	+7.0% (p=0.152)	+0.3% (p=0.869)	+5.3% (p=0.147)
Median	+0.5% (p=1.000)	+0.1% (p=0.317)	+2.3% (p=0.182)	+0.1% (p=0.593)	+0.6% (p=0.198)
Standard deviation	5.0%	0.1%	15.8%	2.9%	13.9%
Min	-3.1%	-	-19.9%	-3.1%	-19.9%
Max	+4.0%	+0.1%	+27.6%	+4.0%	+27.6%
Observations	2	2	12	4	16
Hot period #3 (2021)					
Average	-1.2% (p=0.871)	-1.4% (p=0.562)	+16.6% *** (p=0.002)	-1.4% (p=0.662)	+10.4% *** (p=0.006)
Median	+4.6% (p=1.000)	-1.3% (p=0.508)	+6.9% *** (p=0.001)	-0.5% (p=0.795)	+4.3% *** (p=0.005)
Standard deviation	19.3%	8.0%	28.8%	13.0%	25.8%
Min	-31.8%	-17.7%	-28.0%	-31.8%	-31.8%
Max	+19.0%	+11.3%	+125.0%	+19.0%	+125.0%
Observations	7	11	34	18	52

Underpricing	Private Equity	Venture Capital	Non-backed	Sponsored	All
Total Hot periods					
Average	+1.0% (p=0.524)	+2.4% (p=0.142)	+9.8% *** (p=0.000)	+1.7% (p=0.127)	+6.2% *** (p=0.000)
Median	- (p=0.107)	+0.1% (p=0.158)	+3.4% *** (p=0.000)	0.0% ** (p=0.035)	+1.3% *** (p=0.000)
Standard deviation	12.0%	12.6%	22.7%	12.3%	19.2%
Min	-43.2%	-46.8%	-30.7%	-46.8%	-46.8%
Max	+46.8%	+40.8%	+136.2%	+46.8%	+136.2%
Observations	56	60	144	116	260
Total Cold periods					
Average	+2.3% (p=0.228)	+4.8% (p=0.694)	+5.3% ** (p=0.047)	+3.4% (p=0.496)	+4.6% * (p=0.059)
Median	+0.6% (p=0.310)	+2.7% (p=0.345)	+1.5% * (p=0.085)	+0.6% (p=0.182)	+1.1% ** (p=0.030)
Standard deviation	4.8%	28.3%	12.3%	18.0%	14.4%
Min	-3.1%	-41.7%	-19.9%	-41.7%	-41.7%
Max	+11.5%	+44.0%	+27.6%	+44.0%	+44.0%
Observations	8	6	24	14	38

This table presents the average underpricing of the different sponsorship possibilities meaning Private Equity-backed, Venture Capital-backed, more broadly Sponsored Companies (Private Equity-backed or Venture Capital-backed), non-backed companies and then all companies. Median, standard deviation, minimum, maximum, and number of observations are also displayed. This table is divided into eight segments: the entire period (2005-2021), the "Hot period #1" from 2005 to 2007, a "Cold period #1" from 2007 to 2009, a "Hot period #2" from 2010 to 2020, a "Cold period #2" in 2020, a "Hot period #3" in 2021, a "Total Hot periods" segment and a "Total Cold periods" segment. T-tests for mean analysis have been conducted and results are expressed in parentheses. Wilcoxon signed rank tests have also been conducted for median analysis. An asterisk represents the significance at the 10% level; two asterisks represent the significance at the 5% level; three asterisks represent the significance at the 1% level.

Confirming existing literature, this study shows evidence of statistically significant results of different underpricing levels regarding the nature of the sponsor, with a statistically significant 1.9% underpricing for sponsored companies (Venture Capital-backed and Private Equity-backed companies) and a 9.1% underpricing for non-backed companies.

Megginson and Weiss (1991) studied 640 IPOs from 1983 to 1987 where Venture Capital-backed IPOs showed a mean initial return at 7.1% and non-backed IPOs showed a mean initial return at 11.9%. It is expressed that Venture Capitalists tend to demonstrate the true value of the company to investors and that *in fine* reduce underpricing of Venture Capital-backed companies. Megginson and Weiss (1991) results are not statistically significant with a 2.6% underpricing for Venture Capital-backed companies while non-backed companies express a

statistically significant 9.1% underpricing at the 1% level. Hogan, Olson, and Kish (2001) studied IPOs from 1987 to 1998 and found evidence of lower underpricing for Private Equity-backed companies at 7.64% against 13% for non-backed companies. Results are not statistically significant with a 1.2% underpricing for Private Equity-backed companies against a statistically significant at the 1% level 9.1% underpricing for non-backed companies. Buchner et al. (2019) and Levis (2011) did a comparison of underpricing between Venture Capital-backed and Private Equity-backed companies, and both found matching results. Buchner et al. (2019) studied US IPOs from 2000 to 2014 and found underpricing for Private Equity-backed companies at 10.7% and at 18.9% for Venture Capital-backed companies. Levis (2011) studied sponsored-backed IPOs in the UK from 1992 to 2005 and found underpricing levels at 5.7% for Private Equity-backed companies and at 8.5% for Venture Capital-backed companies.

The results of this study do not allow us to confirm the findings of previous research regarding the differences between Private Equity-backed and Venture Capital-backed IPOs, as the results for both groups are not statistically significant over the 2005–2021 period on Euronext Paris and Borsa Italiana.

When it comes to cyclicality, in line with Levis (2011), some significant differences are observed between Hot and Cold market periods. Non-backed IPOs show statistically significant higher underpricing in Hot periods (average of 9.8%, significant at the 1% level) compared to Cold periods (average of 5.3%, significant at the 5% level). This confirms the existence of IPO underpricing cyclicality, with higher underpricing occurring in more favorable market conditions.

Looking at the broader category of Sponsored IPOs (i.e., both PE- and VC-backed), we find a statistically significant lower level of underpricing for the entire period, with an average of 1.9%, compared to 9.1% for non-backed companies. Although differences during Hot periods (1.7%) and Cold periods (3.4%) are not statistically significant, the contrast over the full sample is.

These results support hypothesis H_1, indicating that sponsored IPOs (Venture Capital and Private Equity) exhibit a lower underpricing than non-backed IPOs. This is then consistent with the existing literature on certification and reduced information asymmetry.

7.2 Long-Term Performance

Results of long-term performance are displayed with regards to previous literature, meaning using the Buy-and-Hold Abnormal Returns method, for Year 1, Year 2, and Year 3.

Table 12. IPO long-term performance by nature of sponsor at Year1 (2005-2021)

BHAR 1Y	**Private Equity**	**Venture Capital**	**Non-backed**	**Sponsored**	**All**
Entire period (2005-2021)					
Average	-13.1% *** (p=0.001)	-6.8% (p=0.537)	-4.2% (p=0.284)	-9.9% * (p=0.094)	-6.7% ** (p=0.048)
Median	-18.9% *** (p=0.001)	-18.7% *** (p=0.000)	-11.0% *** (p=0.002)	-18.8% *** (p=0.000)	-15.9% *** (p=0.000)
Standard deviation	30.8%	88.8%	50.3%	66.7%	58.0%
Min	-76.8%	-83.8%	-78.6%	-83.8%	-83.8%
Max	+56.0%	+643.8%	+300.6%	+643.8%	+643.8%
Observations	64	66	168	130	298
Hot period #1 (2005-2006)					
Average	-13.0% (p=0.176)	-4.3% (p=0.607)	+2.7% (p=0.700)	-10.3% (p=0.136)	-2.8% (p=0.573)
Median	-21.5% (p=0.240)	-6.9% (p=0.812)	-3.1% (p=0.975)	-12.6% (p=0.193)	-7.8% (p=0.357)
Standard deviation	29.6%	17.1%	32.1%	26.0%	30.0%
Min	-51.8%	-24.0%	-40.8%	-51.8%	-51.8%
Max	+40.3%	+16.6%	+74.8%	+40.3%	+74.8%
Observations	11	5	22	16	38
Cold period #1 (2007-2009)					
Average	+4.3% (p=0.705)	-21.5% (p=0.116)	-32.7% *** (p=0.003)	-6.0% (p=0.489)	-20.6% *** (p=0.005)
Median	+3.5% (p=0.844)	-16.6% (p=0.125)	-45.5% *** (p=0.007)	-9.9% (p=0.432)	-19.5% *** (p=0.005)
Standard deviation	26.4%	19.6%	29.1%	26.3%	30.4%
Min	-24.7%	-49.4%	-68.5%	-49.4%	-68.5%
Max	+43.6%	-3.5%	+19.0%	+43.6%	+43.6%
Observations	6	4	12	10	22
Hot period #2 (2010-2019)					
Average	-11.8% ** (p=0.024)	-3.6% (p=0.822)	-8.8% * (p=0.056)	-7.4% (p=0.405)	-8.1% * (p=0.096)
Median	-16.8% ** (p=0.015)	-21.6% *** (p=0.002)	-17.1% *** (p=0.003)	-19.6% *** (p=0.000)	-18.0% *** (p=0.000)
Standard deviation	31.0%	106.0%	42.3%	80.1%	63.2%
Min	-76.8%	-77.6%	-77.9%	-77.6%	-77.9%
Max	+56.0%	+643.8%	+228.4%	+643.8%	+643.8%
Observations	38	44	88	82	170
Cold period #2 (2020)					
Average	-31.2% (p=0.572)	-26.6% (p=0.334)	+27.7% (p=0.107)	-28.9% (p=0.193)	+13.6% (p=0.343)
Median	-31.2% (p=1.000)	-26.6% (p=0.500)	+9.4% (p=0.151)	-26.6% (p=0.250)	+4.0% (p=0.464)
Standard deviation	55.5%	21.8%	54.7%	34.6%	55.4%
Min	-70.5%	-42.0%	-50.2%	-70.5%	-70.5%
Max	+8.0%	-11.2%	+126.8%	+8.0%	+126.8%
Observations	2	2	12	4	16

BHAR 1Y	**Private Equity**	**Venture Capital**	**Non-backed**	**Sponsored**	**All**
Hot period #3 (2021)					
Average	-29.8% ** (p=0.026)	-11.6% (p=0.454)	+2.1% (p=0.870)	-18.7% * (p=0.078)	-5.1% (p=0.570)
Median	-33.3% ** (p=0.047)	-28.6% (p=0.465)	-8.4% (p=0.196)	-30.9% * (p=0.067)	-15.9% ** (p=0.035)
Standard deviation	27.0%	49.6%	73.3%	42.3%	64.6%
Min	-73.1%	-83.8%	-78.6%	-83.8%	-83.8%
Max	+6.2%	+69.4%	+300.6%	+69.4%	+300.6%
Observations	7	11	34	18	52
Total Hot periods					
Average	-14.3% *** (p=0.001)	-5.1% (p=0.670)	-4.5% (p=0.288)	-9.6% (p=0.144)	-6.7% * (p=0.070)
Median	-20.6% *** (p=0.001)	-20.4% *** (p=0.002)	-11.9% *** (p=0.002)	-20.6% *** (p=0.000)	-16.8% *** (p=0.000)
Standard deviation	30.3%	92.9%	50.1%	69.9%	59.7%
Min	-76.8%	-83.8%	-78.6%	-83.8%	-83.8%
Max	+56.0%	+643.8%	+300.6%	+643.8%	+643.8%
Observations	56	60	144	116	260
Total Cold periods					
Average	-4.6% (p=0.722)	-23.2% ** (p=0.026)	-2.5% (p=0.820)	-12.6% (p=0.135)	-6.2% (p=0.406)
Median	+2.2% (p=0.945)	-16.6% ** (p=0.031)	-7.3% (p=0.623)	-13.7% (p=0.135)	-10.7% (p=0.170)
Standard deviation	34.8%	18.2%	52.8%	29.5%	45.4%
Min	-70.5%	-49.4%	-68.5%	-70.5%	-70.5%
Max	+43.6%	-3.5%	+126.8%	+43.6%	+126.8%
Observations	8	6	24	14	38

This table presents the Buy-and-Hold Abnormal Returns for the first year after IPO. Mean, median, standard deviation, minimum and maximum are broken down into eight segments: the entire period (2005-2021), the "Hot period #1" from 2005 to 2007, a "Cold period #1" from 2007 to 2009, a "Hot period #2" from 2010 to 2020, a "Cold period #2" in 2020, a "Hot period #3" in 2021, a "Total Hot periods" segment and a "Total Cold periods" segment. Bootstrapped skewness-adjusted t-tests have been conducted for mean analysis, with results under parentheses. Wilcoxon signed rank tests have been conducted for median analysis and significance levels are expressed by the asterisks: one asterisk means significance level at the 10%, two asterisks mean significance level at the 5%, and three asterisks mean significance level at the 1%.

Table 13. IPO long-term performance by nature of sponsor at Year2 (2005-2021)

BHAR 2Y	**Private Equity**	**Venture Capital**	**Non-backed**	**Sponsored**	**All**
Entire period (2005-2021)					
Average	-21.8% *** (p=0.000)	-23.6% *** (p=0.009)	-10.6% ** (p=0.041)	-22.7% *** (p=0.000)	-15.9% *** (p=0.000)
Median	-29.1% *** (p=0.000)	-37.4% *** (p=0.000)	-21.6% *** (p=0.000)	-32.9% *** (p=0.000)	-25.0% *** (p=0.000)
Standard deviation	46.7%	70.7%	67.0%	59.9%	64.2%
Min	-93.6%	-95.9%	-95.4%	-95.9%	-95.9%
Max	+137.8%	+432.7%	+404.2%	+432.7%	+432.7%
Observations	64	66	168	130	298
Hot period #1 (2005-2006)					
Average	-28.8% ** (p=0.040)	-17.7% (p=0.294)	-4.4% (p=0.568)	-25.4% ** (p=0.016)	-13.2% ** (p=0.035)
Median	-38.2% * (p=0.054)	-21.6% (p=0.312)	-7.7% (p=0.588)	-35.0% ** (p=0.021)	-14.9% ** (p=0.041)
Standard deviation	40.5%	32.9%	35.4%	37.6%	37.3%
Min	-72.0%	-52.3%	-60.3%	-72.0%	-72.0%
Max	+51.8%	+33.3%	+68.9%	+51.8%	+68.9%
Observations	11	5	22	16	38
Cold period #1 (2007-2009)					
Average	+5.7% (p=0.855)	-29.3% * (p=0.053)	-35.4% *** (p=0.006)	-8.3% (p=0.662)	-23.1% ** (p=0.036)
Median	-16.1% (p=0.844)	-23.7% (p=0.125)	-37.8% *** (p=0.007)	-23.7% (p=0.275)	-27.6% *** (p=0.006)
Standard deviation	72.6%	18.8%	36.6%	58.0%	48.3%
Min	-64.2%	-56.3%	-80.5%	-64.2%	-80.5%
Max	+137.8%	-13.3%	+17.6%	+137.8%	+137.8%
Observations	6	4	12	10	22
Hot period #2 (2010-2019)					
Average	-17.3% ** (p=0.022)	-19.5% (p=0.127)	-9.0% (p=0.186)	-18.5% ** (p=0.016)	-13.6% *** (p=0.008)
Median	-25% ** (p=0.014)	-37.4% *** (p=0.000)	-19.2% *** (p=0.003)	-29.8% *** (p=0.000)	-23.6% *** (p=0.000)
Standard deviation	44.3%	83.3%	63.8%	67.7%	65.7%
Min	-84.7%	-95.9%	-95.4%	-95.9%	-95.9%
Max	+110.9%	+432.7%	+234.3%	+432.7%	+432.7%
Observations	38	44	88	82	170
Cold period #2 (2020)					
Average	-59.7% (p=0.259)	-57.0% (p=0.124)	+4.7% (p=0.821)	-58.4% ** (p=0.015)	-11.1% (p=0.514)
Median	-59.7% (p=0.500)	-57.0% (p=0.500)	-13.9% (p=0.791)	-57.0% (p=0.125)	-35.8% (p=0.597)
Standard deviation	36.4%	15.9%	69.4%	23.0%	66.5%
Min	-85.5%	-68.3%	-83.7%	-85.5%	-85.5%
Max	-34.0%	-45.8%	+114.8%	-34.0%	+114.8%
Observations	2	2	12	4	16
Hot period #3 (2021)					
Average	-48.0% ** (p=0.010)	-34.4% ** (p=0.019)	-15.4% (p=0.346)	-39.7% *** (p=0.000)	-23.8% ** (p=0.036)
Median	-65.2% ** (p=0.016)	-44.7% ** (p=0.042)	-36.5% *** (p=0.004)	-44.9% *** (p=0.001)	-41.0% *** (p=0.000)
Standard deviation	34.6%	40.6%	93.8%	38.0%	79.4%
Min	-93.6%	-85.7%	-91.5%	-93.6%	-93.6%
Max	-4.8%	+46.0%	+404.2%	+46.0%	+404.2%
Observations	7	11	34	18	52

BHAR 2Y	**Private Equity**	**Venture Capital**	**Non-backed**	**Sponsored**	**All**
Total Hot periods					
Average	-23.4% *** (p=0.000)	-22.1% ** (p=0.024)	-9.8% * (p=0.087)	-22.7% *** (p=0.000)	-15.6% *** (p=0.000)
Median	-28.1% *** (p=0.000)	-37.4% *** (p=0.000)	-20.9% *** (p=0.000)	-34.3% *** (p=0.000)	-23.7% *** (p=0.000)
Standard deviation	43.1%	73.8%	68.6%	60.7%	65.4%
Min	-93.6%	-95.9%	-95.4%	-95.9%	-95.9%
Max	+110.9%	+432.7%	+404.2%	+432.7%	+432.7%
Observations	56	60	144	116	260
Total Cold periods					
Average	-10.7% (p=0.678)	-38.5% *** (p=0.007)	-15.4% (p=0.207)	-22.6% (p=0.147)	-18.0% * (p=0.055)
Median	-31.4% (p=0.383)	-36.1% ** (p=0.031)	-30.9% (p=0.169)	-31.4% ** (p=0.042)	-31.1% ** (p=0.021)
Standard deviation	69.8%	21.6%	57.9%	54.8%	56.2%
Min	-85.5%	-68.3%	-83.7%	-85.5%	-85.5%
Max	+137.8%	-13.3%	+114.8%	+137.8%	+137.8%
Observations	8	6	24	14	38

This table presents the Buy-and-Hold Abnormal Returns for the first two years after IPO. Mean, median, standard deviation, minimum and maximum are broken down into eight segments: the entire period (2005-2021), the "Hot period #1" from 2005 to 2007, a "Cold period #1" from 2007 to 2009, a "Hot period #2" from 2010 to 2020, a "Cold period #2" in 2020, a "Hot period #3" in 2021, a "Total Hot periods" segment and a "Total Cold periods" segment. Bootstrapped skewness-adjusted t-tests have been conducted, with results under parentheses. Wilcoxon signed rank tests have been conducted for median analysis and significance levels are expressed by the asterisks: one asterisk means significance level at the 10%, two asterisks mean significance level at the 5%, and three asterisks mean significance level at the 1%.

Table 14. IPO long-term performance by nature of sponsor at Year3 (2005-2021)

BHAR 3Y	**Private Equity**	**Venture Capital**	**Non-backed**	**Sponsored**	**All**
Entire period (2005-2021)					
Average	-22.7% *** (p=0.003)	-30.1% *** (p=0.003)	-16.0% ** (p=0.024)	-26.4% *** (p=0.000)	-20.6% *** (p=0.000)
Median	-31.7% *** (p=0.000)	-50.8% *** (p=0.000)	-41.5% *** (p=0.000)	-40.9% *** (p=0.000)	-41.0% *** (p=0.000)
Standard deviation	59.1%	78.7%	90.9%	69.5%	82.3%
Min	-94.1%	-96.0%	-99.6%	-96.0%	-99.6%
Max	+217.3%	+359.3%	+548.3%	+359.3%	+548.3%
Observations	64	66	168	130	298
Hot period #1 (2005-2006)					
Average	-26.7% (p=0.132)	-30.7% * (p=0.088)	-18.2% * (p=0.076)	-28.0% ** (p=0.031)	-22.3% *** (p=0.005)
Median	-28.8% (p=0.123)	-27.3% (p=0.125)	-29.5% * (p=0.092)	-28.0% ** (p=0.034)	-28.0% *** (p=0.005)
Standard deviation	54.0%	30.6%	45.6%	46.9%	45.8%
Min	-87.2%	-75.6%	-90.3%	-87.2%	-90.3%
Max	+83.8%	+10.1%	+75.6%	+83.8%	+83.8%
Observations	11	5	22	16	38
Cold period #1 (2007-2009)					
Average	+41.6% (p=0.330)	-29.7% (p=0.126)	-49.9% *** (p=0.000)	+13.1% (p=0.623)	-21.3% (p=0.145)
Median	+10.6% (p=0.219)	-27.3% (p=0.250)	-55.1% *** (p=0.001)	+3.5% (p=1.000)	-36.4% ** (p=0.017)
Standard deviation	94.5%	28.2%	31.0%	81.1%	66.0%
Min	-58.1%	-66.2%	-88.6%	-66.2%	-88.6%
Max	+217.3%	+2.0%	+17.6%	+217.3%	+217.3%
Observations	6	4	12	10	22
Hot period #2 (2010-2019)					
Average	-21.7% ** (p=0.013)	-22.1% (p=0.122)	+0.2% (p=0.984)	-21.9% ** (p=0.011)	-10.4% (p=0.161)
Median	-27.7% *** (p=0.005)	-52.4% *** (p=0.004)	-36.1% *** (p=0.006)	-41.6% *** (p=0.000)	-40.7% *** (p=0.000)
Standard deviation	51.5%	93.0%	112.1%	76.2%	96.8%
Min	-90.1%	-94.3%	-99.6%	-94.3%	-99.6%
Max	+120.4%	+359.3%	+548.3%	+359.3%	+548.3%
Observations	38	44	88	82	170
Cold period #2 (2020)					
Average	-84.0% * (p=0.076)	-72.4% * (p=0.070)	-32.5% * (p=0.057)	-78.2% *** (p=0.001)	-43.9% *** (p=0.003)
Median	-84.0% (p=0.500)	-72.4% (p=0.500)	-54.7% * (p=0.052)	-77.2% (p=0.125)	-63.2% *** (p=0.003)
Standard deviation	14.2%	11.3%	52.9%	12.5%	50.0%
Min	-94.1%	-80.4%	-99.3%	-94.1%	-99.3%
Max	-73.9%	-64.4%	+50.2%	-64.4%	+50.2%
Observations	2	2	12	4	16
Hot period #3 (2021)					
Average	-59.2% *** (p=0.003)	-54.3% *** (p=0.000)	-39.0% *** (p=0.002)	-56.2% *** (p=0.000)	-44.9% *** (p=0.000)
Median	-72.0% ** (p=0.016)	-54.5% *** (p=0.002)	-56.3% *** (p=0.000)	-63.2% *** (p=0.000)	-56.4% *** (p=0.000)
Standard deviation	31.4%	33.8%	66.0%	32.0%	56.9%
Min	-93.1%	-96.0%	-94.8%	-96.0%	-96.0%
Max	-12.5%	+8.1%	+247.1%	+8.1%	+247.1%
Observations	7	11	34	18	52

BHAR 3Y	**Private Equity**	**Venture Capital**	**Non-backed**	**Sponsored**	**All**
Total Hot periods					
Average	-27.4% *** (p=0.000)	-28.7% *** (p=0.009)	-11.8% (p=0.141)	-28.1% *** (p=0.000)	-19.1% *** (p=0.000)
Median	-33.4% *** (p=0.000)	-50.8% *** (p=0.000)	-39.4% *** (p=0.000)	-41.6% *** (p=0.000)	-40.8% *** (p=0.000)
Standard deviation	50.8%	81.9%	96.1%	68.4%	85.1%
Min	-93.1%	-96.0%	-99.6%	-96.0%	-99.6%
Max	+120.4%	+359.3%	+548.3%	+359.3%	+548.3%
Observations	56	60	144	116	260
Total Cold periods					
Average	+10.2% (p=0.779)	-43.9% ** (p=0.019)	-41.2% *** (p=0.000)	-13.0% (p=0.554)	-30.8% *** (p=0.003)
Median	+5.9% (p=0.945)	-48.1% * (p=0.062)	-55.1% *** (p=0.000)	-27.3% (p=0.217)	-51.1% *** (p=0.000)
Standard deviation	98.9%	31.4%	43.3%	80.1%	60.1%
Min	-94.1%	-80.4%	-99.3%	-94.1%	-99.3%
Max	+217.3%	+2.0%	+50.2%	+217.3%	+217.3%
Observations	8	6	24	14	38

This table presents the Buy-and-Hold Abnormal Returns for the first three years after IPO. Mean, median, standard deviation, minimum and maximum are broken down into eight segments: the entire period (2005-2021), the "Hot period #1" from 2005 to 2007, a "Cold period #1" from 2007 to 2009, a "Hot period #2" from 2010 to 2020, a "Cold period #2" in 2020, a "Hot period #3" in 2021, a "Total Hot periods" segment and a "Total Cold periods" segment. Bootstrapped skewness-adjusted t-tests have been conducted, results are under parentheses. Wilcoxon signed rank tests have been conducted for median analysis and significance levels are expressed by the asterisks: one asterisk means significance level at the 10%, two asterisks mean significance level at the 5%, and three asterisks mean significance level at the 1%.

The results are partially in line with existing studies on the topic. Broadly speaking, this study confirms Aggarwal and Rivoli's study (1990) who showed that IPOs tend to underperform the market in the years following their listing. Specifically, for all IPOs, the underperformance is statistically significant at the 1% level at both two and three years after the IPO: -15.9% after two years and at -20.6% after three years over the entire period (2005-2021). Results at one year are statistically significant at the 5% level, expressing an underperformance of -6.7%.

By looking at the decomposition by nature of sponsor, Venture Capital, Private Equity, or no-sponsor, mean results are significant for Private Equity-backed IPOs after one year (-13.1% underperformance, statistically significant at the 1% level). Both Private Equity and Venture Capital-backed IPOs exhibit statistically significant underperformance at the 1% level after two and three years, respectively at -21.8% and -22.7% for Private Equity-backed IPOs, and -23.6% and -30.1% for Venture Capital-backed IPOs. Private Equity-backed companies tend to show

less underperformance than Venture Capital-backed IPOs. Meanwhile, non-backed IPOs also express a statistically significant underperformance of -10.6% and -16.0% after two and three years. However, these results indicate a lower level of underperformance than that observed for sponsored IPOs.

These findings allow to reject H_2 of higher long-term performance of sponsored IPOs than non-backed IPOs and infirm the findings of Brav and Gompers (1997), Schöber (2008), and Levis (2011).

7.3 IPO Performance Drivers

Table 15. OLS Regressions results for the 3-year period (2005-2021)

Variable	Regression #1	Regression #2	Regression #3	Regression #4
Intercept	-0.6408 ** (p=0.012)	-0.6616 ** (p=0.016)	-0.7057 ** (p=0.010)	-0.7245 ** (p=0.015)
Initial Return	-0.0287 (p=0.913)	-0.0285 (p=0.914)	-0.0685 (p=0.792)	-0.0681 (p=0.793)
Log(Total Assets)	0.1158 ** (p=0.040)	0.1206 ** (p=0.049)	0.1276 ** (p=0.027)	0.1317 ** (p=0.036)
Leverage	0.0003 (p=0.529)	0.0003 (p=0.537)	0.0005 (p=0.472)	0.0005 (p=0.465)
Asset Turnover			0.0200 (p=0.464)	0.0207 (p=0.455)
EBITDA Margin			0.0005 (p=0.833)	0.0005 (p=0.821)
Dummy PE		-0.1422 (p=0.281)		-0.1588 (p=0.218)
Dummy VC		-0.1101 (p=0.370)		-0.132 (p=0.306)
Dummy Sponsor	-0.1247 (p=0.211)		-0.1455 (p=0.149)	
Dummy Crisis	-0.1322 (p=0.364)	-0.1322 (p=0.364)	-0.1368 (p=0.334)	-0.1371 (p=0.334)
Adjusted R^2	**0.006**	**0.002**	**0.006**	**0.003**
Observations	**298**	**298**	**298**	**298**

This table presents the results for the OLS Regressions on a three-year holding period basis. T-statistics are represented in parentheses under the OLS estimates. Significance levels are expressed by the asterisks: one asterisk means significance level at the 10%, two asterisks mean significance level at the 5%, and three asterisks mean significance level at the 1%.

It can be seen from Table 15 that all four models used express a highly negative intercept, statistically significant at the 5%, which is consistent with Table 14 that IPOs exhibit an overall underperformance on a three-year holding period basis in comparison to the market on Euronext Paris and Borsa Italiana.

The *Initial Return* variable expresses a negative relationship with long-term performance across all models, with coefficients ranging from -0.0685 to -0.0285, although none statistically

significant. This aligns with Levis (2011), who found that initial underpricing is not sustainable and tends to adjust over time. The results presented in the previous table do not allow to confirm or infirm Levis' theory (2011) on Euronext Paris and Borsa Italiana as results are not statistically significant. Therefore, there is insufficient evidence to support H_3 hypothesis.

Size, reflected by the logarithm of the Total Assets at the time of the IPO, shows in all models that a positive relationship exists with IPO long-term performance, from 0.1158 to 0.1317. Results are significant at the 5% level. These findings support the hypothesis H_4 that firm size exhibits a positive relationship with long-term performance and are in accordance with Goergen, Khurshed, and Mudambi (2007).

In contrast, the *Leverage* variable does not show a clear pattern. Coefficients are close to zero and are not statistically significant, suggesting no reliable relationship between leverage and long-term performance. This is therefore in line with the literature as no scientific consensus exists over it.

Regarding operational efficiency, neither *Asset Turnover* nor *EBITDA Margin* is statistically significant. Their coefficients range from 0.0200 to 0.0207 and 0.0005 to 0.0005, respectively, indicating a weak explanatory power. Opposed to Krishnan et al. (2011) study, this does not allow to confirm the hypothesis that operational efficiency has an impact on long-term performance. Therefore, there is no evidence to support H_5.

Sponsorship, meaning Private Equity or Venture Capital, does not exhibit a statistically significant relationship with long-term performance. Private Equity exhibits a non-statistically significant estimate of -0.1588 to -0.1422, while Venture Capital exhibits a non-statistically significant estimate of -0.132 to -0.1101. These findings do not provide enough evidence to accept the academic consensus over Private Equity-backed IPOs long-term overperformance (Schöber, 2008; Levis, 2011) as well as the blurred results over Venture Capital-backed IPOs due to lack of statistical significance. Empirical results do not support the hypothesis that Private Equity and Venture Capital-backed IPOs outperform non-backed IPOs in the long run. On the contrary, univariate tests show that Private Equity and Venture Capital-backed IPOs exhibit lower statistically significant 3-year BHAR compared to the overall sample. However, when controlling for firm-specific characteristics in the multivariate regression, the negative effect of sponsor backing becomes statistically insignificant, not enabling us to support H_2 that sponsored IPOs exhibit higher long-term performance than non-backed IPOs.

The Crisis dummy expresses a negative relationship with long-term performance of IPOs from -0.1371 to -0.1322 although results are not statistically significant, meaning that there is not enough evidence to say that timing is an indicator of IPO long-term performance. Results fail

to provide enough evidence to confirm the findings of Ibbotson and Jaffe (1975) and the hypothesis H_6.

Finally, the adjusted R^2 values across all four models are extremely low, ranging from 0.002 to 0.006. This indicates that the independent variables explain only a very small portion of the variation in long-term IPO performance, and that most of the explanatory power likely lies in unobserved factors.

Table 16. Diagnostic tests for linear regression assumptions

	Regression #1	Regression #2	Regression #3	Regression #4
Homoskedasticity - Breusch–Pagan test				
p-value	p = 0.863	p = 0.877	p = 0.889	p = 0.928
Results	Homoskedasticity	Homoskedasticity	Homoskedasticity	Homoskedasticity
No autocorrelation of residuals - Breusch–Godfrey test				
p-value	p = 0.841	p = 0.842	p = 0.664	p = 0.669
Results	No autocorrelation	No autocorrelation	No autocorrelation	No autocorrelation
Normality of residuals - Jarque–Bera test				
p-value	p = 0.000	p = 0.000	p = 0.000	p = 0.000
Results	Not normal	Not normal	Not normal	Not normal
No multicollinearity - Variance Inflation Factor				
VIF	All VIF < 1.1	All VIF < 1.3	All VIF < 1.2	All VIF < 1.4
Results	No multicollinearity	No multicollinearity	No multicollinearity	No multicollinearity

This table presents the diagnostic tests performed to run the OLS Regressions on a three-year holding period basis. For each test, p-values and results are presented.

Breusch-Pagan test for homoskedasticity checks whether the variance of the residuals is constant across all levels of independent variables. Breusch-Godfrey test for no autocorrelation of residuals detects whether residuals are correlated over time, which would violate the assumption of independent errors in panel regressions. Jarque-Bera test for normality of residuals evaluates whether residuals are normally distributed, based on their skewness and kurtosis. Variance Inflation Factor test assesses whether independent variables are excessively correlated with each other, which could distort the estimation of regression coefficients.

8. Conclusions

In the following section, the conclusion is drawn based on analyses and results operated in this research. It also opens the door for further research on the topic studied.

8.1 Conclusion

This research aimed to identify and provide an analysis of the differences of short-term and long-term performance of new Initial Public Offerings (IPOs) depending on their ownership structure. Drivers of the long-term performance were also studied.

IPOs were divided into several subgroups: Private Equity-backed, Venture Capital-backed, more broadly Sponsored-IPOs, non-backed IPOs, and all IPOs. An analysis of the differences in periods before and after the Subprime Mortgage Crisis, as well as during and after Covid-19 pandemic has also been performed.

The existing literature is made of different results depending on the ownership structure and on the geographical area with a lack of recent information on the area studied in this research. The intent of this research was to provide investors or researchers with robust insight on the topic as no recent study has been conducted on French and Italian stock exchanges. Then, the purpose of this study has been fulfilled even though some results have not proved to be statistically significant.

The analysis has been conducted with a sample of 298 IPOs from 2005 to 2021 on Euronext Paris and Borsa Italiana. Short-term performance has been computed as first-day return and long-term performance has been computed with the Buy-and-Hold Abnormal Return method. A proprietary benchmark has been built, consisting of rebased CAC All-Tradable and FTSE MIB indexes, to be the benchmark operating in the Buy-and-Hold Abnormal Return formula. T-tests have been operated to test mean figures and Wilcoxon signed rank tests have been operated to test median figures. In addition, drivers of the long-term performance have been studied through OLS regression.

Despite not considering every IPO that happened between 2005 and 2021 in Borsa Italiana and Euronext Paris as data has been cleaned before the analysis, excluding Real Estate, Financials, or companies with missing information, the results are believed to depict the truth on the studied framework.

This research demonstrates that results for short-term performance are in line with existing literature regarding Sponsored IPOs expressing lower underpricing than non-backed IPOs.

Regarding long-term performance, using Buy-And-Hold Abnormal Return with a built index as benchmark, results from univariate analysis are more contrasted with the literature with statistically significant results for Private Equity-backed and Venture Capital-backed IPOs, with Venture Capital IPOs expressing the highest underperformance, followed by Private Equity-backed IPOs and then non-backed IPOs.

Regarding the drivers of the long-term performance, results are partially in line with the literature as underpricing does not exhibit a statistically significant negative relationship with long-term performance in this research. On the other hand, size does have a positive impact on long-term performance. Sponsorship does not provide enough statistical evidence to ensure that it influences long-term performance. Ownership structure does not exhibit a statistically significant result of impact on the long-term performance through OLS Regression.

Megginson and Weiss (1991) and Levis (2011) expressed that one of the reasons for superior long-term performance of sponsored IPOs was due to sponsor certification. A difference in the results of the study between this research and theirs could be because sponsor certification in Euronext Paris and Borsa Italiana could have a lower impact than in the UK or in the US. In addition to that, there might be some issues in the results as this study focused on ownership structure and left aside macro-economic and country-specific characteristics.

This study is believed to bring strong evidence for researchers, investors, or any curious person to learn that underpricing and long-term performance differ regarding the ownership structure on Euronext Paris and Borsa Italiana between 2005 and 2021.

8.2 Further Research

After having examined the differences in the studied framework between the subgroups of this research, it could be interesting to focus on the differences between the sponsors. Sponsor certification, expressed by Megginson and Weiss (1991) and by Levis (2011), could differ from time to time or depending on the studied geographical area. For example, it can be seen from Table 2 that some investment funds are widely represented in IPOs. It could be interesting to examine the impact of sponsor's reputation or habit to exit through IPO.

Furthermore, due to the wide proportion of industrials, healthcare, information technology, and consumer discretionary companies in the sample, it could be useful to study the performance differences per sector. Industry-adjusted benchmark could be useful for larger research. Same comment applies for size-adjusted benchmarks.

Including macro-economic and country-specific parameters in the OLS Regression could enable to see if long-term performance depends, or not, on the timeframe and on the area. Also, this research leaves the door open for further research on the performance of impact investing. Private Equity and Venture Capital funds are more and more exposed to impact objectives and decarbonation of their portfolio by their Limited Partners and studying the efficiency of impact investing for sponsors could be excellent research, in the continuity of this one.

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