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"WHY ARE FIRMS LISTED ON SECONDARY MARKETS: AN EMPIRICAL ANALYSIS OF IPOs ON THE AIM ITALIA"

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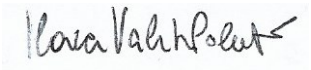

ABSTRACT

The IPO is a topic that has been widely examined in literature; research effort within this field has been given to main markets, while relatively little attention has been brought to secondary markets. In my dissertation thesis, I study the post-listing dynamics of firms going public on the AIM Italia, with the aim of assessing whether listing offers benefits to Italian SMEs. To this end, I study the performance of AIM-listed firms with respect to that of their non-listed peers, detecting if significant differences in corporate performance exist in the post-listing period (t, t+1, t+2, t+3). The sample under analysis consists of 33 listed companies and 484 comparable firms, whose information is available on AIDA database. By employing the R software, I analyse four macro-categories – general characteristics, size and growth, efficiency and profitability, financial structure and liquidity – and construct a multiple linear regression. AIM-listed firms appear to be characterised post-quotation by worse performance indicators with respect to non-listed companies. In fact, the IPO decision seems to determine a reduction of both ROA and ROI, testifying that a significant decrease in profitability occurs as a result of the listing choice. Overall, my finding on the effects of the listing decision is in line with previous literature.

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INTRODUCTION

The Alternative Investment Market (AIM) is a secondary market arranged to satisfy the capital needs of smaller companies. It represents an alternative and complementary mode of funding to finance firms' valuable new investments and growth, at a lower cost. Moreover, it is a market that is gaining in popularity, and its success is undoubtful; in fact, thanks to its flexible regulatory regime, the AIM is attracting a growing number of companies if compared to main markets.

The AIM Italia was founded in December 2008, as an imitation of the AIM UK – one of the most popular secondary markets in the world and a source of inspiration for the youngest markets dedicated to SMEs. Given the relevance of SMEs within the Italian economy and since the listing of SMEs in Italy is a relatively recent and growing phenomenon, the unique and interesting setting provided by the AIM Italia is worthy of study.

The Initial Public Offering (IPO) is a topic that has been widely examined in literature because it represents a turning point in the life of a company, resulting in radical changes in the whole structure of the firm. A variety of perspectives has been adopted by scholars in order to deal with this field of study; among these, the IPO's impact on corporate performance has raised the interest of academics. In this regard, some pieces of research have focused their attention on the comparison between stock exchanges in different countries, others on the comparison of listed and non-public companies, and some other studies have also investigated the post-IPO changes at the managerial-ownership level.

However, it is worth taking notice of the fact that the major research effort within this field has been given to main markets. Instead, companies that go public on secondary markets have received relatively little attention from the empirical literature.

Thus, it is not easy to find studies involving the effects of listing on the AIM. The reason behind the infrequent literature concerning the AIM is linked to the fact that finding data for smaller-sized companies is generally more problematic, making analyses more complex. To the best of my knowledge, no empirical paper focuses on the post-quotation performance of companies listed on the AIM Italia.

Hence, by studying the post-listing dynamics of AIM-listed firms, my dissertation thesis aims to bridge this gap in literature. It is necessary to close the existing gap in order to understand whether listing on AIM Italia offers benefits to companies. More specifically, it is important to

conduct this analysis for all those SMEs that are considering going public, and for those that will consider doing so in the future.

My dissertation thesis is organised as follows. Chapter 1 introduces the AIM Italia, by presenting the general figures of this secondary market, the listing requirements, the steps and subjects involved in the listing process. Chapter 2 gives an overview of the existing literature on IPOs, with a particular insight into the post-listing effects on the performance of newly-listed companies. Chapter 3 presents my empirical research: the method, the descriptive statistics and the statistical analysis. Finally, Chapter 4 reports the results of my study and answers the research question, bridging the gap in literature.

THE ITALIAN ALTERNATIVE INVESTMENT MARKET

1.1 AIM Italia: a means of financing to support the growth of SMEs

The Italian economy is characterised by a dynamic network of Small and Medium-sized Enterprises[1] (SMEs). The relevance of SMEs within the Italian business landscape is confirmed when looking at other European economies; in fact, Italy enjoys the largest pool of SMEs in Europe, whose value added is second at European level (Borsa Italiana, 2013).

The Cerved Report (2019) identifies about 5 million SMEs, of which 130 thousands are small and 26 thousands are medium-sized companies. The 99% of Italian businesses are SMEs, which employ 82% of workers and create about 70% of the Italian value added. In absolute terms, SMEs employ over 15 million people and generate a total turnover of €2,000 billion (Il Sole 24 ore, 2019). Hence, these numbers testify that SMEs are a salient feature of the Italian economy.

Within this context, the banking system plays a central role in providing SMEs with the necessary inflow of financial resources. In fact, SMEs mostly have a financial structure oriented towards the procurement of funds from the banking sector (D'Amato and Cacia, 2008). Not by chance, the Italian financial system is defined as bank-centred. However, this distinctive characteristic has implied a marginal role of the Italian stock market. The development of the Italian stock exchange has been slow and a limited number of firms rely on the financing role of equity markets (Aiello and Silipo, 1997). Consequently, a poor representativeness of the Italian economy is provided by the stock exchange – listed industrial and commercial companies account for just 5% of the national value added (Consob, 2011).

Overall, a scarce propensity of firms, especially of SMEs, towards listing is evident. The low interest in going public is traditionally linked to the peculiar characteristics of SMEs. These are, for example, the entrepreneur's fear of losing control of the family business, the reluctance in offering share capital to third parties, the lack of a managerial culture projected towards advanced financial management, the will to maintain high levels of informality in corporate governance, and a resistance to transparency and information release (D'Amato and Cacia, 2008).

Yet, the lack of diversified financing channels represents a potential constraint to the development and growth of Italian companies (Paleari et al., 2008). The reliance on bank credit

[1] A SME, as defined by Italian law, is a company falling under the category of micro, small and medium-sized enterprise. It is an enterprise with less than 250 employees and registering no more than €50 million in annual turnover or no more than €43 million in annual total assets. More specifically, within this category of firms, a small business is an enterprise with less than 50 employees and annual total revenues or assets not exceeding €10 million, and a micro business is an enterprise with less than 10 employees and annual total revenues or assets not exceeding €2 million (Decreto Ministeriale, 2005).

is not sustainable in the medium-long term for companies that intend to grow and compete on international markets. Therefore, there is the need to reduce the dependence on the banking sector and access new forms of finance. In this respect, the decision to go public represents a stable alternative to support internal and external growth opportunities.

In this direction, Borsa Italiana[2] has promoted the development of an equity market targeting the expansion of small-sized firms: following the experience of the London Stock Exchange (LSE), Borsa Italiana created AIM Italia, the secondary market dedicated to SMEs. This initiative aims to respond to the financing needs of smaller companies, while building on the economic specificities of the Italian context (Cacia and D'Amato, 2008). In fact, the design of AIM considers the most critical aspects of the Italian economy, including the lower financial culture of small-sized companies, the lower formalisation of the governance and management processes of SMEs, the difficulty for SMEs in meeting listing requirements and in facing the long and onerous listing process (Franzosi and Pellizzoni, 2003). Furthermore, at domestic level, initiatives favouring the access to alternative funding channels and capitalisation through risk capital have been implemented by policy makers. In actual fact, over the last couple of years, numerous incentives[3] have been formulated to encourage companies, in particular SMEs, to list on AIM Italia (Annese et al., 2019).

AIM Italia thus represents an alternative means to raise financial resources. For the entrepreneurial reality of our country, the possibility of accessing AIM constitutes an important boost to the development and expansion of SMEs. With this in mind, the following pages present the unique and interesting setting provided by AIM Italia.

[2] Borsa Italiana S.p.A. was founded in 1998, as a result of the privatisation of the Italian financial market, and is the company that manages the functioning of the Italian stock market.

[3] The regulation on PIRs, the tax credit on listing costs, the spreading of SPACs, have all contributed to enlarging the financing opportunities for SMEs.

-The Italian budget law (2017) introduced the regulation regarding PIRs (Piani Individuali di Risparmio), which are individual saving schemes. PIR saving schemes must invest at least 3.5% in financial instruments listed on MTFs, namely AIM Italia, and issued by SMEs. The objective of PIRs is to boost the flow of national savings invested in Italian firms; to achieve this goal, investors are stimulated to invest their savings in PIR-compliant products through tax incentives.

-From January 2018 until December 2020, SMEs are granted the concession of a tax credit, up to a maximum amount of €500 thousands, on 50% of the advisory costs incurred for listing on the stock market. These costs include all expenses related to the specific advice needed to assess the feasibility of the IPO and to support the company during the process (IR Top Consulting, 2018b).

-Special Purpose Acquisition Companies (SPACs) are an instrument to help companies to get listed. They are an investment vehicle, with no previous operating activities, set up by a team of promoters with the aim of raising capital through an initial public offering and subsequently deploying it to acquire or merge with a private company – that, as a result of the business combination, will be listed on the stock exchange (Borsa Italiana, 2018).

1.1.1 Introduction to AIM Italia

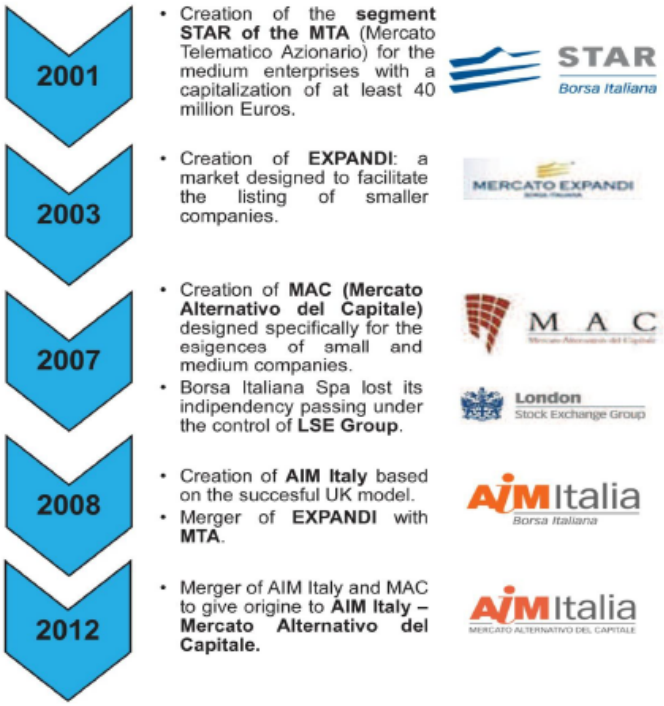
The very first attempts to establish second markets for growing companies date back to the 1980s. In these years, the so-called feeder markets were established, starting from the US; but most of them did not survive to the 1987 stock market crash. In this direction, further attempts at domestic level were made during the subsequent decade: the AIM in 1995 (UK), the Nouveau Marché in 1996 (France), the Neuer Markt in 1997 (Germany) and the Nuovo Mercato in 1999 (Italy). The growth of these markets, however, was limited only to their earliest years (Revest and Sapio, 2011). In this respect, AIM UK represents an exception, being an example of resilience. AIM UK is, in fact, the only second-tier market for growing companies within the European context that has managed to survive. Actually, it has not only managed to survive, but it has also been subject to an extraordinary growth in capitalisation and number of listings, thus becoming the world's leading market for growing companies (London Stock Exchange, 2015).

Given its success, AIM UK has been taken as a model by numerous national exchanges, including Borsa Italiana. In December 2008, following the acquisition of Borsa Italiana by the LSE, AIM Italia was born as an imitation of the successful AIM UK.

Until a decade ago, the Italian stock market offered limited listing possibilities to SMEs. Hence, the AIM has filled an offer gap, by providing milder access requirements and rules more consistent with the characteristics of small-sized firms and of the Italian economy (Cacia and D'Amato, 2008).

Of course, a series of attempts to create a stock market for SMEs, in Italy, had been launched before. In this regard, Figure 1.1 illustrates the evolution of the Italian stock exchange during the first decade of this century.

Figure 1.1: Evolution of the markets dedicated to SMEs



Source: Borsa Italiana

The Expandi market has been, for instance, an alternative proposed for the access of small-sized companies to the financial market. Given the limited results obtained by the latter market, a further experiment took place in 2007 with the creation of the Mercato Alternativo del Capitale (MAC), designed for the needs of SMEs. Yet, in 2012, only 11 companies were listed on the MAC. Therefore, it merged into AIM Italia, rationalising the offer of Italian markets dedicated to SMEs and with the aim of creating a single and successful market addressed to this category of firms.

AIM Italia is a Multilateral Trading Facility (MTF) pursuant to the MiFID directive[4]. This means that AIM is not a regulated market as defined by law, but an exchange-regulated market (Ighini and Tambalo, 2016). In other words, it is not subject to the regulations of Consob[5], it is

[4] The MiFID directive has brought important changes in the market structure of European capital markets. MTFs, of which AIM is the most representative reference model, are regulated through the MiFID.
The MiFID directive conceives MTFs as an alternative place of exchange for financial instruments already listed on regulated markets. Actually, MTFs frequently appear as autonomous markets, coordinated by the same management company of regulated markets, whose peculiar characteristic is that the rules concerning admission to trading, information transparency and market microstructure are established mainly by the management company and only minimally by the law or regulations (Ferragina et al., 2008).

[5] The Consob (Commissione Nazionale per le Società e la Borsa) is the regulatory body which governs Italian equity markets.

subject to the regulations issued by Borsa Italiana instead – that are, as explained in Paragraph 1.2, the Issuers' Regulation and the Nomad Regulation.
Furthermore, in December 2017, AIM Italia was registered as a SME Growth Market, which is a new sub-category of the MTFs – introduced by MiFID II – aimed at facilitating access to capital for SMEs. An advantage lies in the SME Growth Market qualification; in fact, such qualification contributes to increasing the visibility and standing of AIM Italia and of AIM-listed companies, also allowing them to benefit from the future regulatory initiatives dedicated to these markets (Il Sole 24 ore, 2017).

1.1.2 Key figures

Last year AIM Italia celebrated its tenth anniversary; from 2009, 186 companies listed on this market, including market transfers (14), takeover bids (12) and delistings (24) (4AIM SICAF, 2020).
As of today, 35% of the companies on the Italian stock market are listed on AIM Italia. The Table 1.1 below indicates some general figures of the Italian market dedicated to SMEs, like the total number of companies, the total capital raised in IPOs and the market capitalisation (Source: Borsa Italiana).

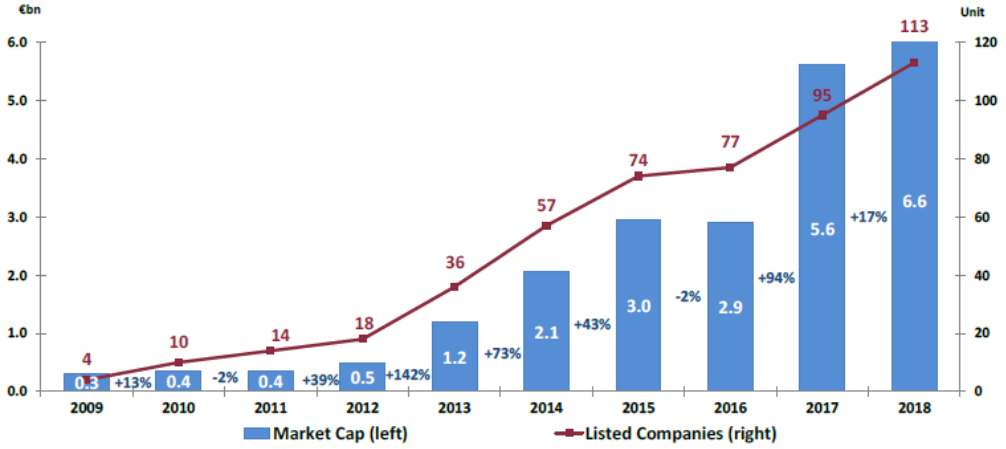
Table 1.1: Key figures of AIM Italia

Companies	133 (as of 09.11.2020)
Sectors	10
Total Money Raised at IPO	€3.9 billion
Total Market Capitalisation	€5.6 billion

Source: Personal elaboration from Borsa Italiana

The number of IPOs on AIM Italia has steadily been increasing in the last years (view Figure 1.2). In 2019, the AIM recorded its highest yearly number of placements, marking a new record with 35 new listings, of which 31 IPOs and 4 admissions post business combination (versus 26 IPOs and 5 listings in 2018). Given these promising results, AIM Italia is becoming a leading European financial hub – as of the number of new companies listed on non-regulated markets (Finanza Operativa, 2020).
The median value of capital raised when joining AIM Italia is €5 million, and the majority of AIM-listed companies have a capitalisation between €10 million and €30 million (Annese et al., 2019).

Figure 1.2: Market Cap and number of AIM Italia companies, 2009-2018



Source: EnVent Capital Markets, 2019

In general, business activities conducted by AIM-listed companies are diversified, testifying the variety of the national economic context. The most relevant sectors in terms of company concentration are finance and insurance (25%), services (18%), industry (17%) and technology (12%) (Annese et al., 2019).

While as for geographical distribution, Northern Italy is more represented. The regions most present on AIM are: Lombardy (41%), Emilia-Romagna (14%), Lazio (11%) and Veneto (8%) (Finanza Operativa, 2020).

On an aggregate level, in 2018, non-financial companies (excluding SPACs) recorded consolidated revenues of €7.2 billion and EBITDA of approximately €1 billion. At company level, in the same year, more than half of the AIM-listed companies had a turnover of less than €30 million and an EBITDA of around €4 million. Moreover, the total number of employees working for the AIM-listed firms in 2018 were about 20,000 (Annese et al., 2019).

In addition, the 41% of AIM companies are classified as SMEs according to EU regulations and 29% are innovative SMEs[6]. Nearly half of them have conducted acquisitions and a third of them hold at least one patent (Annese et al., 2019).

If governance is considered, the ownership structure of firms listed on AIM Italia tends to be quite concentrated. In particular, more than half are controlled by a shareholder holding more than 50% of the stakes (Ciavarella et al., 2018).

Finally, as for transparency, it is clear that AIM companies are less prone to voluntary disclosure. In 2018, only 17% of AIM companies voluntarily disclosed quarterly financial information (Ciavarella et al., 2018).

[6] The definition of innovative SME is given by the Investment Compact Decree (Law n.33 of 24 March 2015). Innovative SMEs must meet requirements relating to R&D expenditure, staff qualifications and technological innovation, and can benefit from some tax advantages and incentives.

1.2 Regulation of AIM Italia

The regulation of AIM Italia incorporates the main features of AIM UK, with slight adaptations in order to better respond to the peculiarities of the Italian economy (Ferragina et al., 2008). Recall that AIM is a MTF and, therefore, not a regulated market; it is instead an exchange-regulated market subject to the rules approved by Borsa Italiana. These rules are intentionally simplified in order to meet the needs of SMEs, which find it difficult to comply with the stricter norms of the main market. In fact, the key difference characterising the AIM with respect to the main market consists in considerably less stringent obligations and simpler listing process.
According to Revest and Sapio (2011), AIM Italia is regulated through a principle-based approach[7], meaning that the assessment of the firm's suitability is performed by a specialised financial intermediary (the NOMinated ADviser) who holds discretionary power in conducting the evaluation. Actually, the figure of the Nomad, who acts as gatekeeper, adviser and, ultimately, regulator of AIM-listed companies, is central in AIM.
The following pages deal with the listing requirements of AIM Italia and provide some insight into the main steps/subjects involved in the listing process.

1.2.1 Listing requirements

The regulatory system of AIM Italia is extremely flexible if compared to other markets, with less stringent obligations and lower costs. For instance, unlike other markets, going public on AIM is subject to the compliance with few and simple conditions and does not require meeting minimum requisites in terms of size, positive track record or corporate governance (Ferragina et al., 2008).
The formal requirements, which refer to the admission, oversight and disclosure processes, are detailed in the Regulations of AIM Italia. The regulatory system is based on two main regulations: the 'Regulation of the Issuer' and the 'Regulation of the Nomad'.

The 'Regulation of the Issuer' dictates the pre- and post-IPO requirements, which are briefly described below (Source: Borsa Italiana).
In order to go public, AIM Italia requires the issuer firm to meet the following obligations:

[7] Conversely, the main market is regulated through a rules-based approach, meaning that the listing requirements are objectively defined and the listed firms must comply with formal rules (Revest and Sapio, 2011).

- to be established as a joint stock company (S.p.A), or as the analogous of a joint stock company in the legislation of the country of origin;
- to appoint the Nomad;
- to respect the free float eligibility criteria. The free float must be of at least 10%, this is the minimum portion of floating shares required on the market and must be split among at least 5 professional investors (or, alternatively, among 10 investors, 2 of whom professionals);
- to prepare the admission document, alias prospectus. The prospectus contains information relating to the company's business, management, shareholders and economic-financial data; yet, it contains less information and not all the chapters envisaged for the traditional prospectus;
- to release the last audited financial statement. Where existent, the company's latest financial statement must be prepared according to national or IAS/IFRS standards and be certified by a statutory auditor. The presence of a minimum number of financial statements is not required;
- to have a website.

The satisfaction of the above-mentioned pre-IPO requirements is definitely easier than complying with main market norms. In reality, the most difficult part consists in being able to convince the Nomad that the company in question is ready to go public on AIM Italia (Ferragina et al., 2008).

Moreover, companies listed on AIM Italia must satisfy the following post-IPO requisites:

- to have a Nomad. If the firm ceases to have a Nomad, the security is temporarily suspended from trading on AIM Italia, and the failure to reappoint a Nomad within two months represents the ground for a withdrawal from trading (the admission to the market is cancelled);
- to appoint a specialist or underwriter. The presence of a specialist is necessary to support the liquidity of the stock. The presence of this figure, like that of the Nomad, must be continuous. The specialist must also make at least two researches per year concerning the issuer, in correspondence of the yearly and half-yearly publication of the operating results, which must be published on the Borsa Italiana website no later than one month from the approval of the accounting data;
- to publish the half-yearly and annual reports on economic-financial performance: the balance sheet, income statement, cash flow statement must be released. The half-yearly report must be presented within three months from the end of the period in question, and the annual financial statement must instead be presented within six months from the

end of the financial year. Also, the annual financial statements must be subject to statutory audit while this is not the case for the half-yearly reports. Accounting information can be prepared just in Italian (English is optional);

- to have a website. It is mandatory to manage a website where information relating to the description of the business and its management, the statute, the financial statements, press releases, the admission document, the Nomad and the significant shareholders are made available;
- to disclose information on price sensitive and extraordinary operations;
- to appoint a SDIR. The issuer must appoint a SDIR (System of Dissemination of Regulated Information) to ensure that the required information is communicated in the manner and within the timeframe contemplated by the regulation.

Tables 1.2 below summarise the pre- and post-IPO requirements of AIM-listed firms. Also information relating to the main market (MTA) is inserted, for the sake of comparison.

Table 1.2a: Pre-IPO Requirements

Requirements	AIM	MTA
Market cap	No formal requirement	Minimum €40m
Audited financial statements	1 (if existent)	3
Accounting principles	Italian or international	International
Free float	10%	25%
IPO offer	Mainly institutional	Institutional, retail
Documents required	Admission document	Prospectus, SCG, Business plan
Governance	No formal requirement	Recommended
Website	Mandatory	Mandatory
Advisors	Nomad	Sponsor/Global coordinator

Source: Personal elaboration from Borsa Italiana

Table 1.2b: Post-IPO Requirements

Requirements	AIM	MTA
Quarterly data	No formal requirement	No formal requirement
Half-yearly data	Mandatory (within 3 months)	Mandatory (within 3 months)
Annual report	Mandatory (within 6 months)	Mandatory (within 4 months)
Information disclosure	Price sensitive and extraordinary transactions	Price sensitive and extraordinary transactions
Governance[8]	No formal requirement	Recommended
Website	Mandatory	Mandatory
Specialist	Mandatory both Nomad and Specialist	Optional

Source: Personal elaboration from Borsa Italiana

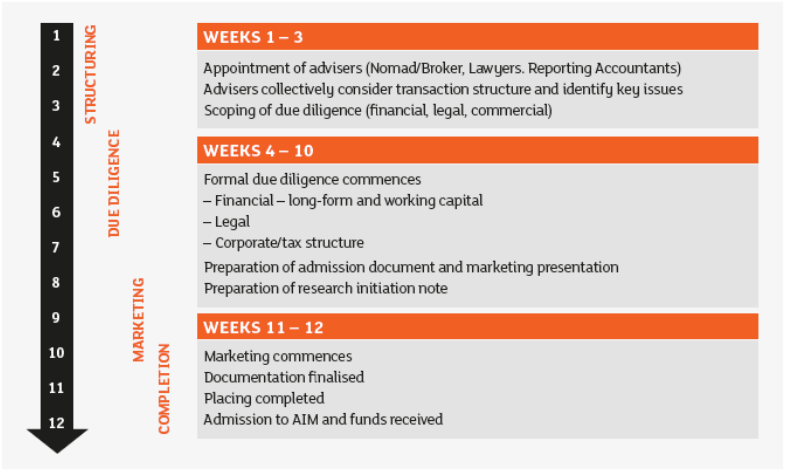
[8] Common market practices consist in having at least one independent director in the corporate body and in having members of the board of statutory auditors that are independent.

Furthermore, it is worth to point out that listing on AIM Italia is not only subject to the fulfilment of formal requirements. In fact, Borsa Italiana recommends to verify – before starting the listing process – the presence of a series of substantial requirements, in order to understand whether the company being listed can be considered adequate for going public and attractive by institutional investors. Substantial requirements regard the characteristics and growth prospects of the company in question and should not be underestimated[9], since they are necessary for third parties' appreciation.

1.2.2 Steps and subjects involved in the listing process

The process of admission to listing on AIM Italia is characterised by a short timing, especially if compared to other markets[10]. It is estimated to last for about 12 weeks (view Figure 1.3).
The timing may last a little longer if the company, before starting the listing process, is not "ready" and requires a pre-IPO preparation phase – meaning that it must implement significant internal reorganisation activities (Ighini and Tambalo, 2016).

Figure 1.3: Indicative timetable



Source: London Stock Exchange, 2015

A brief summary of the main steps of the listing process is explicated below (view Table 1.3) (London Stock Exchange, 2015).

[9] Such characteristics include some strategic, economic-financial and organisational aspects of the company. For example, these are: a successful track record, a clear vision, growth potential of the business model, a good competitive positioning; company's credibility, management expertise and integrity; solid financial structure, transparent financial communication to the market; orientation towards internationalization, value creation and innovation capacity (Source: Borsa Italiana).
[10] It is reasonable to expect a minimum timing of the IPO process of 6-8 months for MTA and 3-4 months for AIM Italia, without considering the pre-IPO activities (Borsa Italiana, 2018).

In the *12 weeks prior* to listing, the preparation phase for the listing begins. This phase comprehends the choice of the Nomad, the definition of the work plan with the Nomad and the nomination of the other advisors involved. The preliminary assessment of the company is made, together with the verification of IPO requirements, the understanding of the strategic objectives of the business plan, and the construction of the equity story and of the investor relations strategy. In addition, the Nomad must start preparing the due diligence, by reviewing problematic fields of concern, and must draft the documents required for listing (the admission document[11]).

In the *6 weeks prior* to listing, the due diligence practices[12] and the admission document are completed. The Nomad sets out the marketing strategy for the IPO and the structure of the roadshow. Also, the presentation for investors is prepared, further meetings with the financial community are held, the roadshow and book-building[13] activities are carried out.

10 days before the scheduled admission date, the application for the pre-admission to Borsa Italiana is submitted. In the pre-admission notice, the information specified in the Issuer's Regulation is contained, including a brief description of the business, information relating to

[11] The most relevant document for listing on AIM is the Admission Document. This is not only a key regulatory document, but also the main marketing document. AIM regulation sets out the specific requirements for the admission document, which deal with four main areas: an overview of the business; a description of the risks linked to the firm and its shares; historical financial information; legal disclosures (e.g. contracts, intellectual property rights…). The approval by the Consob is not required, and the management of the firm is legally responsible for the contents released in the admission document (London Stock Exchange, 2015).

[12] In order to assess the suitability of a company, lawyers and accountants, together with the Nomad, conduct due diligence practices (an in-depth review of every aspect of the business). In this respect, availability of information is facilitated by providing all parties with the possibility to access to a virtual dataroom (London Stock Exchange, 2015). Due diligence involves (Ighini and Tambalo, 2016):

-Financial due diligence: the assessment of the issuer's financial structure, such as the analysis of the net financial position and net working capital, and investigations on the existence of debt covenants, overdue commercial/financial/tax debts, overdue trade receivables and derivative contracts;

-Business due diligence: the analysis of the issuer and its corporate group, of the business model, reference market, competitive positioning and strategy;

-Fiscal due diligence: the verification of the documentation relating to the last financial year, the assessment of any tax disputes or tax audits in progress, of transfer pricing policies, as well as tax exemptions/reductions/concessions that the issuer has enjoyed in the last three years;

-Legal due diligence: the analysis of corporate documents released during the last year, of documents relating to extraordinary transactions during the past three years, of relevant contracts in place, litigations in progress, pending proceedings, tangible and intangible assets, intellectual property, trademarks and patents, employees, and transactions with related parties.

The due diligence phase usually ends with the preparation of two confidential reports, which represent the foundation of the admission document. In the first report, the Nomad gives an opinion on the accounting procedures adopted by the company and on the frequency of the processing of economic-financial data. In the second report, the working capital report, the company's availability of sufficient operating capital in the first 12 months after the listing is communicated (Ferragina et al., 2008).

[13] Book-building is the phase in which the Global coordinator collects data from institutional investors' orders, sorts them out according to specific variables, hence fixing the price of the securities.

shareholders and members of the corporate governance, as well as relating to the characteristics of the placement and the expected date of admission to AIM Italia (Lovells LLP, 2009).

1 week before admission to listing, all documents are approved, the characteristics of the offer are defined and the price is established.

Finally, at least *3 trading days before* the scheduled admission date, the issuer is required to submit the definitive application form to Borsa Italiana, together with the admission document, evidence of payment of the fees for admission and the declaration of the Nomad (Lovells LLP, 2009).

Table 1.3: Summary of the listing process

Preparation	Due diligence	Admission and Placement
Company restructuring where appropriate	Formal due diligence	Road-show and book-building
Possible governance modifications	Creation of equity story	Pre-admission (10 days before)
Auditing of financial statements	Definition of listing-timing	Admission application (3 days before)
Adoption of international or Italian accounting standards	Organisation of placement consortium	
Definition of business plan	Pre-marketing with investors	
Initial contacts with Borsa Italiana and consultants		
Choice of consultants		
Adoption of adequate management control		

Source: Personal elaboration from Borsa Italiana

Furthermore, as already mentioned, the most important figure involved in the listing process is the Nomad, who acts as a middleman between the company and the stock exchange, coordinating the listing process and being a guarantor for the company towards the financial community.

The subjects authorised to carry out the role of the Nomad are registered on a dedicated register of Borsa Italiana, which can be consulted on the Borsa Italiana website. Also, the figure of the nominated adviser is subject to a specific set of rules, the 'Regulation of the Nomad', which claim that the Nomad must possess the following requirements:

- to be a bank, an investment firm, financial intermediary, or a company belonging to a network of statutory auditing firms;
- to submit financial statements to the opinion of a statutory auditor;
- to have exercised corporate finance activities for at least two years, and have adequate experience in providing professional advice in relation to corporate finance transactions;
- to have a sufficient number of employees to carry out the required activities;
- to have professional executives with adequate experience and technical expertise in corporate finance and market practices;

- to be independent from the assisted firm and in no way have a conflict of interest with the AIM Italia firm.

More specifically, companies that intend to list on AIM Italia are introduced by the Financial Advisor to the Nomad. After being appointed by the company, the Nomad has the task of controlling the enforcement of the obligations established in the regulations of AIM Italia: the Nomad guarantees to Borsa Italiana that all the listing procedures and post-listing requirements are respected.

Most importantly, the Nomad is responsible for assessing the suitability of the company applying for admission to AIM Italia. In other words, the admission is subject to the Nomad's decisions and evaluations, and the Nomad is the figure who choses whether a company can go public on AIM Italia. Hence, since certification by the Nomad is equivalent to admission to the market, the Nomad is the person responsible towards Borsa Italiana and puts at stake its own reputational capital (Ferragina et al., 2008). Therefore, the real challenge for firms in the initial phase of the listing process is to find and convince a Nomad that they are appropriate to be admitted to AIM Italia (Revest and Sapio, 2011).

Together with assessing the appropriateness for quotation, the Nomad assists and guides the firm in the admission phase and for the entire duration of its stay on the market. In the case that the Nomad deems that the listed firm, for which the Nomad is operating, may no longer be appropriate for AIM Italia, it must notify Borsa Italiana (Lovells LLP, 2009).

Finally, the Nomad may also perform the role of global coordinator and specialist (AEMConsulting, 2018).

Who are the other consultants that can be involved in the listing process of AIM Italia? Table 1.4 below provides a schematic answer to this question (Borsa Italiana, 2018).

Table 1.4: Other subjects involved in the listing process

Subject	Role
Specialist	The Specialist performs the function of liquidity provider, guaranteeing the liquidity of the shares and continuously exposing on the market purchase or sale offers. The role of Specialist, Global Coordinator and Nomad can be performed by the same person, if in possession of the necessary requirements.

Global coordinator	The Global Coordinator is an intermediary with the task of placing the company's securities on the market, after having defined with the company the type of target investors, the most appropriate price and the investor relations strategy to be adopted. It plays a coordinating role, in collaboration with the Nomad, of the entire operation. The role of Specialist, Global Coordinator and Nomad can be performed by the same person, if in possession of the necessary requirements.
Legal advisor	The legal advisor assists both the issuing company and the other actors involved (such as the Nomad) on legal, fiscal and contractual aspects connected to the listing process. For instance, it supports the Nomad in preparing the admission document and carrying out legal and fiscal due diligence.
Auditing firm	The auditing firm, in addition to auditing the latest financial statements of the company being listed and expressing an audit opinion, verifies the reliability of the content of the business plan and of the admission document, and assesses the issuer's creditworthiness through a specific report on net working capital. In this way, the auditing firm supports the Nomad in due diligence activities.
Financial advisor	The financial advisor assists the company in the realization of the business plan and of the company's management control system, and in evaluating the feasibility of the entire operation. It also supports the company in the organisation of the operation: in creating the team of actors participating in the process, in managing the relationship with Borsa Italiana and with the other actors involved in the admission process.
Investor Relations advisor	The Investor Relations advisor is essential to ensure the success of the IPO and promote SMEs as an investment opportunity for institutional investors. With the listing on AIM Italia, a continuous relationship is established between the company and the investors; the creation of the equity story and the management of the IR activity are strategic to promote the listed SME and to ensure the liquidity of the securities listed on AIM Italia.

Source: Personal elaboration

In conclusion, from the previous pages, it is clear that AIM Italia has been conceived as a market with a regulatory approach balanced between the needs of businesses and investors. It is therefore possible to claim that the AIM Italia's design, characterised by regulatory flexibility,

little bureaucracy and ease of access, represents the point of strength of AIM (Borsa Italiana, 2018).

1.3 The listing decision: Why listing?

Most successful entrepreneurs usually arrive at a certain stage in the development of their firm when they need to make a delicate decision for the future: the listing decision.

Why listing? The answer can be found in financial and non-financial reasons. Listing is a means of access to financial, managerial and intangible resources, which are functional to the development process of businesses. Thus, listing can have a strong impact on firms' competitiveness, opening new horizons of growth and visibility (Borsa Italiana, 2012).

Yet, any decision comes at a cost. Unfortunately, the majority of costs – since they are often not proportional to the size of the IPO – tends to weigh more on smaller firms. Instead, the same costs represent a lower burden for larger firms, which are better able to amortize them over higher sales volumes (Nielsson, 2013). As a consequence, the net benefits of going public on tightly regulated markets are lower for SMEs, which would rather consider listing on more loosely regulated markets like AIM.

With this in mind, it must be noted that any company considering the possibility of listing will make a cost-benefit analysis (EY, 2015), as shown by the following Table 1.5.

Table 1.5: Why listing? Cost-benefit analysis

	Staying private	Going public
PROS	✓ Retain 100% of the share capital ✓ Remain independent from third parties	✓ Raise capital to boost organic growth and M&A ✓ Use shares as currency ✓ Improvement of the credit standing ✓ Improvement of image and market visibility ✓ Possibility to attract and retain talents ✓ Ensure continuity in the generational transition ✓ Visibility and controllability of the value of the firm ✓ Flexibility and ease to liquidate the investment ✓ Opportunity for diversification
CONS	× Limited resources to catch opportunities to accelerate growth × Weaker position in macro-economic downturns × Limited market visibility and brand awareness × Risk of discontinuity in the generational transition	× Disclosure requirements × Reduction or loss of control × Commitment and responsibility towards the market × Costs

Source: Personal elaboration

1.3.1 Pros deriving from listing on AIM

As previously stated, the going public decision is linked to a series of benefits. The main advantages for the firm and its shareholders are identified and briefly explained below.

Opportunity to raise capital to promote growth & to use shares as currency.

For most companies, the possibility of raising capital to finance growth and new valuable development projects plays a major role in the listing decision (Cacia and D'Amato, 2008; Paleari et al., 2008). In fact, thanks to the financial resources collected through the IPO, firms can facilitate both internal/organic growth and external growth (Ferragina, 2007).

In addition, as for the latter, going public allows M&A transactions to be carried out through the exchange of shares (Ferragina et al., 2008). The shares can be used as collateral with credit institutions and as a form of payment, given that the value of a listed company is constantly reviewed thanks to the continuous updating of the market prices of securities.

Reduction of dependence on the credit system & improvement of credit standing.

Listing does not only reduce the dependence on the banking credit system by diversifying the sources of financing, but also contributes to the improvement of the corporate credit standing. Listing allows companies to access to credit faster and more easily and to borrow more cheaply than unlisted companies (Pagano et al., 1996). As a matter of fact, during the IPO period, the interest rate on the firms' short-term credit drops and a greater number of banks is willing to lend to them.

Improvement of the corporate image and credibility.

A significant benefit involves the improved visibility and brand awareness in the market, and strengthened credibility of the issuing company.

Listing on the stock exchange represents for the firm an important opportunity to show up to the economic and financial community, hence increasing market visibility (4AIM SICAF, 2020). Also, thanks to the greater transparency imposed by financial markets, listed companies acquire higher reliability compared to their unlisted competitors; not by chance, a lower degree of riskiness is often associated to listed companies.

Reputation thus, on the one hand, becomes a marketing lever for the company and, on the other hand, allows the company to increase its bargaining power towards suppliers and customers (Ferragina et al., 2008).

Attracting & retaining talents through stock options.

Going public represents a possibility for the company to attract qualified managers and employees (Cacia and D'Amato, 2008). Attracting valuable human resources is a first necessary step for growth that goes hand in hand with the design of ad hoc compensation schemes, which help to retain the management and professional figures relevant for the development of the company (Ferragina, 2007).

Borsa Italiana (2009) reports that a listed company is better able to motivate and involve managers and employees in the business results, through the introduction of share incentive schemes (e.g. stock option plans). These are compensation schemes dependent on the stock price evolution that create a direct link between company's performance and reward, thus positively influencing productivity and quality of work.

Facilitation of the generational transition.

Going public serves as a tool for solving corporate restructuring problems and problems of generational transition. In fact, through an IPO, it is possible to liquidate the shares of family

members no longer interested in the management of the firm, yet ensuring continuity to the business (Ferragina, 2007).

Visibility and controllability of the value of the firm.

The market value of the public firm is objective and visible by any investor. Actually, the value of each security is continuously displayed and updated, meaning that it is possible for anybody to know the cost of an investment in securities and check its evolution on the market (Ferragina, 2007).

Flexibility and ease to liquidate the investment.

In literature, the second most cited reason for listing regards the chance, for shareholders, to convert wealth into cash in the future (Paleari et al., 2008). Listing on the stock exchange allows shareholders to monetise their investment, outlining a possible way out whenever they no longer wish to play an active role in the company. In other words, the negotiability of the securities on the market permits investors to liquidate, in whole or in part, their stakes more easily (Ferragina, 2007).

Opportunity for diversification.

IPOs represent direct and indirect opportunities for diversification, either by divesting from the firm and reinvesting in other assets, or by making the firm raise capital after the IPO and acquire stake in other companies (Pagano et al., 1998).

Besides the above mentioned advantages deriving from listing, which can be referred to going public in general (no matter whether on a main or second market), it must be noted that AIM Italia also offers some additional specific and unique benefits to IPO firms. In particular, two pros linked to the admission on AIM, which have already been examined in detail in Paragraph 1.2, are listed below.

Flexible regulatory environment.

AIM Italia is built on a flexible regulatory system, enjoying lower pre- and post-quotation requirements compared to the MTA. For instance, unlike regulated markets, AIM Italia does not require minimum admission criteria in terms of company size, corporate governance or economic-financial track record. The basic requirement is the continuous presence of the Nomad, both in the pre-admission and post-admission phases.

The whole set of regulatory requirements is specifically calibrated on the structure of SMEs, thus making AIM Italia as open as possible to growing companies (London Stock Exchange, 2006).

Fast and simplified admission process.

AIM-listed firms benefit from a shorter timing of the admission to listing phase and from a reduced bureaucracy that contributes to simplifying the admission process.

In fact, as previously mentioned, it takes SMEs less than six months from the going public decision to the listing on AIM Italia and, in just 10 days from the first company communication, the AIM is able to admit firms. Hence, if compared to the listing process on other markets, this second market experiences a significant reduction in the expected timing of the listing process (Lovells LLP, 2009).

The admission process is not only faster, but also simpler. For example, during the listing phase, the IPO firm must submit only the listing document – that contains useful information for investors, relating to the company's business, economic-financial data and listing operation – and an entire prospectus is not required.

1.3.2 Cons and costs of the IPO process

The limits associated with listing on the stock exchange are perceived by entrepreneurs more or less markedly, depending on the extent of the change that the IPO process entails for their company. Moreover, even if going public definitely brings with it a series of significant advantages, on the other hand the costs are not to be underestimated. Actually, the costs of listing are large and, in Italy, represent for many firms a barrier[14] to the going public decision.

The main limits together with the costs connected to listing on AIM Italia are considered hereafter.

Reduction or loss of control.

A major disadvantage of an IPO is that the founder may lose the control of his company.

Even if a considerable proportion of the quotas can be maintained by original shareholders, as a result of an initial public offering the ownership structure becomes less concentrated, due to

[14] IPO costs on AIM Italia represent a major obstacle for SMEs wishing to go public. In this regard, IR Top Consulting (2018a) has conducted a market research involving the CEOs and entrepreneurs of 22 companies listed on AIM Italia. From this analysis, it emerged that, according to 41% of the interviewed CEOs and entrepreneurs, the costs in the IPO phase are considered as one of the major deterrents to the listing decision.

the dilution effect deriving from the issuance of new shares. In other words, going public increases the dispersion of ownership, which in turn results in a potential reduction or loss of control. In addition, as a consequence of the wider shareholder base and of the greater separation between ownership and control, agency costs are likely to increase.

Disclosure requirements.

Companies that go public are subject to specific and regular disclosure requirements. Unfortunately, these communication practices could play the role of deterrent from listing, even for SMEs considering going public on AIM Italia – where disclosure obligations are less stringent if compared to other markets. In fact, firms may need to publicly disclose confidential information that represent the driver of their competitive advantage (e.g. data on R&D projects or marketing strategies) to potential competitors, suppliers and customers.

Furthermore, disclosure requirements make firms more exposed[15] to the scrutiny of tax authorities (Pagano et al., 1998; Carpenter and Rondi, 2006): not by chance, going public reduces the scope for tax evasion. During the IPO period, the tax burden increases due to the greater visibility of IPO firms to tax authorities; according to Pagano et al. (1996), given Italy's outspread tax evasion, this cost could explain the lower propensity of Italian firms – especially SMEs – to go public.

Commitment and responsibility towards the market.

For a newly-listed company, commitments and responsibilities towards the market matter more than ever before. Time, effort and attention is required from the company and its management. For instance, the board of directors must be ready for a greater openness and transparency, informing the market on the company's financial position and updating investors on the corporate choices aimed at the development of the business (Borsa Italiana, 2013).

Costs.

Finally, the decision of listing is associated to a variety of costs. In particular, the costs that the issuer must bear in order to go public can be grouped into two macro-categories: variable placement costs and fixed advisory costs (IR Top Consulting, 2018b).

Variable costs, defined as a percentage of the total capital raised, refer to the placement of the securities on the market. On the other hand, fixed costs – determined on the base of the company's structure, size and complexity – include the whole set of consultancies necessary to

[15] Directors and employees of listed companies operate in a more rigorous control system, which is subject to greater scrutiny (Borsa Italiana, 2013).

assess the feasibility of the IPO and to support the company during and after the listing process. For instance, fixed costs involve the costs relating to strategic and financial advisory (e.g. the Nomad), administrative and legal practices (e.g. the auditing firm), marketing, initial market entry (e.g. listing fees) and investor relations.

EY (2015) points out a further distinction of costs, categorising them in direct and indirect, where indirect quotation costs include costs linked to the "status" of listed company. In this respect, the services of the investor relator or of internal audit are, among fixed costs, indirect.

Furthermore, the IPO firm is also likely to incur a cost driven by the practice of listing and selling shares at a price lower than the market value: this is the case of underpricing. More specifically, when a new stock closes its first day of trading above the set IPO price, the stock has been underpriced. The underpricing of the IPOs is a particularly significant cost for Italian companies; Carpenter and Rondi (2006) suggest that such phenomenon could be driven by the adverse selection problem, arising from information asymmetries in the Italian financial market.

Indeed, listing on AIM Italia entails limited costs compared to listing on the main market. The costs of going public on this second market are lower because of its greater regulatory flexibility and simpler listing process, but they are not low enough to stop being a deterrent to the listing decision.

Ighini and Tambalo (2016) report that a cost of listing[16] between €400 and €600 thousands emerges for SMEs, after having carried out an analysis of numerous admission documents and interviews with the representatives and advisors of AIM-listed companies. In addition to this cost, placement commissions – equal to 5-6% of the capital raised – must be added. IR Top Consulting (2018a) proposes similar findings[17], registering overall IPO costs between €665 and €760 thousands. Moreover, it should be noted that, as the size of the company being listed increases, the listing costs also increase, since the involvement of a higher number of consultants is required.

Borsa Italiana (2019) provides further details on the costs of listing on AIM Italia, indicating the size of the admission fees. A floor[18] equivalent to €15 thousands (or €25 thousands) is to be paid for companies with a market capitalization[19] smaller or equal to €20 million (or greater

[16] The reported cost of listing is associated to capital collections that on average range between €5 and €10 million.

[17] Similarly to Ighini and Tambalo (2016), IR Top Observatory has estimated fixed advisory costs which, varying according to the complexity and characteristics of SMEs, range between €300 and €500 thousands. As for variable placement costs, the cost estimates linked to €5-€7 million capital raised vary from €265 to €360 thousands (IR Top Consulting, 2018a).

[18] The floor is to be paid in advance upon submission of the application for admission on AIM Italia.

[19] Capitalization is calculated on the base of the offering price.

than €20 million). The cap is fixed at €500 thousands, and a €75 fee is envisaged for every €500 thousands of market capitalisation.

In conclusion, listing on the stock exchange and, in particular, on AIM Italia represents an opportunity for firms from multiple perspectives. However, going public also brings with it some disadvantages that are not to be underestimated – it is not a cost-free process.
Yet, various costs relating to listing are incurred on a one-off basis, allowing permanent access to the market; hence, these costs can be considered as an investment for the medium-long term. Also, some of the disadvantages can be minimised if the company gradually approaches listing, with an adequate preparation at both the structural-organizational and cultural level (Ferragina, 2007).

Chapter 1 has focused its attention on the Italian Alternative Investment Market. An overview of the context within which AIM Italia has developed and of some general data about this growing market has been given. Afterwards, the functioning of the market, in terms of regulation, listing process, subjects involved, has been presented. Finally, attention has been turned to the listing decision, and the advantages that may derive from going public. With this in mind, it is now worth to examine what literature tells about the post-listing effects.

POST-LISTING EFFECTS IN LITERATURE

2.1 Literature Review

The Initial Public Offering (IPO) is a topic that has been widely examined in literature because it represents a turning point in the life of a company, resulting in radical changes in the whole structure of the firm (e.g. in the size of its operations, in the capital structure, as well as in the ownership structure). Theoretical uncertainty characterises the function of the stock exchange and its influence on corporate performance (Alexander and Mayer, 1991; Aiello and Silipo, 1997; Chawla, 2016). On the one hand, academics attribute to capital markets a central role for economic growth, since they provide companies with capital and risk diversification. Also, within the context of asymmetric information of financial markets, a positive signal derives from the fact that stock exchanges contribute to improving corporate information disclosure. On the other hand, capital markets are viewed as a source of distortion of firms' choices, inducing to adopt a short-term perspective in investment decisions at the expense of the long-term investments.

A variety of perspectives has been adopted by scholars in order to deal with this field of study. In particular, research addresses questions about the reasons of going public and about the propensity of making such a critical decision. Why does a private firm engage in an IPO?[20]

[20] The motivation of going public is often inferred through a comparison of the ex-ante and ex-post characteristics of IPO firms with those of private firms. The prestige and enhanced reputation of being publicly listed, together with the public firms' opportunity to raise capital, seem to be primary motives for IPOs (Ünlü and Yalçin, 2018). Listing on the stock exchange constitutes an opportunity to collect equity in order to subsidize external growth through future acquisitions (Belcredi and Gualtieri, 1995; Brau and Fawcett, 2006); but a relatively small portion of funds appears to be used to engage in acquisitions, since the largest fraction is instead used to finance R&D and capital expenditures (Kim and Weisbach, 2008).
According to Paleari et al. (2008), in the European main markets the decision to go public is driven by the firms' need to overcome borrowing constraints, rather than to finance new investments. In contrast, second-tier markets like the AIM are a means to finance growth. Carpenter and Rondi (2006) suggest the existence of two classes of IPOs in Italy. Large companies, part of pyramidal groups, go public to diversify shareholders' wealth, to maximise IPO proceeds and to transfer control, rather than turning to the market for funding and financing growth. In contrast, small and independent firms use the IPO proceeds to meet their capital needs after a period of large investments, to deleverage and rebalance their capital structure. The possibility of accessing to alternative sources of financing is particularly relevant for this kind of companies, which tend to be characterised by significant current and future investments, by high leverage and sustained growth. The same findings are reported by Pagano et al. (1998), once they make the distinction between carve-outs and independent companies. Interestingly, Pagano et al. (1998) also point out that public holdings seem to list their subsidiaries when their economic and financial condition is most promising – when their subsidiaries are most profitable and not highly indebted.

Which variables/firm's characteristics are most likely to affect the decision of going public?[21] Other studies have involved the analyses of the IPO's impact on corporate performance and, in this respect, two main approaches have been considered. Some authors study the stock price dynamics of newly-listed firms, evaluating the degree of the underpricing phenomenon and long-term underperformance[22] (market approach); others investigate the changes in the company from an internal point of view, by looking at post-IPO financial statements, ownership figures and corporate governance mechanisms (business approach).
In addition, it is worth taking notice of the fact that the major research effort in this field has been given to main markets. This is why this paragraph (2.1) refers to the analyses on post-listing effects in literature where IPO is to be intended as an initial public offering made on a main market.

The objective of this chapter is to provide the theoretical basis for the empirical analysis conducted in Chapter 3. From now on, Chapter 2 pays attention to the post-listing effects on firms' performance by following the business approach – disregarding the post-listing effects on the financial markets, since the investigation of the latter is beyond the scope of my work. I am particularly interested in studying the post-listing dynamics in terms of financial-economic

[21] The probability of an IPO increases with size (Aiello and Silipo, 1997; Pagano et al., 1998; Chemmanur et al., 2005). The higher propensity to list of large companies is strictly linked to the need to diversify their sources of financing (in order to reduce the risk of the entrepreneurial activity) and to the need to make large-size investments. Size is also important for the recovery of fixed floatation costs. In addition, Aiello and Silipo (1997) propose that innovative companies, such as those in the high-tech industry – to which a higher riskiness is associated – are more likely to go public than traditional firms. Then, the likelihood of an IPO is also higher when companies face higher interest rates and concentrated credit sources. Age, revenue growth, market share, profitability, capital intensity, cash flow riskiness are all further factors influencing the inclination to an IPO (Chemmanur et al., 2005). Moreover, market overvaluations within the same industry are positively related to the probability of listing: in fact, under these conditions, companies are incentivised to go public in order to exploit mispriced stock and extract value from investors.
Pagano et al. (1998) point out an interesting fact regarding size: even if the size of the company is one of the most important factors that positively affect the decision of an IPO, size is not relevant for the decision of listing carve-outs. This is possibly because fixed costs of listing subsidiaries are partly sunk, borne by the holding.

[22] IPO's underpricing and long-term underperformance refer to anomalous abnormal returns of IPO firms.
Underpricing is represented by high initial returns during the first trading day, when IPO firms 'leave extra money on the table' because the offer price is lower than the first-day closing price. Brau and Fawcett (2006) state that, according to CFOs, underpricing allows to reward investors for taking the risk of the IPO. Also, further reasons for underpricing are to be found in market uncertainty and imperfect information.
Long-run underperformance is represented by negative abnormal returns over the longer horizon; in fact, for several years after the IPO, issuing firms document low stock returns. Actually, the stock of IPO firms underperform if compared to the stock of non-issuing firms. This could be due to the fact that the stock of IPO firms is priced relying on the expectation of a growing profitability, but in reality profit margins do not grow beyond pre-IPO levels.

indicators, like revenue growth, profitability, financial structure, to gain some insights into the effects occurring after firms go public.

Empirical evidence obtained so far does not offer unequivocal results. Surely, the corporate long-term performance depends on the firms' selection of projects and on their ability to generate the expected earnings. Yet, if we consider the post-listing years, the benefits of IPO firms in terms of accounting performance seem to be questionable. In fact, the operating performance of IPOs during the first years after going public appears to be characterised by an evident anomaly: several studies document that the accounting performance of IPOs deteriorates. In this respect, research argues that over time the profit margin does not grow beyond pre-IPO levels thus that after listing companies experience a drop in profitability.

The empirical studies on IPOs presented in the following pages have examined the characteristics of newly-listed companies before and after listing; competing theories exist when it comes to focusing on the analyses of the effects of listing. Before illustrating the numerous authors who have dealt the topic and their findings, it is interesting to point out three considerations[23]. Firstly, one common aspect of the examined papers regards the sample identification: the great majority of studies exclude from the sample firms belonging to the banking and financial sectors, exclusively considering industrial non-financial companies. Secondly, the quotation years in question range from 1971 to 2004, hence the analysed data regards the last three decades of the twentieth century. Lastly, the countries which have been subject of study are the following: US, UK, Italy, Japan, Australia, China and Thailand. In literature, studies on the post-listing effects in developed economies do prevail if compared to those in emerging markets; yet, two papers mentioned in the following pages regard post-listing effects in emerging markets. Anyway, also in this case, the main finding is in line with that of the other studies: performance undergoes a significant deterioration after the IPO. These specifications suggest a certain degree of completeness in the studies involving quotations on main markets, in terms of time frame and geography, as well as a shared view when it comes to identifying which companies it is worth to examine.

Theoretical uncertainty characterises the analyses of capital markets' effects on the performance of newly-listed companies. Jain and Kini (1994) are the first to examine the operating performance of IPO firms in the US. They suggest that the companies involved in an IPO transaction experience a substantial decline in post-listing operating performance, especially if the year immediately following the listing is compared to the pre-IPO levels. The

[23] For further details view Table 2.1 at the end of paragraph 2.1.

authors come up with such outcome by assessing over a six-year period the following variables: operating returns on assets, operating cash flows, growth of sales, asset turnover, capital expenditure. The median operating return on assets and operating cash flows of IPO firms decrease in the quotation year and keep on worsening for a few more years, while the corresponding industry-peers either exhibit stable patterns or decrease to a smaller extent. This means that the underpeformance is not to be attributed to a decline of the profitability of the industries in question. Simultaneously, the newly-listed firms experience high revenue growth and capital expenditures; thus, the decline in post-issue operating performance is also not to be imputed to the absence of growth opportunities or to a reduction of capital expenditures.

Inability to sustain pre-IPO levels and declining profitability, despite the high post-listing revenue growth and capital expenditures, is also verified by Mikkelson et al. (1997), Chemmanur et al. (2005) and Ali (2017). In this respect, Chemmanur et al. (2005) document that sales and capital expenditures show a monotonic increasing trend before and after the IPO, but that the growth in sales is subject to an inverted-U shaped pattern. This implies that the peak in sales growth is experienced in the year of the IPO and that following the IPO sales growth decreases, consistently with the model of Clementi (2002)[24]. Paleari et al. (2008) argue that the implication of this finding suggests that IPOs are not used to execute valuable new investments and as a springboard for internal growth strategies.

Mikkelson et al. (1997) state that the accounting performance – measured as operating income on assets or on sales – of US IPO firms outperforms the one of industry-matched peers during the year prior to listing and drops below the level of industry-matched peers during the first ten post-listing years. The median operating income of IPO firms, adjusted for industry effect, is 9 cents per dollar of assets in the pre-IPO year and becomes a negative 2 cents per dollar in the post-IPO year. Yet, the decline in profitability limits to the first year and does not drop further in the following years.

The paper identifies in age and size two factors that primarily affect the post-IPO change in operating performance. In other words, the degree of variation in operating performance around the IPO varies greatly between companies of different age and of different size. Interestingly, the authors find out that the worsening of the operating conditions is especially present in the younger and smaller firms[25] and slightly less visible in the older and larger-size companies. In

[24] Clementi (2002) creates a model to explain the dynamic pattern of the various variables prior and after the IPO. The author proposes that the above-mentioned patterns are consistent with the performance implications of a company that increases its scale of operations around the offering.

[25] Mikkelson et al. (1997) suggest that the worsening of the operating conditions is more visible in young and small companies because of the low sales volume, high operating costs and aggressive pricing strategies that tend to characterise these firms.

addition to confirming that listed companies experience a worsening of the post-listing economic and financial indexes, Mikkelson et al. (1997) note that the listed firms of their sample experience an extremely promising performance in the year before going public.

As for Japan, poor post-IPO performance is confirmed. Cowling et al. (2002) examine the performance of Japanese newly-listed companies, from five years prior- to four years post-going public, and a significant decline in the post-issue accounting performance is reported. They also investigate the growth patterns of net sales, ordinary profits and net profits, and point out that all three growth rates are sharply reduced after the offering. Furthermore, similarly to Mikkelson et al. (1997), Cai and Wei (1997) document that Japanese IPOs report peaking profitability levels in the year prior to going public and a deterioration of performance immediately after the IPO.

In the Italian case, profitability seems to reduce after the IPO and, in general, also investments and financial leverage decrease (Pagano et al., 1998). These effects keep being persistent after the first three years from the quotation date. More specifically, the years immediately after going public witness a significant decrease in profitability: from a decline of -1.5% in the first post-IPO year to -3% in the third post-IPO year. Distinction being made between independent companies and carve-outs, the former experience a decrease[26] of leverage and a significant contraction of investments, while the latter also undergo a drop in leverage but a temporary rise in investments.

An interesting intuition is proven in this study: newly-listed firms are subject to a permanent increase in tax pressure. In fact, IPO firms pay 2% more taxes per year if compared to before listing (as a fraction of operating income). This is probably because the stricter transparency and disclosure requirements associated to going public prevent, to a certain extent, tax evasion. Moreover, Pagano et al. (1998) are also the first to report the lower cost of credit experienced by Italian companies after listing. Cheaper borrowing, which is stronger for independent companies than for carve-outs, is a statistically and economically significant post-listing effect in the IPO year and in the three post-IPO years – then, this effect starts weakening. The authors point out three motivations explaining the lower cost of credit. Firstly, this contraction in the cost of credit can be associated to the enhanced information disclosure imposed to IPO firms, which makes it less challenging for potential lenders to assess their creditworthiness. Secondly, it may be due to the IPO firms' stronger bargaining position with banks (since IPO firms can more easily recur to sources of financing other than bank loans). Thirdly, the lower leverage of

[26] When new shares are issued, leverage decreases because of the equity capital inflow that is raised. Everything else kept equal, the decrease in leverage is higher, the higher the percentage of equity issued at the offering and the greater the proportion of primary over secondary shares is.

IPO firms makes them a safer borrower and justifies cheaper borrowing. Thus, it is no surprise that, after going public, companies lower the concentration of their borrowing by relying on a higher number of banks willing to lend.

Furthermore, Kim et al. (2004) are the first to examine the performance of newly-listed firms in an emerging market. They conduct an analysis comparable to the one of Jain and Kini (1994) and come up with similar trends – increasingly low operating return on assets and operating cash flows after the IPO, which cannot be explained by the levels of sales growth and capital expenditures. However, they discover that the magnitude of the decline in post-issue performance in Thailand is much greater if compared to that in the US. For instance, three years after the IPO, return on assets of Thai firms is 70% lower than that reported in the year pre-quotation (compared to a 9% decline of the same measure in the US).

Also China documents a decline similar to the one of Thai IPO firms and much greater than the one of US IPO firms. In fact, the median profitability of Chinese IPOs is about one-third lower three years after listing than three years prior to listing (Wang, 2005). The sharp drop in post-issue operating performance of Chinese newly-listed firms persists both before and after industry adjustments. The comparison of the pre- and post-IPO levels of return on assets shows a 31% decline from three years before to three years after listing and a 20.9% decline from one year before to one year after listing. The same figures after industry adjustments turn to be incredibly high, 90% and 61% three years and one year after listing, respectively.

In addition, Wang (2005) confirm that the decline in post-listing performance is in no way related to the underpricing phenomenon. More specifically, underpricing is not useful to explain and predict the operating performance of IPO firms; such outcome – in line with the findings of Jain and Kini (1994) – is implied by proving that the most underpriced IPO firms do not outperform the least underpriced IPO firms.

Finally, a more recent paper studies the post-listing effects of Turkish IPO firms in an innovative way[27] and still confirms findings consistent with those of the previous authors (Ünlü and Yalçin, 2018).

Consequently, it is possible to claim that the aforementioned studies find evidence of a decline in the post-issue operating performance of IPO firms, both before and after industry adjustments, both in emerged and emerging markets.

[27] Ünlü and Yalçin (2018) assess the post-listing performance of newly-listed companies through a multi-criteria evaluation: they do not only consider the accounting-based performance measures but also investigate the value-based performance measures (i.e. economic value added market value added, cash flow return on investment, cash value added and refined economic value added).

As for research built on the comparison between stock exchanges in different countries, two studies are worth mention: Paleari et al. (2008) and Carpenter and Rondi (2006).

The size of the equity markets in UK and Italy is very different[28], yet Paleari et al. (2008) believe that a comparison between these two provides further insights into the differences between Anglo-Saxon markets, on the one hand, and the markets of Continental Europe, on the other hand. Their finding, which is valid for both London's and Milan's stock exchange, suggests that after the IPO there is no significant change in the level of capital expenditures and in the growth rate of sales – differently from the aforementioned literature. In addition, post-listing operating underperformance is testified by a permanent and significant drop in profitability, measured in terms of return on assets and return on equity. However, if cash flow return on assets is considered, the decline in profitability persists but is no more significant.

Moreover, while the IPO on the LSE often results in a rebalanced capital structure, the IPO in Italy – in line with previous studies – only temporarily deleverages the companies. This is because the Italian companies following the IPO can recur to further debt capital at a lower interest rate. Such result suggests that, while the reduction of debt exposure for companies listed on the LSE is permanent and the IPO is a means for rebalancing their financial structure, in Italy the stock exchange is a source of capital exploited when other sources (e.g. bank financing) are too expensive. Thus, in the two countries a relatively different perception of the stock exchange's role is evident, which to a certain extent also reflects in the characteristics of newly-listed companies: in Italy the firms that go public are larger and older compared to their English counterparts.

In the same way, in Italy the firms that go public are larger and older also compared to their US counterparts. In fact, Carpenter and Rondi (2006) report that Italian IPO firms are larger in terms of sales, total assets, employment and that they tend to be quite old when going public (the median age is 23). This paper aims to investigate the consequences of listing in Italy and in the US, paying a particular attention to growth outcomes. The growth rates of total assets, fixed capital and sales of Italian companies are positive, both before and after the IPO; but if compared to the growth rates of US companies they are extremely small. On average, after going public US IPO firms grow rapidly while Italian IPO firms exhibit slower growth rates. This finding is not linked to the greater initial size of Italian IPO firms, because it persists when only large-size comparable US firms are considered – also in this case, growth rates of US IPO firms are twice as large. Yet, the paper points out that going public has a positive impact on the

[28] As of the end of 2018, the English market capitalization is four times higher than that of Italy (Source: World Federation of Exchanges database).
<https://www.indexmundi.com/facts/indicators/CM.MKT.LCAP.CD/rankings>

Italian small and independent firms, which seem to use the listing on the stock exchange as a means for growth.
Hence, in general, listing in Italy does not guarantee a faster growth. According to Carpenter and Rondi (2006), policy makers should not only facilitate the access to capital markets but also provide incentives for the IPO firms to use the raised capital to grow.

Further scholars focus their attention on the comparison of listed and non-public companies, comparable by industry sector and size. These studies aim to verify whether the status of listed company is related to differences in performance and financial structure compared to the status of unlisted company.
A first study in this direction is conducted by Alexander and Mayer (1991) who, by comparing English listed and unlisted industrial companies in the eighties, highlight that listed companies invest more and grow faster. The more rapid growth of English listed firms is measured in terms of sales, employment and investment. Yet, the authors point out that such outcome is attained mostly through acquisitions rather than being imputed to an organic growth. Also, on average, listed firms are more profitable than their unlisted counterparts. The profit margin of both types of companies is subject to an increase in the analysed period, but the profit margin of listed companies keeps being appreciably higher (a 40% difference is recorded with respect to unlisted companies). As for the financial structure, listed firms finance themselves by raising more equity capital or through medium- and long-term loans; instead, unlisted firms tend to invest retained profit or to raise short-term loans. Hence, the English quoted and unquoted firms seem to be characterised by a diverse financial structure.
Alexander and Mayer (1991) conclude that the performance of listed companies is impressive compared to that of their unlisted counterparts: data show that listed firms outperform unlisted ones. Therefore, the authors presume that there is no evidence in favour of the hypothesis that the stock exchange, or being listed, has a negative effect on corporate performance. Conversely, the access to capital markets for British companies seems to be beneficial for their performance. However, the same conclusion is not true for Italy. The existence of statistically significant differences between companies newly-listed on the Italian stock exchange and unlisted firms is firstly verified by Belcredi and Gualtieri (1995): listing on the Italian stock exchange does not seem to accelerate and encourage growth. They discover that the sales of listed companies do not grow to a greater extent than those of unlisted companies; the post-IPO change in tangible and financial fixed assets is recorded to be higher for listed firms and this is attributable to external growth operations. In addition, their analysis testifies a significantly higher profitability (measured as return on sales) of listed companies only in the period immediately

preceding the listing and in the year immediately following the listing. In this respect, the paper points out the Italian companies' inclination to undertake the listing process in correspondence of their peak economic results, with the aim of maximizing their stock offering price. As for leverage, listed companies seem to be characterised by a more balanced financial structure; however, the reduction in leverage is only temporary. In fact, it emerges that at the IPO Italian firms rely on capital increases to improve their financial structure, but that following the IPO listed companies resort to debt more than unlisted companies – increasing their long-term debt again and returning to a ratio between long-term debt and equity that is similar to the one of the pre-IPO period.

Also the subsequent Italian studies contradict the findings of Alexander and Mayer (1991) on the quoted firms' higher growth and higher profits.

Pagano et al. (1996) suggest that in the period following the listing listed companies are subject to a reduction in profits, investments and leverage. For instance, they propose that the return on investment for listed companies exceeds the one of unlisted companies only in the pre-IPO period. The authors highlight a lower post-IPO revenue growth of listed companies compared to unlisted ones together with an increase in the interest of credit institutions to work with newly-listed firms. Interestingly, they also verify that newly-listed companies do pay more taxes if compared to private companies, especially from the IPO period onwards.

Aiello and Silipo (1997) suggest that capital markets play a role in improving the productive efficiency of enterprises. They state that, in the analysed period, listed companies show higher levels of productive efficiency but not of profitability with respect to unlisted companies. In fact, listed companies are generally more efficient in that their productivity levels per employee are almost twice those of unlisted companies. On the other hand, the return on investment is lower for listed companies. Hence, Aiello and Silipo (1997) imply that the greater productive efficiency that characterises the listed companies in their sample is not sufficient to determine a greater overall profitability of these companies.

Finally, Bonaccorsi di Patti (1999) claims that the growth of unlisted companies is greater than that of listed companies, in terms of revenues, value added and fixed assets. For instance, the unlisted firms' growth rate of total revenues is more than double if compared to the same growth rate for listed companies. Moreover, the author reports that the profitability of unlisted companies is no different from the profitability of listed companies. In fact, the average profitability of unlisted firms is higher – more than double – in terms of return on assets but lower in terms of return on sales.

Thus, from the above-mentioned studies, it is clear that substantial differences exist between listed and unlisted firms. Findings on growth and profitability are not always consistent in

literature. While the stock exchange is seen as a growth engine in the Anglo-Saxon markets, the same does not apply to the Italian market where a financial role of the stock exchange emerges. Overall, non-conflicting findings are found regarding the financial structure of listed versus unlisted firms: both the English and Italian studies find out that unquoted firms are characterised by a greater orientation towards short-term loans.

The literature presented so far has focused on the economic-financial aspects of listing on the stock exchange. Putting aside the studies that merely pay attention to the post-listing operating performance, another interesting research focus that is worth to mention relates to the investigation of post-IPO changes at the managerial-ownership level. Clearly, going public increases the dispersion of ownership: even if a considerable proportion of the quotas can be maintained by substantial[29] shareholders[30], as a result of an initial public offering the ownership structure becomes less concentrated, due to the dilution effect deriving from the issuance of new shares. Consequently, the monitoring of management by shareholders tends to decrease and the incentives of managers could potentially worsen.

There is a long tradition of research regarding the relation between ownership and corporate performance. Ownership seems to play a role in explaining the underperformance of newly-listed firms, yet evidence is not conclusive.

A positive relation between the proportion of ownership retained by original shareholders and variations in performance is proposed by Jain and Kini (1994). A positive relation implies that the higher the proportion of shares retained by pre-listing owners, the lower the decline in the operating performance from before to after the IPO; in other words, this means that IPO firms where a higher degree of ownership is retained are subject to superior operating performance. More specifically, firms characterised by high ownership retention – if compared to firms characterised by low ownership retention – enjoy a significantly superior operating performance in each of the four post-listing years[31], relative to the pre-listing year. On the other hand, these results are rejected by Mikkelson et al. (1997), who find no relation between changes in ownership during the IPO period and operating performance.

[29] Substantial shareholders own 5% or more of total outstanding shares.

[30] Paleari et al. (2008) state that in Italy, before going public, 96.6% of the shares are held by substantial shareholders and, after the issue, 60% of shares remain in the same hands. As for the management team, literature reports that managers, following an IPO, continue to hold a significant amount of shares or, alternatively, that they are provided with substitute incentives (for instance, with compensation through stock options).

[31] Superior operating performance, measured in terms of operating cash flow and sales growth, is recorded (even after industry adjustments are made) in years 0, +1, +2, +3, relative to year -1 – where year 0 is the listing year.

Mikkelson et al. (1997) do not only point out that corporate performance is in no way correlated to the evolution of the ownership structure. In particular, Mikkelson et al. (1997) analyse the relationship between the change in managerial ownership over 10 post-listing years and the operating performance of newly listed companies. They suggest that changes in the ownership structure resulting from the IPO[32] do not lead to changes in incentives, because managers continue to hold substantial stake in the firm and thanks to stock-based compensation mechanisms. Hence, this study rejects interests-misalignment between managers and shareholders.

Similarly to Mikkelson et al. (1997), also Cai and Wei (1997) report a non-significant relation between ownership and variations in performance[33]: the operating underperformance (e.g. decline in profitability) of high managerial ownership firms is not significantly different from that of low managerial ownership firms.

The findings of Cowling et al. (2002) contrast with those of Cai and Wei (1997). In addition to age and size, also the managerial ownership structure is found to contribute to the firms' operating performance pre- and post-listing; a reduction in managerial ownership drives a deterioration of the post-listing operating performance, by potentially increasing agency costs. In fact, the top shareholder's ownership stake influences positively and significantly the growth rate of net sales and the growth rate of profits. When the top shareholder decreases its ownership post-listing, performance results are inferior (the very same relationship is found to exist also for the top 10 shareholders' ownership[34]). In this direction, another interesting contribution is made by Balatbat et al. (2004), who study the relation between the ownership structure of Australian IPOs and operating performance, for up to 5 years post-listing.

Balatbat et al. (2004) state that ownership[35] is subject to a monotonic decrease during the 5 post-IPO years. Such decrease is more evident during the first post-listing year, indicating that owners prefer to exploit investors' overoptimism and divest immediately after the IPO. Moreover, this study claims that a significantly positive relation between insider ownership and operating performance exists, but only for the fourth and fifth post-listing year. In other words,

[32] Managerial ownership declines from 67.9% pre-IPO to 43.7% immediately after listing, 28.6% five years after listing and 17.9% ten years after listing.

[33] The authors suggest that, perhaps, such conclusion could be due to the peculiar legal and regulatory environment of Japan, which gives firms a larger freedom to own shares and exercise control, hence controlling for agency costs.

[34] Cowling et al. (2002) report the following data on ownership stakes. After the IPO, the top shareholder's stake diminishes from 29.82% to 22.87% and the top 10 shareholders' stake diminishes from 80.54% to 63.70%. Yet, despite this decrease, it is clear that ownership is still concentrated one year after the offering: the top 10 shareholders continue to hold considerably large stakes.

[35] 5 years post-listing, managerial ownership equals 28% and the top 20 shareholders hold about 80% of total shares.

the statistically significant impact of ownership on performance is not immediate[36]. The late recognition of this relationship may be explained in two ways: firstly, the relation could become visible only after the companies with the most fragile prospects have already failed; secondly, an upward manipulation of earnings during the 3 post-listing years could confound the attempts to observe an existent underlying relation.

Furthermore, a non-linear relation between the proportion of ownership retained by original shareholders and variations in operating performance is first documented by Kim et al. (2004). The authors state that companies with a high or low degree of ownership retained show a positive relationship between ownership and operating performance, while the opposite is true for companies with a medium degree of ownership retained. In a similar way, also Wang (2005)[37] documents a curvilinear relationship between ownership (and concentration of ownership) and variations in performance.

To recap, according to most pieces of research, a positive relation between ownership and performance appears to exist and the decline in managerial ownership post-IPO explains the drop in profitability. Then, with this in mind, the size of the ownership stake retained could be seen as an effective means to align the incentives of managers and shareholders. Some relatively more recent studies propose a non-linear relation between the proportion of ownership retained by original shareholders and variations in operating performance; instead, according to others, no relation at all exists. Thus, overall, evidence on the relation between ownership and corporate performance is not conclusive.

The common ground behind the above-mentioned empirical contributions is the tendency towards a significant worsening of the operating performance of newly listed firms, testified by analyses conducted on the main financial indexes and ratios. Yet, this trend of underperformance is in literature one of the least explained regularities. Several theoretical explanations to justify this anomaly have been provided, but it is challenging to identify the exact motive for a decline in post-IPO operating performance. The reasons proposed by various scholars, starting from Jain and Kini (1994), to justify this phenomenon are attributable to:

1. the willingness and ability of management to choose the right timing for the quotation;

[36] The statistically significant impact of ownership on performance is not present in the first 3 years post-listing.

[37] Wang (2005) studies the Chinese listed firms' operating performance around the IPO period, trying to reveal the relationship between ownership and performance. In this particular paper, for ownership, non-state ownership is intended: that is, in other words, legal-entity ownership (e.g. shares held by domestic institutions, like listed firms or financial institutions).

2. window dressing practices prior to listing, in order to obtain higher growth expectations and a better pre-IPO assessment;
3. the increase in agency costs due to the greater separation between ownership and control.

1. The first explanation concerns the timing of the offering. The authors claim that the initial public offering takes place in a moment of very positive operating performance. It is then possible that the decline is not linked to the offer itself but that it is physiological to the firm's lifecycle, since the company made its going public decision when experiencing a peak in its economic-financial performance, which is clearly not possible to sustain in the future (Akhigbe et al., 2006).

The timing of going public does not only take in account the favourable corporate conditions but also promising market conditions[38]. For instance, an overvaluation of comparable companies[39] in the same industry or a reduced scrutiny of investors may incentivise a private firm to go public: such practice of taking advantage of market optimism, in periods of generally high stock prices, is referred to in literature as 'windows of opportunity'[40]. However, the practice of timing the going public decision under these circumstances (in periods of high industry valuation) signals unfavourable future industry conditions. In fact, it is not surprising to observe poor stock performance after periods of high optimism or high volumes issued (Ali, 2017).

2. The second reason consists in the so-called window dressing practice, which makes the firm shine or, in other words, ameliorates the appearance of a firm's financial statements prior to listing – in order to obtain a better stock price. This manipulation misleads investors by providing them with more favourable pre-IPO accounting and financial results: an overestimation of the pre-IPO operating performance, followed by an underestimation post-IPO.

From a practical point of view, window dressing depends on the discretion of managers in preparing financial statements and can be implemented in several ways. For instance, these are: reporting earnings from other periods by deferring expenditures in R&D; capitalising instead of expensing current costs; allocating costs over longer periods by means of straight line

[38] The stock market and industry conditions are found to be the two most important determinants of IPOs' timing. The idea is the following: in prosperous periods for the industry, when market valuations are high, companies exploit the favourable timing by issuing public offers.

[39] When comparable firms are characterised by high multiples, IPO valuations are positively affected by such multiples (IPO companies are able to attain high valuations and offering prices). For this reason, private companies are incentivised to go public under these conditions.

[40] Data (Brau and Fawcett, 2006) confirm that CFOs exploit the so-called 'windows of opportunity'.

depreciation, rather than through accelerated depreciation. In this respect, it is useful to note that earnings management involved in the window dressing hypothesis is not applicable to cash flows. Hence, the lack of a decline in cash flow profitability, coupled with underperformance of accrual-based measures of operating performance, could signal a manipulation of earnings (Paleari et al., 2008).

Thus, this creative accounting, which relies on discretionally managing accruals and other accounting numbers to make the firm shine, is ultimately implemented to achieve the managers' best interests.

3. Finally yet importantly, the decline in performance could be explained by an increase in agency costs after the public offer. In other words, a partial explanation of the worsening of a company's operating performance is to be identified in a change of incentives, which is due to a lower concentration of ownership in the post-IPO period. Therefore, conflicts of interests and information asymmetries emerge and, following an IPO, increase. Information asymmetries take the form of moral hazard and adverse selection.

In general, the management is delegated to experts (agents) because shareholders (principals) do not possess the skills, information and time necessary to run the firm. Moral hazard incentivizes managers to run the business to their personal advantage (taking suboptimal decisions in order to maximise their own benefits) and to the minority shareholders' detriment, resulting in increased agency costs. In this respect, an IPO may enlarge agency problems even more because of the dispersion of managerial ownership. It is documented in literature that companies with a low level of post-IPO ownership of managers experience a drop in their performance and this drop in performance is the more relevant the lower the share of ownership. Conversely, high post-IPO managerial ownership incentivizes managers to undertake value-maximising projects.

On the other hand, adverse selection causes companies to go public at the peak of their performance, right when profitability is about to begin to fall. Then, adverse selection implies a positive correlation between the stake retained by pre-IPO owners and post-IPO operating performance. The adverse selection problem occurs due to the information asymmetry existing between issuers and investors (issuers possess an informational advantage over new investors), and this phenomenon could play a role in the decline of the operating performance and adversely affect the success of the IPO (Pagano et al., 1998). In this regard, it seems that the most disadvantaged firms are younger, smaller and less known.

In conclusion, post-listing operating underperformance is not generated solely by one of the three hypotheses mentioned above. One hypothesis does not exclude the others, they are not mutually exclusive. Indeed, some authors privilege one explanation and disfavour another, but

all three have raised in literature equal attention of researchers, since all three are equally valid and plausible. Therefore, it is difficult to know if one of the three, in particular, is the determinant cause of underperformance.

Some studies have mentioned potential reasons for underperformance in absence of artefacts. For instance, poor post-issue operating performance could be attributed to a decline in the profitability of the industry in question and to the absence of revenue growth opportunities, or could be explained by IPO-specific conditions. More specifically, reasons for post-IPO underperformance could be linked to: the real investment effects of going public; the inefficient use of the proceeds deriving from listing; the lack of ability to generate the pre-listing levels of positive net present value projects and to manage growth; the post-listing reduction in capital expenditures below the adequate level (Jain and Kini, 1994; Kim et al., 2004; Chemmanur et al., 2005; Akhigbe et al., 2006).

However, these further reasons are not widely supported and the other three prevail instead.

Theory attributes numerous virtues to capital markets, the most important of which is increasing the sources of financing and, therefore, the opportunities of growth for listed firms. Also, the stock exchange performs specific functions like risk diversification and the transfer of control, which indirectly promote efficient resource allocation and growth.

The effects of listing derive from a greater visibility of the listed company and can be of opposite sign. On the one hand, visibility translates into increased scrutiny and therefore could reduce agency costs and improve performance; on the other hand, it could push managers to adopt a short-term perspective and maximize variables such as size or accounting profits – to maximize the value of shares – at the expense of long-term growth (Aiello and Silipo, 1997; Bonaccorsi di Patti, 1999). Thus, some academics view going public as a positive event in the firms' life cycle, while others object to such a decision by pointing out a series of potential drawbacks linked to the IPO.

The above paragraph has explored the various analyses performed in literature on capital markets' effects on the performance of newly-listed companies. In doing so, some pieces of research have focused their attention on the comparison between stock exchanges in different countries, others on the comparison of listed and non-public companies. Some other studies have also investigated the post-IPO changes at the managerial-ownership level. Then, to recap, Table 2.1 reports below a list of the papers presented in this paragraph.

Table 2.1: Literature Review

Authors	Country	Quotation Years
Alexander and Mayer, 1991	UK	1980-1987
Jain and Kini, 1994	US	1976-1988
Belcredi and Gualtieri, 1995	Italy	1985-1990
Aiello and Silipo, 1997	Italy	1992-1995
Cai and Wei, 1997	Japan	1971-1992
Mikkelson et al., 1997	US	1980-1983
Pagano et al., 1998	Italy	1982-1992
Bonaccorsi di Patti, 1999	Italy	1992-1996
Cowling et al., 2002	Japan	1995-1996
Balatbat et al., 2004	Australia	1976-1993
Kim et al., 2004	Thailand	1987-1993
Wang, 2005	China	1994-1999
Carpenter and Rondi, 2006	Italy and US	1977-1997
Paleari et al., 2008	Italy and UK	1995-2004

Source: Personal elaboration

To conclude, the majority of authors seem to witness underperformance of the operating results: firms appear to perform poorly following the IPO. The studies presented report a significant decline in the post-issue profitability of IPO firms, with respect to their pre-issue level, both before and after industry adjustments. No matter whether developed or developing countries are considered, such a puzzling regularity seems to persist. In addition, this underperformance of IPOs appears to be a global phenomenon. Yet, this result is not necessarily linked to worrying firm conditions, such as earning management practices, but could be viewed as the consequence of long-term looking growth-enhancing decisions (e.g. investments in R&D).

2.2 Research involving the Alternative Investment Market

As presented in the first part of the chapter, IPOs have widely raised the interest of academics and, within this field, a major research effort has been given to main markets. Nevertheless, companies that go public on second markets have received relatively little attention from the empirical literature; in fact, studies involving second markets and in particular the post-listing effects of IPOs made on second markets are less frequent. The following pages aim to provide an overview of the scarce literature dealing with second markets and, for the sake of my dissertation, with Alternative Investment Markets.

To begin with, it is worth recalling that second markets are usually arranged to satisfy the financing needs of specific classes of firms that do not meet the eligibility requirements of main markets (Paleari et al., 2012). Thanks to a less stringent regulatory regime, second markets have attracted a growing number of companies, thus their success is testified by data. For instance, in the years 1995-2009, out of the 3755 IPOs made on the stock exchanges of the four largest European economies (Germany, UK, France and Italy), 2910 IPOs were made on second markets.

Indeed, most stock exchanges are structured into segments: a main market and one (or more) second markets. Paleari et al. (2012) describe three models for second markets: the sequential segmentation model, the sectorial segmentation model and the demand-side segmentation model.

According to the sequential segmentation model, the second market provides SMEs with the funds necessary to grow and is a feeder to the main market (because whenever SMEs are successful, they transfer to the main market). This kind of second market was successful in the nineties and an Italian real-world example was represented by the Mercato Ristretto.

Secondly, the sectorial segmentation model applies to the New Markets emerging in the late-nineties and granting admission only to firms in the high-tech industry. This type of markets, such as the Italian Nuovo Mercato, was closed after the crash of the internet bubble.

The demand-side segmentation model for second markets is the most successful and is linked to AIM. Markets within this segmentation model are exchange-regulated markets, meaning that they are unregulated or not officially regulated. In exchange-regulated markets, when the IPO does not take the form of a public offering but is instead meant for institutional buyers, the company's prospectus is not required nor it must be approved by national listing authorities. Hence, minimal regulatory requirements and independence from national listing authorities enables companies to list within a limited period of time.

It is intuitively clear that the main market and second markets attract companies with differing characteristics.

Generally, firms going public on second markets are smaller and younger; but this statement must not be accepted as an absolute truth because differences exist on the base of the models for second markets. Yet, the previous statement holds if a comparison is made between firms listing on exchange-regulated markets versus the main market. In fact, Paleari et al. (2012) present the descriptive statistics, by listing market, of a sample of European companies at IPO:

IPO firms on the exchange-regulated market of Borsa Italiana appear to be smaller in size of sales and assets and younger than their counterparts on the Italian main market[41].

Khurshed et al. (2003) and Doukas and Hoque (2016) analyse IPO firms in the UK, comparing AIM UK to the Official List of the London Stock Exchange, and come up with similar findings: firms listing on the AIM are smaller, younger and less profitable[42], despite the firms' industry classification in the two markets being uniformly distributed.

Prior to the IPO, the two classes of firms register close debt ratios – long and short term debt over total assets – and firms on the main market invest more, in terms of capital expenditures over total assets (Khurshed et al., 2003).

Furthermore, the pre-IPO ownership level is similar in the two markets, with around three quarters of the pre-IPO equity held by the top four stockholders. However, ownership varies significantly in the post-IPO period: while the control of firms listed on the AIM is maintained in the hands of the existing shareholders by retaining the majority of shares, the ownership level of companies going public on the Official List is subject to a higher degree of dilution[43] (Khurshed et al., 2003).

The AIM and the main market address to some particular categories of firms with differing characteristics (e.g. size, age, profitability) and dissimilarities in their post-IPO financing and investment priorities. Not surprisingly, the motives that drive the decision of listing on one market or on the other are influenced by firms' characteristics[44], thus vary significantly between the two markets.

Firstly, nearly half of the firms[45] quoted on AIM UK would meet the necessary requirements for listing on the main market (Doukas and Hoque, 2016): thus, the choice of the stock exchange does not uniquely depend on the listing regulatory requirements.

According to Khurshed et al. (2003), the determinants of the going-public decision are inferred from the capital expenditure behaviour post-listing: in the case of AIM, capital expenditures[46]

[41] Data of IPO firms on the exchange-regulated market versus the main market of Borsa Italiana are the following: median sales (€million) 16.7 vs 147.6; median assets (€million) 28.9 vs 162.5; median age (years) 12 vs 31.

[42] Doukas and Hoque (2016) report that companies registering higher sales or higher profitability have a lower probability of listing on the AIM. Profitability measures considered by Khurshed et al. (2003) are the following: ROA, CFROA, ROE and ROS.

[43] Existing shareholders divest more on the main market than on AIM, potentially losing the control of the IPO firms: the ownership level of companies going public on the Official List falls by about 34%.

[44] AIM companies are not suited for the main market because they have different characteristics; in the same way, companies on the Official List are not suited for the AIM (Doukas and Hoque, 2016).

[45] In the years 1995-2014, 49.5% of the 1143 IPOs made on the AIM could go public on the main market.

[46] Measured as capital expenditures over total assets.

increase after the IPO – on the contrary, the opposite occurs on the Official List. Consequently, the AIM appears as a means to raise further funds to finance firms' capital needs, valuable new investments and growth, at a lower cost. Indeed, the AIM's lower admission, on-going and issuance costs also contribute to the decision of smaller and younger firms to list on AIM. On the other hand, going public on the Official List is conceived as a manner to rebalance the capital structure of companies. In addition, since firms on the main market are frequently engaged in M&A activities post-listing, the Official List attracts companies aiming to create liquid shares to be used in future acquisitions (Doukas and Hoque, 2016).
Finally, as previously mentioned, companies on the AIM are characterised by a higher ownership concentration; so also control considerations could play a relevant role for small and young firms in the decision of going or not going public on the main market (Doukas and Hoque, 2016).

A central issue concerns the effects of going public on a second market, and in particular on the AIM. Although considerable research effort has been given to the post-listing effects of IPOs made on main markets (view paragraph 2.1), less attention has been paid to the performance of firms newly-listed on a second market. In fact, literature studying second market IPOs and their impact on corporate performance is not frequent. The findings of such studies, despite not being numerous, are presented below: they are worthy of mention because they provide some theory and interesting food for thought, for the analysis conducted in Chapter 3.

Firstly, Paleari et al. (2012) study the post-listing performance of IPO firms in relation to stock price dynamics. Adopting a market approach, a poor long-run stock price performance of second market IPOs and an even worse performance of exchange regulated market IPOs is reported. In particular, a significantly poor performance of AIM UK IPOs compared to the IPOs on the LSE's Official List is registered[47]. Such outcome can be explained by investors' scepticism about returns to be expected from companies listed on markets with a less stringent regulatory regime.

However, in practice, the delisting rates registered on second markets are not much different from those registered on the main market: the probability to delist differs mostly between two

[47] The stock price performance is measured in terms of the buy-and-hold abnormal returns. Paleari et al. (2012) point out a three-year average buy-and-hold abnormal return for second market IPOs and main market IPOs of -19% and +12.3%, respectively. In particular, as for the LSE, the three-year average buy-and-hold abnormal return for AIM IPOs and Official List IPOs is of -27.5% and +25.3%, respectively.

different countries rather than between market segments (Paleari et al., 2012). For instance, the delisting rate is lower in Continental Europe – in Italy (27.1%) and Germany (25.2%) – than in the UK (52%); this might be due to differences[48] in the regulatory regimes and to the different nature and characteristics of firms listing in Continental Europe, if compared to firms listing in the UK.

Similar results on the survival profile of IPO firms are highlighted by Nielsson (2013) and Revest and Sapio (2014). In the period 1995-2004, 10.7% of the quoted firms delisted from AIM UK within five years from the IPO, for voluntary or administrative reasons[49]. The authors also report that larger and older companies supervised by reputable Nomads show even lower failure rates; in fact, a Nomad's good reputation influences the survival rate of businesses, increasing such rate by two years on average. Ultimately, the authors claim that the delisting pattern across markets is similar, thus suggesting that the failure rate of AIM firms is not higher than the one of firms listed on a more regulated market.

In contrast, the above-mentioned findings differ from the conclusions of Gerakos et al. (2013), who study the survival rate of companies listed on AIM and compare it with that of similar companies on the main list of the LSE in the UK and on the NASDAQ and the Over-The-Counter-The Bulletin Board (OTCBB) in the US. The paper states that the time intercurring between starting the business and bankruptcy is 60% shorter for AIM companies than for companies in the other markets: in other words, the failure rate of companies listed on AIM appears to be higher than that of comparable companies listed on other markets. Yet, even if AIM firms seem to be more likely to fail, the failure rate can be mitigated by the presence of competent Nomads.

Along with studies on the stock price dynamics or survival profile of second market IPOs, scholars also focus on the corporate performance of IPO firms. In this respect, Khurshed et al. (2003) investigate the post-listing operating performance of UK IPOs. The firms quoted on the Official List appear not to be able to guarantee the same profitability level of the pre-IPO period, hence the deterioration in their post-listing performance is confirmed – in line with the research presented in paragraph 2.1. Whereas, this pattern is not highlighted for the firms quoted on the AIM: while a significant decline, in terms of ROA and ROE, is experienced after the IPO by companies going public on the Official List, a positive increase of these performance measures characterises the AIM. Also, a similar trend emerges from the analysis of the effects of going

[48] Delisting in Continental Europe is more difficult and expensive. Firms listing in Continental Europe are larger and older.

[49] E.g. bankruptcy; failure to comply with the listing requirements.

public on asset turnover. Therefore, a very interesting finding comes to light from this paper: the AIM is the first market recording no evidence of a declining post-listing operating performance.

Moreover, listing on the AIM does not immediately affect the leverage, which instead increases three years after the issue (Khurshed et al., 2003). While on the contrary, listing on the main market results in a permanent drop in leverage, since the IPO brings about a permanent decrease of the debt exposure (i.e. a rebalancing of the capital structure).

However, the view that going public on the AIM is exploited by firms as a launch pad for growth, without having to give up on profitability, is not shared by Doukas and Hoque (2016), who find AIM UK firms to be loss-making. The authors report a poor post-listing operating performance of AIM firms[50] and a positive post-listing operating performance of firms going public on the Official List[51]. Also, the operating performance of AIM firms, both meeting or not meeting the listing requirements of the main market, is characterised by high variability. Hence, AIM IPOs seem to have an inferior operating performance than main market IPOs. In addition, Doukas and Hoque (2016) present a curious finding: the performance of AIM firms would not be better, had they decided to list on the main market instead[52]. No matter where the listing, the performance of AIM firms would still be lower than the performance of companies listed on the main market.

This idea that AIM companies underperform their counterparts on the main market is not infrequent in literature. Gerakos et al. (2013), comparing companies on the AIM UK and on the main markets of the UK and US, reveal not very encouraging results about the economic performance of these companies: in the period 1995-2008, the performance of AIM UK companies is lower than that of companies listed on the other markets. In general, AIM companies perform poorly, underperforming their counterparts on traditional exchanges by about 13% and 30% on the first and second year subsequent to the IPO[53] (Piotroski, 2013). These outcomes are robust to controls for differences in growth, profitability and investment opportunities.

Given such a striking economically substantial underperformance of the companies going public on the AIM, the AIM seems to be a ‘landing pad for struggling firms’ rather than a

[50] AIM firms which do meet the listing requirements of the main market are considered in the analysis.
[51] The authors compute an average three-year post-listing operating performance of -19.9% and +7.33%.
[52] This statement is almost always likely to be true also for the AIM firms meeting the Official List’s more stringent regulatory regime.
[53] In particular, the authors also find out that AIM companies that raise capital during the listing process underperform by a larger magnitude (by between 10 and 17 percentage points) other AIM and main market companies that do not raise capital.

'launching pad for highfliers'. Yet, Gerakos et al. (2013) suggest that the underperformance can partially be attenuated thanks to the effective oversight of high-quality auditors and Nomads. Hence, especially for AIM firms (or in cases of limited regulatory supervision), the adoption of a big-5[54] auditor and of a Nomad characterised by a positive-performance prior experience is of significant relevance.

Furthermore, Piotroski (2013) proposes that such post-listing underperformance can partly be explained by the discretionary accruals of the IPO period. The study documents extremely high pre-listing accruals – to inflate earnings – and post-listing reversals of AIM firms, if compared to the same figures of non-AIM firms. Thus suggesting that, because of the flexible regulatory requirements and limited oversight, AIM firms are more likely to manage discretionary accruals (by increasing them prior to listing, which results into larger reversals after the IPO). Accruals management or lower quality earnings are in this case related to the post-listing underperformance. Additionally, according to Nielsson (2013), underperformance is not due to a lower quality of the listings taking place on the AIM. The author states that AIM firms are of the same quality of firms listed on the leading stock exchanges of Continental Europe or the US: AIM companies are indeed smaller in size, but are comparable in terms of profitability to firms listing on other markets. Then, the paper suggests that differences in the post-listing performance are not to be attributed to differences in the ex-ante quality of the firms listing on AIM, and that more stringent regulatory requirements are not necessary to attract higher quality[55] companies.

Last but not least, Revest and Sapio (2014) address a further dimension of AIM's impact on businesses, that is actual performance. Few empirical studies deal with the impact of AIM on the actual performance of listed companies – where, for actual performance, dimensional and productivity growth are intended.

In the UK, differences between the growth rates of companies listed on the AIM and of similar unlisted firms are found to exist. The presence of intangible assets together with the CEO's level of education and experience positively influence the growth rate of listed companies and are significant determinants of companies' post-listing performance. Also, the reputable Nomads' offering of effective support to firms listed on the AIM results in an increase in the company size. While, on the one hand, an overall positive influence of the AIM on company size is

[54] One of the five largest international auditing firms.

[55] A high quality firm is to be intended as a company characterised by high growth, high market valuation and low leverage.

reported, on the other hand, the productivity growth (e.g. value added per employee) of AIM-listed companies is slower (-20.7%) than that of private companies.
Therefore, a good performance in terms of growth rate is mitigated by an underperformance in terms of productivity: listing on AIM positively affects the growth in size of the company, but an absence of AIM's effects on productivity growth is revealed.

In conclusion, research involving the AIM and the post-listing effects of IPOs made on the AIM does not always provide consistent results. Both positive and negative factors emerge from the analysis made in this paragraph, and while going public on the AIM is a stepping-stone to growth for some scholars, for others going public on the AIM is more than risky. In addition, literature on AIM is not free from questions left unanswered. Today, an open debate concerns the trade-off between the dimensional growth of AIM and the average quality of AIM-listed companies (Revest and Sapio, 2011). In fact, as the AIM's market model spreads, critics fear that the rapid dimensional growth of AIM could be attained at the expense of the quality of the listed firms, putting at risk the market's long-term stability.

2.3 Bridging the Gap

AIM's success is undoubtful. Its attractiveness can be associated to the fact that it enables companies to raise capital at a lower cost. Joining the AIM is not seen as a standard stage in the business life cycle but as an alternative and complementary mode of funding, which does not require being a mature business in order to be granted access to the financial market, vis-à-vis other more costly sources of financing. In the years 1995–2009, second markets have attracted an increasing number of companies: 77.5% of IPOs occurred on the second markets of the four largest European economies. In the same years, market transfers in the London Stock Exchange have been numerous: 282 firms transferred from the Official List of the LSE to AIM UK while only 90 firms moved in the opposite direction (Paleari et al., 2012). Then, the substantial growth in the number of listings on second markets, if compared to main markets, testifies the growing popularity of AIM. Also, the frequent transfers[56] from the LSE's Official List and a net flow of switching firms leaning greatly towards AIM UK, attests the rising success of the AIM.
AIM UK has never stopped growing and developing, thus representing an indisputable proof of resilience. It is one of the most popular second markets in the world and a point of reference

[56] Often cited reasons for transferring towards the AIM are related to the lower costs, higher flexibility and less stringent regulatory requirements associated to this segment. In this respect, the choice of switching market may be driven by changes in the characteristics of the company itself or even by changes in the attributes of the market in question.

for the youngest second markets dedicated to SMEs. In fact, the success gained by AIM UK has made this market a source of inspiration for other stock exchanges that have imitated and replicated the AIM model, creating for instance two 'copies' of AIM (AIM Japan and AIM Italia). Given its rising success, the unique and interesting setting provided by AIM is worthy of study.

The second chapter has focused on analysing the existing literature on IPOs, with a particular insight into the post-listing effects. The evaluation of the corporate performance of IPO firms, which is especially important for shareholders, is found to be a challenging issue. Yet, the relevance of this topic has fostered various studies that evaluate the operating performance of newly listed companies, relying on accounting-based measures and examining the IPO's effects on performance with respect to pre- and post-IPO periods. Such analyses adopt statistical tests or econometric models in order to assess the presence of any variation in the post-listing operating performance. However, the great majority of these studies are conducted on IPOs that involve main markets (view paragraph 2.1) and only a minor part is on IPOs that involve the AIM (view paragraph 2.2).

The reason behind the lack of literature concerning second markets (including AIM) could be linked to the fact that finding data for small companies is generally more problematic. Hence, the smaller size of firms, which quote on second markets or on the AIM, makes analyses more difficult: it is because of this scarce empirical literature that the first part of this chapter has dealt with main markets. In addition, it is worth noting that the research on second markets presented in the second part of this chapter does not consider AIM Italia. The studies mentioned so far only regard AIM UK, the reference point for the foundation of AIM Italia. Then, it must be interesting to observe what happens in the Italian market, since, in this respect, no theoretical clue is present. For this reason, the next pages build on the gap that characterizes the analysis of the effects of AIM Italia on the performance of SMEs, with the aim to assess whether accessing AIM Italia offers benefits to the companies.

Is there a beneficial impact of listing on AIM Italia? What is the post-listing performance of companies newly-listed on AIM Italia? Do AIM-listed firms perform better if compared to their non-listed peers? These are some of the questions addressed – through the analysis of financial statements and, in particular, of data attributable to size, growth, financial structure, profitability – in Chapter 3. Surely, it is not clear what the answers to the above questions will be: it seems difficult to make any expectation[57], since researches on AIM Italia are lacking.

[57] The theory focuses on main markets or, sometimes, on AIM UK. Making inferences for AIM Italia (from such theory) is likely to provide incorrect outcomes. In fact, the unique setting of AIM Italia, the

In conclusion, while Chapter 1 has introduced AIM Italia, Chapter 2 has given an overview of the literature on IPOs trying to provide a theoretical basis for the analysis performed in Chapter 3. To the best of my knowledge, no study focuses on the post-quotation performance of companies listed on AIM Italia; hence, Chapter 3 aims to bridge this gap in literature. Bearing in mind the knowledge gained in the first two chapters, I propose to close this gap by comparing the performance of firms that decided to go public on AIM Italia with that of comparable firms that decided to stay private.

Given the relevance of SMEs in the Italian economy, it is important to close this gap because in this way it is possible to understand whether it is worth for SMEs to list on AIM Italia. In other words, this analysis must be conducted for all those SMEs that are considering going public in Italy, and for those that will consider doing so in the future.

market sentiment and other country-specific features presumably affect companies listing on AIM Italia differently. Therefore, it is reasonable to believe that any theory explored in Chapter 2 cannot be directly applicable to what happens on AIM Italia.

EMPIRICAL ANALYSIS ON THE EFFECTIVENESS OF LISTING ON AIM ITALIA

3.1 Research question: the purpose of the research

What is the post-listing performance of companies newly listed on AIM Italia? Do AIM-listed firms perform better if compared to their non-listed peers? This is the research question I aim to address through the analysis conducted in Chapter 3. In other words, understanding whether listing on AIM offers benefits to companies is the purpose of my dissertation thesis.

Surely, it seems difficult to make any expectation about what the answer to the above question will be, since researches on AIM Italia are lacking.
As mentioned in Chapter 2, theoretical uncertainty generally characterises the analyses of capital markets' effects on corporate performance and the major research effort has been given to main markets. Instead, companies that go public on second markets have received a minor attention from the empirical literature; in fact, papers involving second markets and their impact on corporate performance are less frequent.
Thus, it is not easy to find in literature studies involving the effects of listing on AIM. Actually, to the best of my knowledge, no empirical paper focuses on the post-quotation performance of companies listed on AIM Italia. The reason behind the lack of literature concerning second markets (including AIM) is linked to the fact that finding data for smaller-sized companies is generally more problematic, making analyses more cumbersome. So, through my research I want to bridge this gap in literature.

It is worth to recall that AIM's success is undoubtful: AIM UK is one of the most popular second markets in the world and represents a source of inspiration for the youngest second markets dedicated to SMEs, such as AIM Italia.
Above all, the substantial growth in the number of listings – if compared to main markets – testifies the growing popularity of AIM. Its rising attractiveness can be associated to the market's essence: being an alternative and complementary mode of funding, thus enabling companies to raise capital at a lower cost. Consequently, given its rising success, the unique and interesting setting provided by AIM is worthy of study.

Hence, I am interested in studying the post-listing dynamics of AIM Italia for three main reasons:

1) to the best of my knowledge, no empirical studies focusing on the post-listing performance of companies concentrate exclusively on the AIM Italia;
2) the listing of SMEs on AIM Italia is a relatively recent and growing phenomenon, aiming to enhance SMEs' growth opportunities by providing an alternative source of financing;
3) the relevance of SMEs within the Italian economy.

It is necessary to close the existing gap in literature in order to understand whether it is worth for SMEs to list on AIM Italia. More specifically, it is important to conduct this analysis for all those SMEs that are considering going public, and for those that will consider doing so in the future.

The next pages illustrate the gap that characterises the analysis of the effects of AIM Italia on the performance of SMEs, with the aim to assess whether accessing AIM Italia offers benefits to the companies.

3.2 The method: data, sample, variables

Bearing in mind the knowledge gained in the first two chapters, I suggest bridging the above-mentioned gap in literature by comparing the performance of firms that decided to go public on AIM Italia with that of comparable firms that continued to stay private. More specifically, to understand whether listing on AIM offers benefits to companies, I have selected a sample of AIM-listed companies and have identified a number of non-listed firms that were comparable pre-quotation. Afterwards, I have detected if, in the post-listing period, significant differences in corporate performance exist between the AIM-listed firms and their respective peers.

The solution I propose to close the gap is not completely innovative because some pieces of research, like Belcredi and Gualtieri (1995) or Aiello and Silipo (1997), have already focused their attention on the comparison between listed and non-public companies. However, although an approach similar to mine has been adopted in literature, I have still been implementing something new because this technique has never been used before for AIM Italia.

Yet, it is worth to note the main issue related to answering my research question: since information disclosure for SMEs is limited, the problem of missing data is likely to emerge. The risk of having to deal with the problem of missing data represents the reason why empirical studies in literature tend to focus on listed larger-sized firms rather than on SMEs. In fact, finding data for smaller-sized companies is generally more problematic and adds a degree of complexity to the analysis; consequently, a series of assumptions – listed in the following pages – have necessarily been made.

Before presenting the findings of my research in the next paragraphs, I provide below the details concerning the 'preparation phase' of the analysis:

- Data source & data elaboration;
- Sample definition;
- Selected variables.

3.2.1 Data source & data elaboration

Data has been collected on the AIDA[58] platform, which is a database containing economic-financial, personal and commercial information of all joint-stock companies operating in Italy. For the analysis[59] of the dataset, of the single variables and of the relation between variables, the R software (a software for statistical computing and graphics), together with Excel, have been used.

3.2.2 Sample definition

During the sample definition process a series of assumptions have been made; such assumptions have been necessary to deal with information gaps. In fact, not surprisingly, the above-mentioned problem has emerged: the consideration of non-listed SMEs implies limited information availability.
Before looking for non-listed peer companies, I have identified the optimal way to make the comparison between AIM-listed firms and their peers. In this respect, the use of statutory financial statements has been made fundamental.

Why are statutory financial statements the optimal choice?
I have tried to consider consolidated financial statements before resorting to the use of statutory financial statements. However, while all AIM-listed firms (including subholdings) that are part of a group release consolidated financial data, the same is generally not true for their non-listed counterparts. Consequently, since non-listed ultimate owners and controlled subsidiaries lack consolidated financial data, it is not possible to make the comparison between listed and non-listed firms based on consolidated financial statements.
I have then examined the option of making a comparison between the consolidated data (of AIM-listed firms) and the statutory data (for non-listed SMEs). Such possibility would have

[58] Data source: AIDA (Analisi Informatizzata delle Aziende Italiane) – Bureau van Dijk.
[59] Data elaboration: R and Microsoft Excel.

contemplated the selection of only 'single' companies (not part of a group or without majority shareholdings) as comparables, in order to use truthful statutory data and avoid distortions. Yet, intuitively, an AIM-listed company belonging to a group is in no way comparable to a SME not belonging to a group. Therefore, also the consolidated-statutory comparison has been excluded. Finally, a third alternative regards the utilisation of just statutory financial statements, for both public and private companies. This third option has been deemed the optimal one since it overcomes any distortion deriving from the consolidated-statutory comparison. Moreover, the use of statutory financial statements is nothing new: in literature, Belcredi and Gualtieri (1995), Pagano et al. (1996) and Bonaccorsi di Patti (1999) have all conducted empirical analyses by relying on statutory data.

Furthermore, the use of statutory financial statements must be accompanied by an 'evaluation of relevance'. In other words, it is necessary to construct a sample made up of companies whose statutory financial statements are meaningful; for such companies, statutory data are significant if compared to consolidated data – the weight of the statutory statements on the consolidated ones is high – so that the use of consolidated financial statements is not required. This assumption is explained in more detail below.

To begin with, the composition of the sample can be summarised under three categories:

- CASE 1: single/independent firm;
- CASE 2: global ultimate owner of the corporate group;
- CASE 3: controlled subsidiary.

CASE 1 represents the simplest firm-typology. In fact, the statutory financial statement is fully informative for companies that are single/independent, thus not belonging to a corporate group. Under this particular circumstance, no issue emerges and no 'evaluation of relevance' is required.

Instead, an 'evaluation of relevance' is necessary when dealing with *CASE 2* and *CASE 3*. Global ultimate owners and controlled subsidiaries are part of a corporate group, hence, in theory, consolidated financial statements should be examined when considering this kind of firms. However, as already stated, the use of consolidated data is not feasible. Consequently, to correctly use statutory data, I have resorted to an assumption: the 'evaluation of relevance'.

How does the 'evaluation of relevance' assumption work?

To understand whether a company belonging to a group is operating, I have computed the relevance of the company's statutory financial statement with respect to the economic-financial position of the group. Once a relevance threshold is surpassed, using the statutory financial

statement is conceptually right even if the company in question is part of a group; conversely, once a relevance threshold is not surpassed, using the statutory financial statement is not conceptually right and it is better to exclude the company in question because not operating.

I have set the relevance threshold equal to 70%, and exceptions to meeting such level of relevance have been examined one by one. For instance, in a couple of cases, for companies belonging to a numerous corporate group (i.e. more than 15 companies in the group), I have decided to lower the threshold to 60%. In this way, I have included within the sample firms that would have otherwise been excluded, but that, in my opinion, are visibly operating and play a relevant position within their group.

To better understand the reasoning behind the 'evaluation of relevance' assumption, Table 3.1 reports an example.

Table 3.1: Evaluation of relevance – an example

NAME	TYPE FS	SALES					
		T-2	T-1	T	T+1	T+2	T+3
GIORGIO FEDON & FIGLI S.P.A. 2014	***Statutory***	47,910,000	51,037,000	53,493,000	59,692,000	60,699,000	60,544,000
	Consolidated	60,528,000	60,433,000	62,621,000	71,378,000	71,617,000	67,405,000
	% ON GROUP	**79.15%**	**84.45%**	**85.42%**	**83.63%**	**84.76%**	**89.82%**

NAME	TYPE FS	ASSETS					
		T-2	T-1	T	T+1	T+2	T+3
GIORGIO FEDON & FIGLI S.P.A. 2014	***Statutory***	41,603,000	40,844,000	48,796,000	47,677,000	51,123,000	52,518,000
	Consolidated	45,178,000	45,250,000	55,622,000	55,753,000	58,565,000	56,782,000
	% ON GROUP	**92.09%**	**90.26%**	**87.73%**	**85.51%**	**87.29%**	**92.49%**

NAME	TYPE FS	EQUITY					
		T-2	T-1	T	T+1	T+2	T+3
GIORGIO FEDON & FIGLI S.P.A. 2014	***Statutory***	13,045,000	13,872,000	12,587,000	13,464,000	13,146,000	10,702,000
	Consolidated	15,691,000	16,780,000	17,416,000	18,857,000	19,571,000	14,659,000
	% ON GROUP	**83.14%**	**82.67%**	**72.27%**	**71.40%**	**67.17%**	**73.01%**

Source: Personal elaboration

Three dimensions have been considered for the 'evaluation of relevance': revenues, total assets and shareholders' equity. I have calculated the share of the company's revenues on the group's revenues, the share of the company's assets on the group's assets and the share of the company's equity on the group's equity. Such computation has been conducted before including the firms in the sample, to get an indication on the reliability of their statutory financial statements.

Thus, the aim of 'evaluation of relevance' assumption is to verify how much the company weighs within the group. If it weighs very little, studying its statutory data makes no sense because the statutory financial statement is not representative of the business in question. Otherwise, I can work with the company's statutory financial statements because they are informative and significant.

Now that the main underlying assumption is clear, here are further details that have led to the sample definition.

In particular, the final sample has been identified by following two steps:

- STEP 1: selection of AIM-listed companies;
- STEP 2: identification of non-listed peer companies.

STEP 1: identification of AIM-listed companies

A list of the assumptions that I have formulated to select the listed subsample follows.

-AIM-listed firms that went public in the years 2010-2016 have been considered. This particular time frame of IPOs has been chosen in order to observe financial results for at least 2 years post-quotation. In fact, the empirical analysis refers to data for the quotation year (t) and for the three post-listing years (t+1, t+2, t+3), but for AIM-listed companies that went public in 2016, financial data has been retrieved only[60] for 2016, 2017, 2018 (t, t+1, t+2).

-Only Italian companies have been considered. Foreign companies have been excluded from the sample.

-By conducting the 'evaluation of relevance', only operating companies have been included (any non-operating ultimate owner/controlled subsidiary has not been taken in account).

-AIM-listed subsidiaries controlled by listed companies have been excluded from the sample because being controlled by a listed company, for the sake of the analysis, could represent a distortion.

-The effect of delistings has not been taken in consideration: all the firms inspected were listed on AIM on the 31/12/2019.

-Any firm whose IPO was characterised by the intervention of a SPAC (Special Purpose Acquisition Company) has been excluded from the sample.

As a result, the final listed subsample consists of 33 companies.

STEP 2: identification of non-listed peer companies

The identification of peers for the 33 AIM-listed companies has been conducted by using AIDA.

I have initially considered the possibility of adopting the propensity score matching method to statistically match each AIM-listed company with a group of comparable companies. However, because of the lack of consolidated financial data and, therefore, the need of assessing the

[60] Financial statements for the year 2019 were not available when data has been collected (15/05/2020).

relevance of each statutory financial statement (to make the statutory-statutory comparison), the use of propensity score matching has not been possible.

Hence, I have manually identified firms that were similar – in the pre-quotation period – to the 33 AIM-listed companies. The comparability has been evaluated on the base of industry, size, profitability and governance structure.

First of all, AIDA has facilitated the selection of comparables thanks to data filtering. As shown in the example in Figure 3.1, the following filters have been set:

-the peer company must be non-listed;

-the peer's Ateco 2007 industry code must coincide with that of the respective AIM-listed company;

-the peer's size, in terms of revenues and assets, must coincide with that of the respective AIM-listed company;

-the profitability condition of the peer must be comparable to that of the respective AIM-listed company (i.e. profit-making or loss-making).

Figure 3.1: Peer identification – an example

1. Società non quotate	2.042.999	2.042.999
2. ATECO: 620100 - Produzione di software non connesso all'edizione	22.944	22.926
3. Ricavi delle vendite (migl EUR): 2015, 2014, 2013, per almeno uno degli anni selezionati, min=10.000, max=50.000	27.419	233
4. Totale Attività (migl EUR): 2015, 2014, 2013, per almeno uno degli anni selezionati, min=10.000, max=43.000	38.812	165
5. Utile Netto (migl EUR): 2015, 2014, 2013, per almeno uno degli anni selezionati, min=0	811.286	154

Source: AIDA – Bureau van Dijk

Afterwards, the results of the data filtering process have been analysed one by one and I have chosen the comparable items by looking at their governance structure and by evaluating the relevance of their statutory data.

Additional details and exceptions are described below. In fact, it is worth noting that:

-All of the above selection criteria have been verified in the years pre-quotation (t-3, t-2, t-1). In particular, where possible[61], priority has been given to comparability of year t-2, since economic-financial data in year t-1 tends to be distorted: not by chance, Jain and Kini (1994) and Mikkelson et al. (1997) point out that a higher performance can often be observed in year t-1. In addition, considering year t-2 is better also because it allows to contemplate the cases of companies listing in the first months of the year: for these companies, year t-1 represents just 'a couple of months before' the quotation date.

[61] Exceptions refer to cases in which year t-2 is missing because – at the time – the company did not still exist.

-Whenever the Ateco 2007 industry code has led to the selection of a limited number of comparable companies, I have also included in the data filtering process AIDA's so-called 'Gruppo dei Pari' (translated: group of peers). In fact, AIDA classifies each firm according to the Ateco 2007 industry code and to the 'Gruppo dei Pari'. The former is a stricter categorisation based on the six units of the Ateco code, the latter is a less stringent categorisation that relies on only the first three units of the Ateco code. In this way, I have been able to construct a more representative sample, extending the peers' identification among firms sharing the same activity code.

-As for size filtering, I have relied on the definition of SME. As mentioned in Chapter 1, SMEs consist of micro, small and medium enterprises, where each size is determined by a range of values for revenues and assets. Hence, I have set my size-filters accordingly. For instance, if the AIM-listed company pre-quotation was micro, I have looked for non-listed peers with less than €2 million of revenues and assets in the pre-listing period. In the same way, if the AIM-listed company was small (medium), I have looked for peers with revenues and assets ranging between €2 and €10 million (with revenues ranging between €10 and €50 million and assets ranging between €10 and €43 million).

-Generally, I have matched AIM-listed profit-making firms with profit-making comparables, and vice versa. This has been possible by extracting firms with the minimum/maximum value of the profit/loss measure equal to zero. On top of this, whenever the results of the data filtering process have been extremely numerous, I have screened the results by ROA and ROI measures and I have then manually selected the companies with the most similar profitability condition.

-A last clarification regards the assessment of the governance structure. After filtering data in AIDA, a final step of the peers' identification has consisted in examining the status of each potential peer. In fact, AIDA provides information about the status, telling whether a firm is single, ultimate owner or controlled subsidiary; however, the indicated status is as of today. Consequently, I have verified that the current status coincides with that of the pre-quotation period: I have checked the M&A information (retrieved in AIDA) to investigate if, in the years concerned, there has been any relevant event[62] that could question the veracity of the current state of companies. I have performed such verification in order to match AIM-listed companies with peers characterised by a similar governance structure[63]. In other words, I have matched

[62] Has there been any relevant change in the governance structure? Has the company in question been the target of an acquisition? Has the company in question gone public during the reference years?

[63] Whenever such verification has not been possible, a strong assumption has been made: the status today coincides with the status in the pre-listing period. This assumption concerns the peer companies for which AIDA does not provide exhaustive information.

AIM-listed single companies with single-peers, AIM-listed ultimate owners with ultimate owner-peers and AIM-listed controlled subsidiaries with controlled subsidiary-peers. Finally yet importantly, I have also checked that the selected peers are not controlled by listed companies.

The sample definition process, described in detail in the previous pages, has led to a final sample made up of 33 listed companies and 484 comparable firms. The former are present in Table 3.2 below, while for the list of the entire final sample view Table 3.3 in the Appendix.

Table 3.2: Final listed subsample

AIM company	Quotation year	Number of comparables
FINTEL ENERGIA GROUP S.P.A.	2010	3
VISIBILIA EDITORE S.P.A.	2010	13
ROSETTI MARINO S.P.A.	2010	4
IMVEST S.P.A.	2011	20
AMBROMOBILIARE S.P.A.	2011	20
PRISMI S.P.A.	2012	15
SOFTEC S.P.A.	2012	10
CDR ADVANCE CAPITAL S.P.A.	2012	20
ENERTRONICA SANTERNO S.P.A.	2013	16
LEONE FILM GROUP S.P.A.	2013	14
DIGITAL MAGICS S.P.A.	2013	14
WM CAPITAL S.P.A.	2013	20
COSTAMP GROUP S.P.A.	2014	19
GIORGIO FEDON & FIGLI SPA	2014	11
ECOSUNTEK S.P.A.	2014	14
GRUPPO GREEN POWER S.P.A.	2014	20
NOTORIOUS PICTURES S.P.A.	2014	20
GO INTERNET S.P.A	2014	12
EXPERT SYSTEM S.P.A.	2014	17
MAILUP S.P.A.	2014	20
INIZIATIVE BRESCIANE – INBRE – S.P.A.	2014	8
MASI AGRICOLA S.P.A.	2015	11
COVER 50 S.P.A.	2015	16
CLABO SOCIETA' PER AZIONI	2015	18
BLUE FINANCIAL COMMUNICATION S.P.A.	2015	17
H-FARM S.P.A.	2015	15
ASSITECA S.P.A.	2015	3
DIGITOUCH S.P.A.	2015	17
CALEIDO GROUP S.P.A.	2015	18
SITI – B&T GROUP S.P.A.	2016	16
ENERGICA MOTOR COMPANY S.P.A.	2016	8
FOPE S.P.A.	2016	15
VETRYA S.P.A	2016	20

Source: Personal elaboration

3.2.3 Selected variables

Of course, it is possible to retrieve from AIDA information on hundreds of economic-financial variables. Yet, the decision on the variables' selection has been made by using as reference point the empirical literature on IPOs.

For the sake of my dissertation, I have selected a limited number of variables, which are listed in Table 3.4; these represent, in my opinion, the most relevant data to be studied. Also, as already mentioned, all the economic-financial variables enumerated below are available for the entire time frame of analysis (t, t+1, t+2, t+3).

Table 3.4: Selected variables

General characteristics	Size & Growth	Efficiency & Profitability	Financial structure & Liquidity
Ateco 2007	Revenues	Operating expenses	Equity
Region	Sales growth	Capital intensity	Net financial position (NFP)
Year of constitution	Assets	Asset turnover	Debt/Equity (D/E)
Number of companies in corporate group	Assets growth	Profit or loss	Debt/Ebitda
Artisan	Current assets/Assets	Ebitda/Sales	NFP/Ebitda
International	Property Plant Equipment (PPE)/Assets	Return on assets (ROA)	Interest coverage ratio
Innovative Start-up	Intangibles	Return on equity (ROE)	Short-term liabilities/Liabilities
Innovative SME		Return on investment (ROI)	Net working capital (NWC)
			Current ratio

Source: Personal elaboration

3.3 Descriptive statistics[64]

This paragraph provides a descriptive summary of the sample. For a more detailed analysis and discussion of the results please refer to Chapter 4.

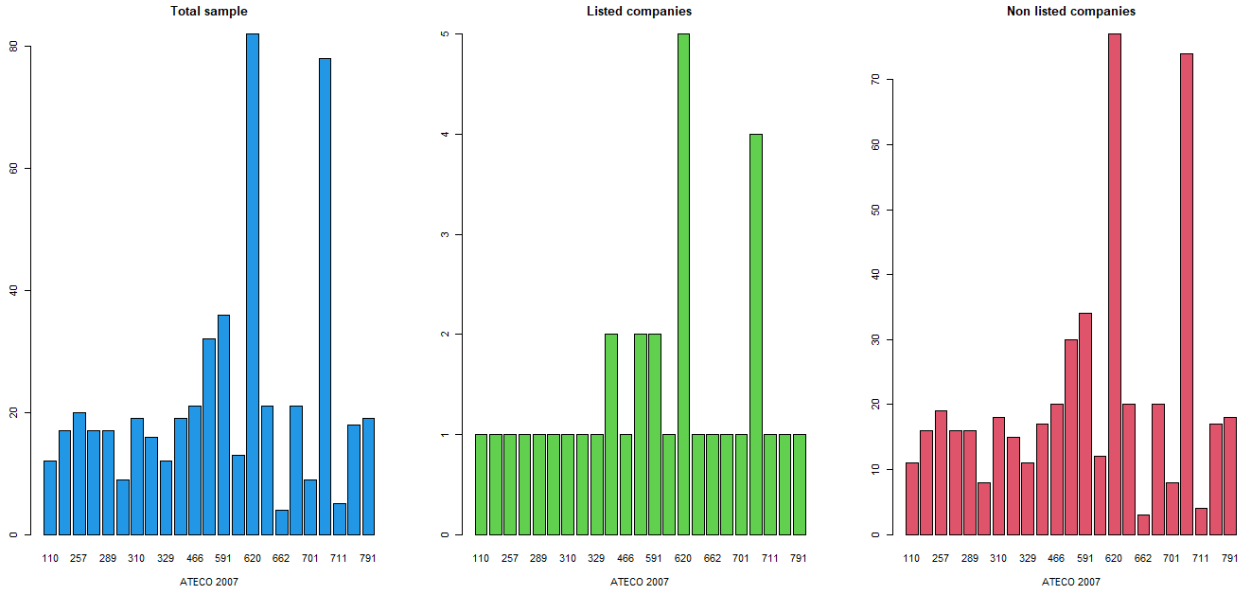
As previously mentioned, the total sample consists of 517 observations, where 33 are AIM-listed companies and the remaining 484 are their respective selected peers. In addition, it is worth noting that, for almost half of the sample, year t corresponds to year 2014-2015; in fact, almost half of the AIM-listed companies went public during 2014 and 2015 (view Table 3.2).

3.3.1 Pre-listing snapshot

Before focusing on the descriptive analysis of the post-listing period, here is a brief look at the pre-listing years.
By definition, during these years the AIM-listed companies and their peers were comparable. Yet, as a double check, it is interesting to illustrate the starting condition of the sample (in the years t-3, t-2, t-1). Hence, the comparison between the listed and non-listed subsample is briefly presented, just for the variables determining comparability (sector, revenues, assets, profit/loss).
To begin with, Figure 3.2 displays the bar plots for the Ateco 2007 industry code, considering the first three units of the code for simplicity of representation. The slight difference between the listed and non-listed subsample is driven by the non-constant number of peers identified for each listed company. Table 3.5 in the Appendix provides the legend for each industry code, clarifying which type of activity is being conducted by each AIM-listed company.

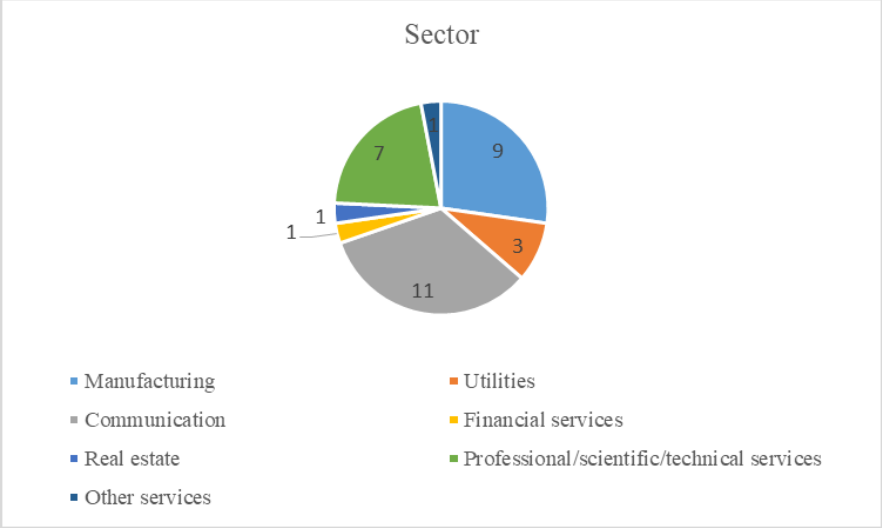
[64] All the figures of paragraph 3.3 are *Personal elaborations*.

Figure 3.2: ATECO 2007 industry code



The 64% of the listed subsample belongs to the tertiary sector of the economy, while the remaining 36% to the secondary sector. In particular, as shown in Figure 3.3, communication and manufacturing activities dominate the sample, even if professional/scientific/technical services play a relevant role too.

Figure 3.3: Listed companies by sector



As for size, revenues and assets are to be mentioned.

Revenues and assets for both listed and non-listed companies are on average slightly lower than €20 million in the pre-listing period. Instead, the median value of revenues and assets is around €10 million.

The (log) distribution of revenues and assets is depicted in Figure 3.4b and Figure 3.5b. In this respect, I have preferred to apply the logarithmic transformation to reduce the strongly positive

asymmetric trend of the distributions (view the distribution of revenues and assets – without log – in Figure 3.4a and Figure 3.5a, Appendix).

Figure 3.4b: Revenues (pre)

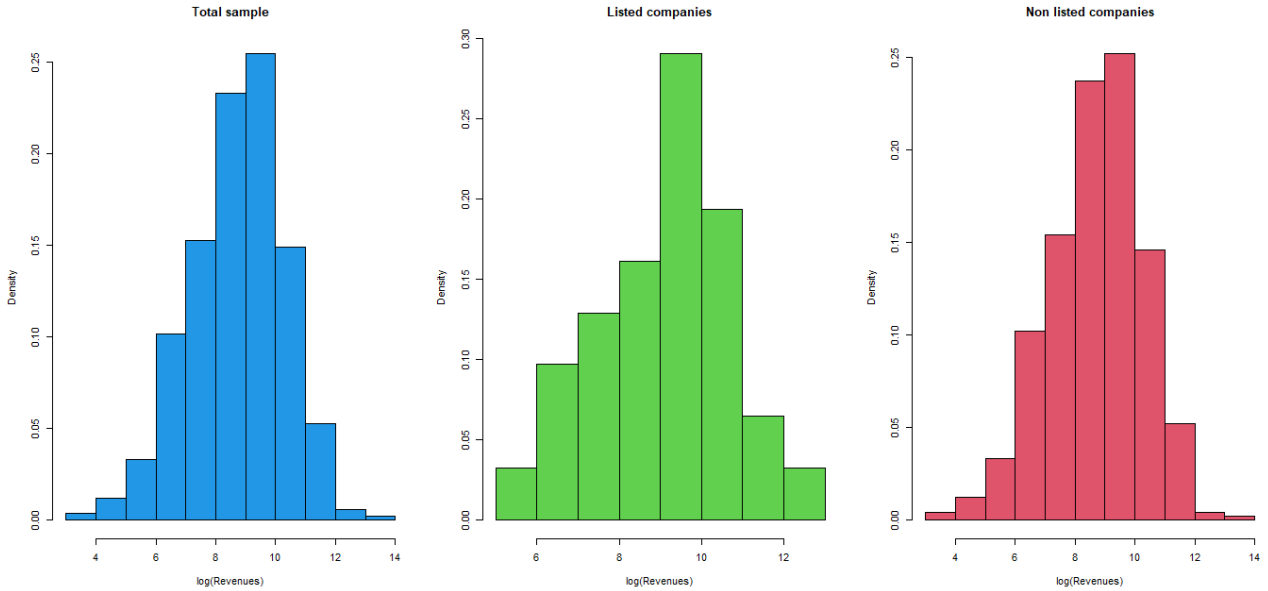
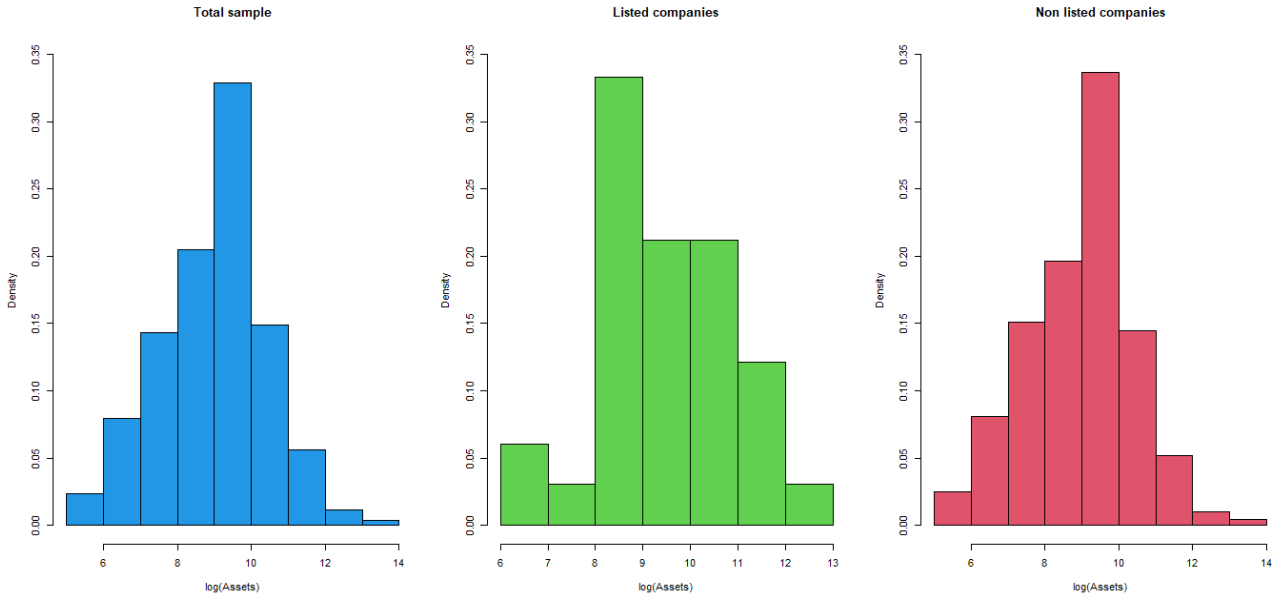


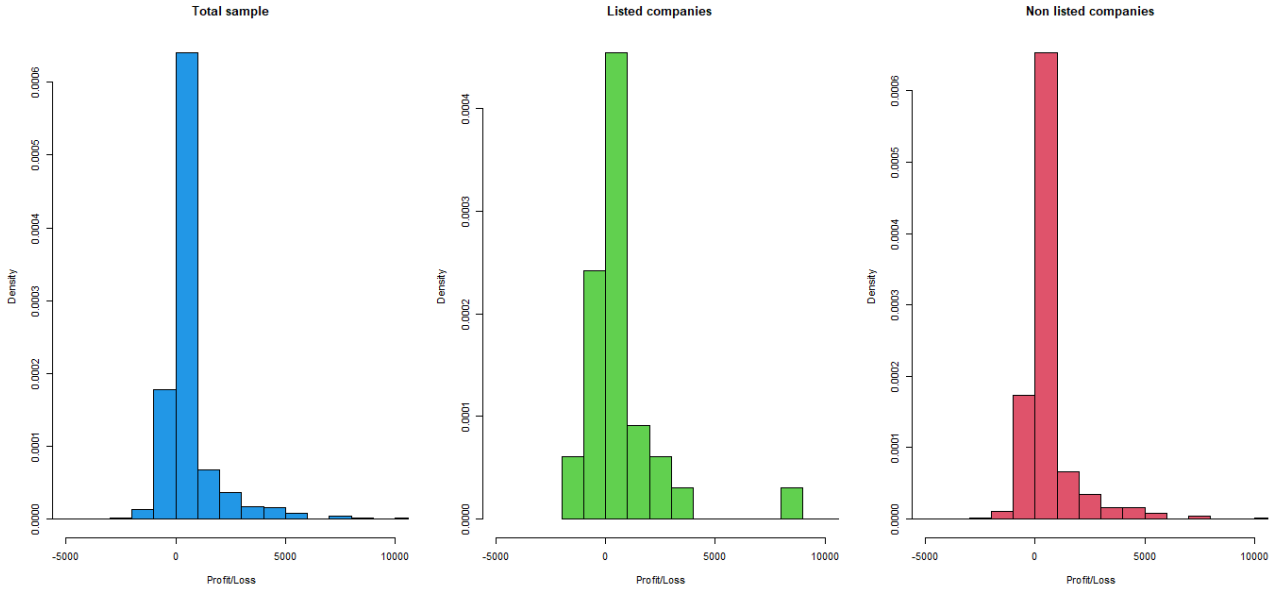
Figure 3.5b: Assets (pre)



Moreover, I have performed the t-test on the size measures to check whether there is a significant difference, in revenues and assets, between the AIM-listed companies and their non-listed counterparts. In both cases, given an error equal to 5%, the P-values indicate that no differences in revenues or assets exist between listed and non-listed companies. In fact, as shown by Table 3.5, the P-values are equal to 0.1149 and 0.1752, respectively.

Finally, Figure 3.6 compares the profitability histograms of listed and non-listed firms. In this case, it has not been possible to apply the logarithmic transformation to the profit/loss distribution because the profitability measure can take negative values, making the use of logarithm not valid.

Figure 3.6: Profit/Loss (pre)



On average, in the pre-listing period, profits for both listed and non-listed companies are around €800 thousands. Instead, the median value of profits is way lower, less than €150 thousands. In addition, according to the t-test reported in Table 3.5, the P-value signals no differences in terms of profitability between the AIM-listed companies and their peers, given an error equal to 5%. The latter represents a borderline case but, still, the P-value is greater than 0.05, so I can claim that no significant difference exists.

Table 3.5: T-test of revenues, assets and profit/loss (pre)

	Group		Two Sample t-test 95% confidence interval			
Variable	Ipo Yes	Ipo No	Upper	Lower	t	p-value
Revenues						
df	515	515	2799.873	-25743.302	-1.5792	0.1149
Mean	29045.74	17574.03				
Assets						
df	515	515	5116.658	-28004.928	-1.3576	0.1752
Mean	31762.10	20317.96				
Profit/loss						
df	515	515	8.281519	-1925.952271	-1.9478	0.05199
Mean	1614.2272	655.3918				

3.3.2 Post-listing effects

The above figures testify that the AIM-listed firms and their comparables were similar in the pre-listing years: the expectation of not observing relevant differences between the two subsamples has been verified and has proven to be true. Hence, this means that I have successfully selected the group of peer companies.

Starting from the assumption that firms were comparable pre-quotation, it just comes natural to ask ourselves: what are the effects of listing on AIM Italia? To answer our research question, it is necessary to shift the attention to the descriptive analysis of the post-listing period. For the sake of the dissertation, examining how the listed and non-listed subsamples differ in the years t, t+1, t+2, t+3 is of particular interest.

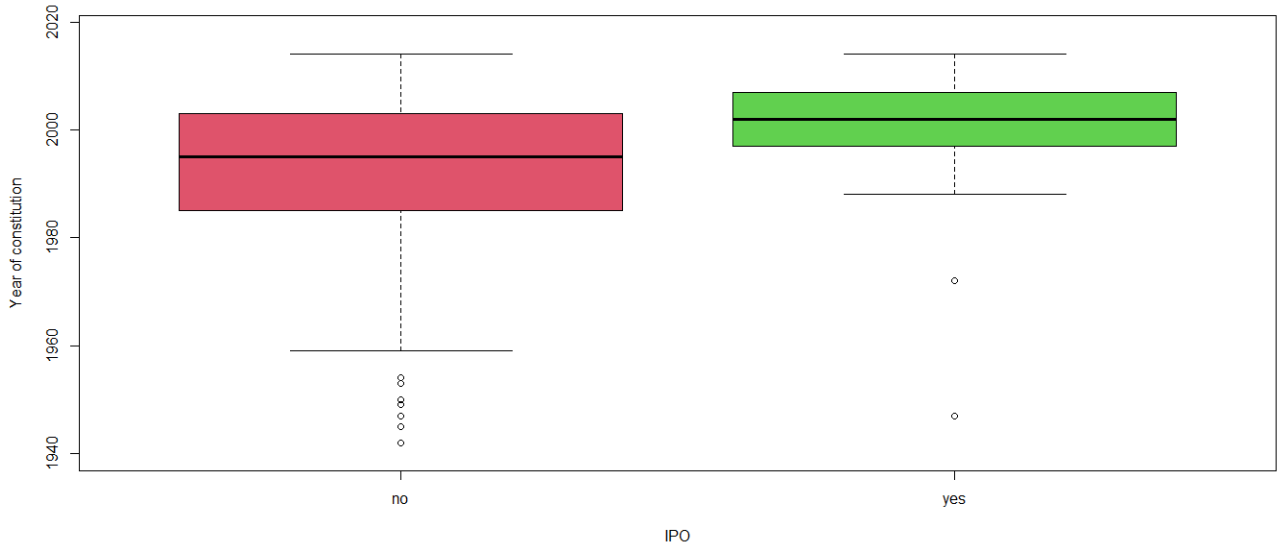
In the following pages, the descriptive statistics of the post-quotation years have been arranged into four macro-categories:

1) General characteristics;
2) Size & growth;
3) Efficiency & profitability;
4) Financial structure & liquidity.

General characteristics

On average, AIM-listed companies are six years younger than their respective peers. In fact, the year of constitution of the former is 1998, while that of the latter is 1992. In this respect, Figure 3.7 visually shows the distribution of the year of constitution, for both the listed and non-listed subsample.

Figure 3.7: Year of constitution per subsample

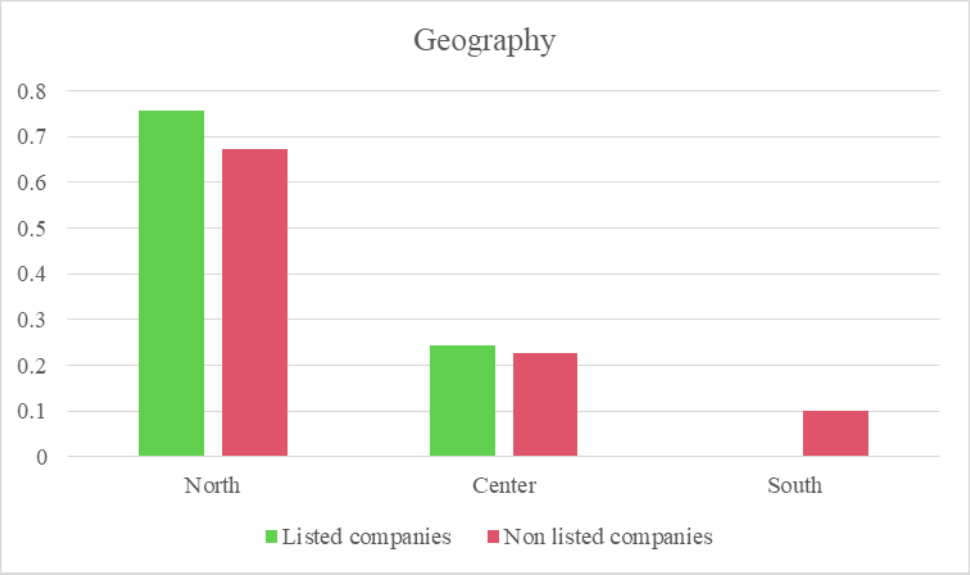


The 76% of the AIM-listed firms is located in Northern Italy (in absolute terms: 25 out of 33), while the remainder is located in Central Italy.

Figure 3.8 points out the major geographical divergence between the listed and non-listed subsample: no AIM-listed firm is located in the South, versus 10% of comparables that is based in the South.

Anyway, the location of the selected peers is quite in line with the geographical distribution of the listed subsample, and more than two-thirds of the overall sample is based in the North.

Figure 3.8: Geographical region per subsample



On average, the listed firms belong to corporate groups made up of 11 companies. Their non-listed counterparts, instead, tend to belong to slightly smaller groups, with around 8 companies in the corporate group.

Surprisingly, very few companies operate internationally as exporters (1 listed company and 25 peers).

Among the 517 firms of the sample, none is an innovative startup and nearly none (just 10 peers) is focused on artisan craftsmanship.

Innovative SMEs represent a minor portion of the sample, but are visibly more numerous among the listed firms. Nearly one third (27%) of the AIM-listed firms are innovative SMEs, compared to just the 2% of the non-listed subsample.

The next part of the exploratory analysis follows a standard scheme.
I have reported below the economic-financial data, considering median values in order to avoid data distortions driven by outliers. Yet, the complete set of statistics – minimum, 1st quartile, median, mean, 3rd quartile, maximum – is outlined in Figure 3.9 of the Appendix.
Also, each quantitative variable has been analysed in the same descriptive way:
-I have drawn and overlapped the distributions of the quantitative variable in question, for the listed and non-listed subsample, in year t, t+1, t+2, t+3.
-To verify if a significant difference in the quantitative variable exists, between the listed and non-listed subsample, I have conducted the t-test[65] (in year t, t+1, t+2, t+3).
In the following pages, only the significantly different distributions are graphically represented; while all the other graphs, where statistical differences are not present, are placed in the Appendix.

Size & growth
The variables taken in consideration to analyse size and growth are the following:

- Revenues & sales growth
- Assets & assets growth
- Current assets/Assets & PPE/Assets
- Intangibles

In the post-listing period, the revenues of listed firms range from €10 million to €15 million. A particularly high growth rate characterises the revenues of listed firms in the first two years (6% and 9%, respectively). The revenues of the non-listed subsample, instead, stay below €10 million for the entire analysed time frame, with stable growth rates (of about 4%) in all years.
Hence, AIM-listed firms tend to have non-significantly higher revenues but significantly higher sales growth rates, if compared to their non-listed counterparts.

The listed firms' assets are above €20 million in the post-listing period, and grow to €30 million. Similarly to revenues, the growth rate of assets is highest in the first two years post-quotation (6% and 10%, respectively) and decreases in the third year. On the other hand, the assets of non-listed companies are stable at €10 million and are characterised by a lower and more stable growth rate (less than 4%).

[65] The result of the test is detailed beneath the headline of each histogram. A p-value smaller than 0.05 means that I reject the null hypothesis (H_0: no significant difference between the two variables) and, therefore, I conclude that a significant difference exists.

In general, both assets and assets growth are higher for the listed subsample, but not significantly.

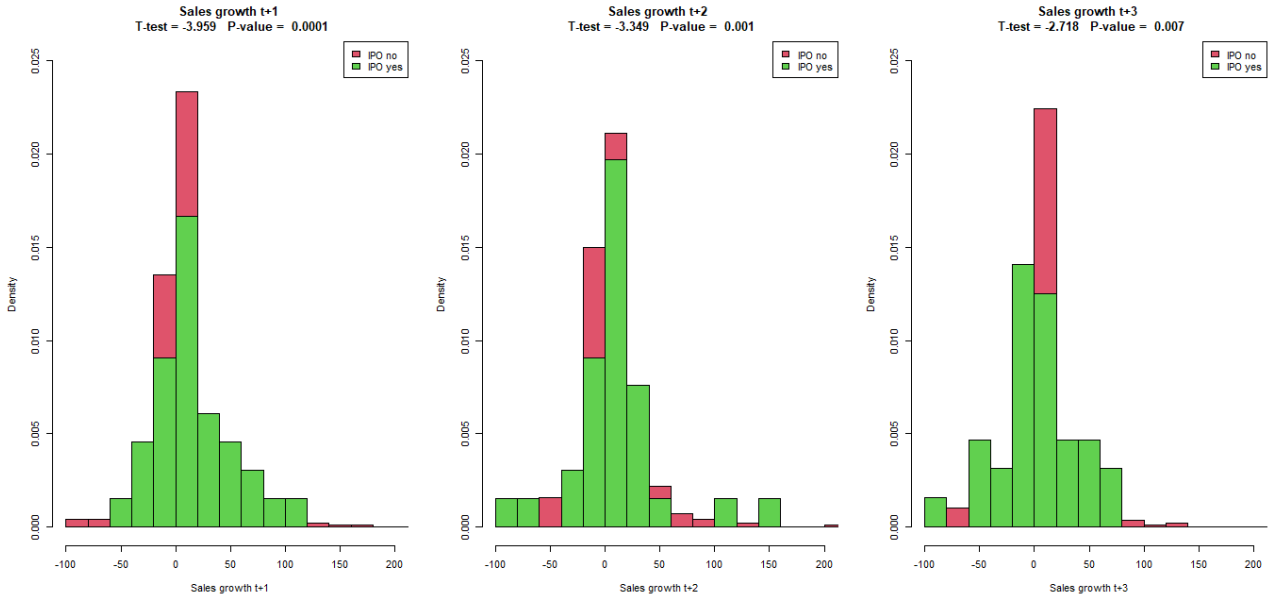
Also the structure of total assets is worth of mention. In particular, current assets versus PPE are analysed below.

The share of current assets on total assets is slightly more than 50% for the listed subsample and around 70% for the non-listed subsample. Whereas, PPE represent less than 1% and around 7% of total assets, for listed and non-listed firms, respectively[66].

These shares are constant in the analysed period and signal a significant difference in the composition of assets between the two subsamples.

Finally, it is interesting to note that intangibles are significantly higher for the AIM-listed firms. More specifically, these are around €2 million for the listed subsample (more than 5 times higher than the intangibles of the non-listed subsample). Such high difference in intangibles cannot be attributed to the absolute value of assets, because it persists even if intangibles are compared to total assets.

Figure 3.11a: Distribution of sales growth



[66] These very low values are probably due to the dominance, in the sample, of tertiary sector activities.

Figure 3.11b: Distribution of sales growth

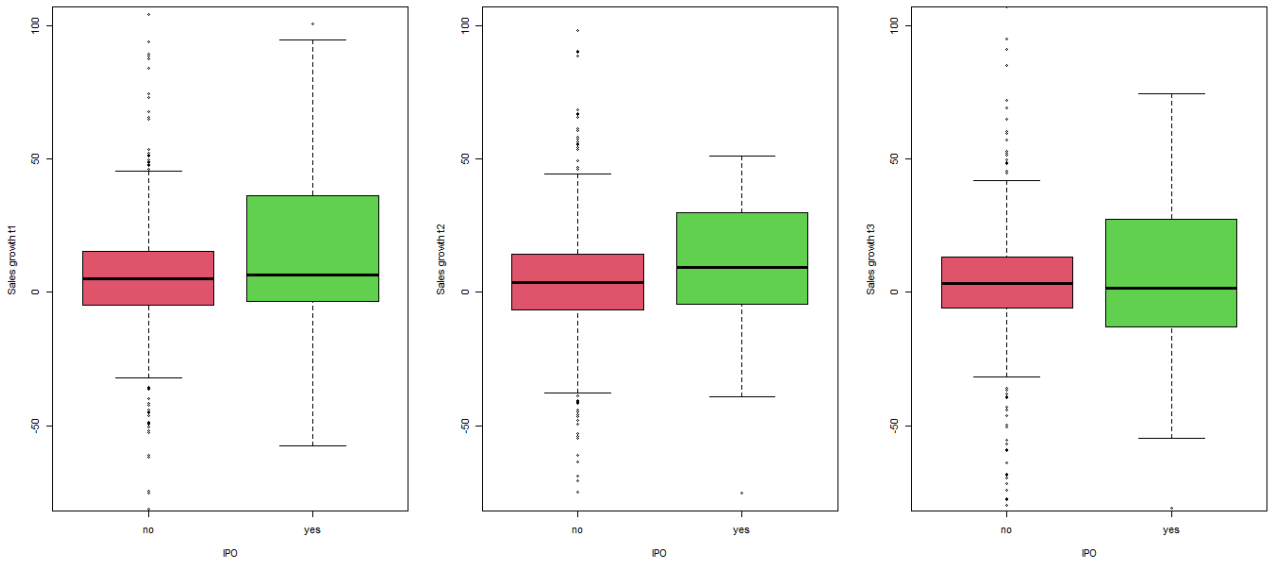


Figure 3.14a: Distribution of Current assets/Assets

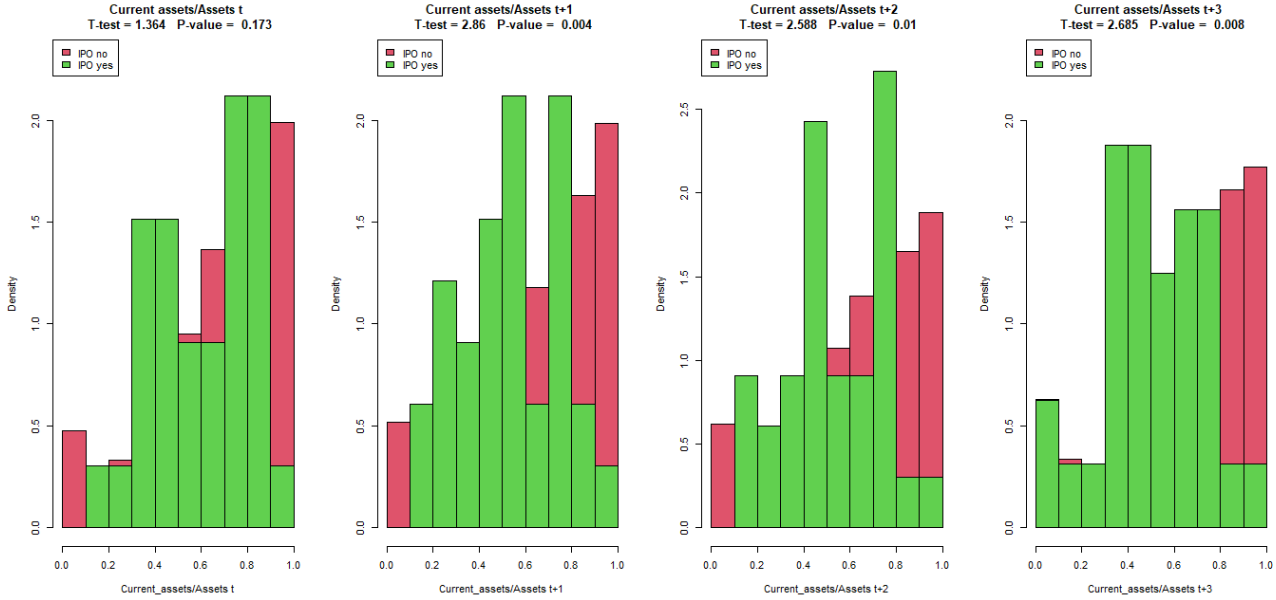


Figure 3.14b: Distribution of Current assets/Assets

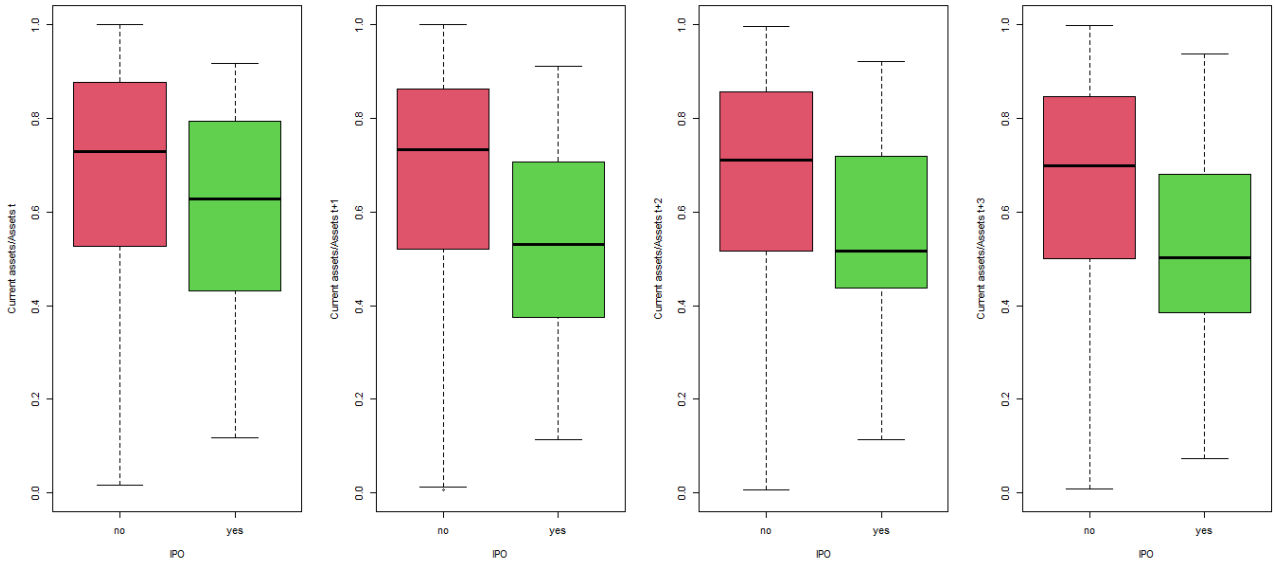


Figure 3.15a: Distribution of PPE/Assets

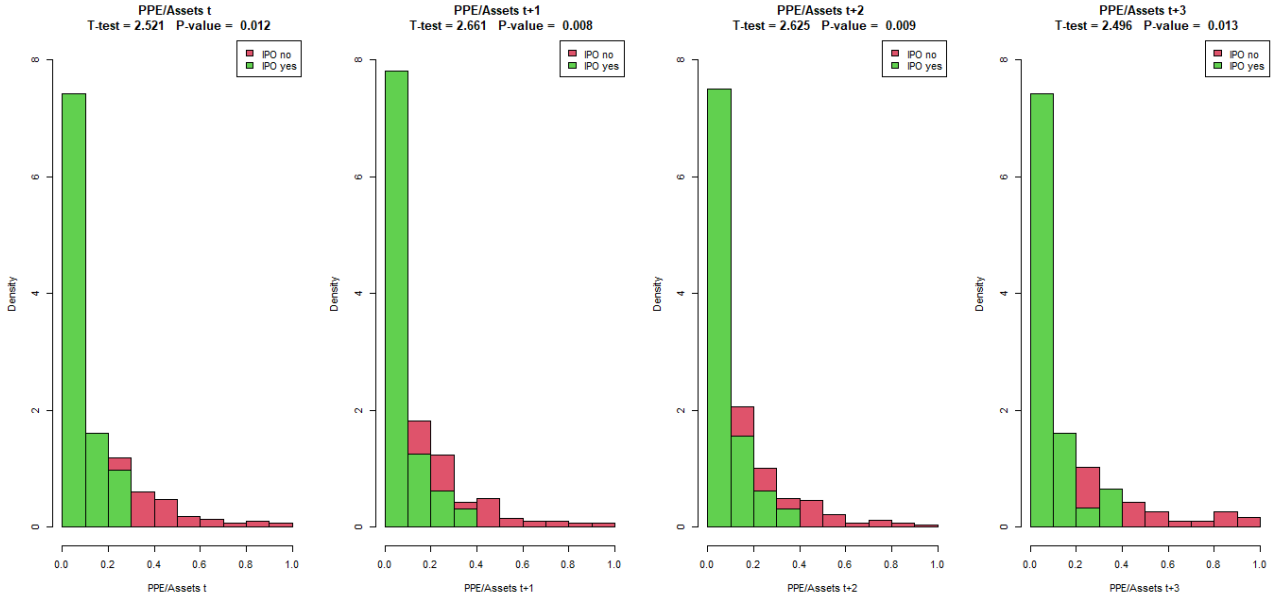


Figure 3.15b: Distribution of PPE/Assets

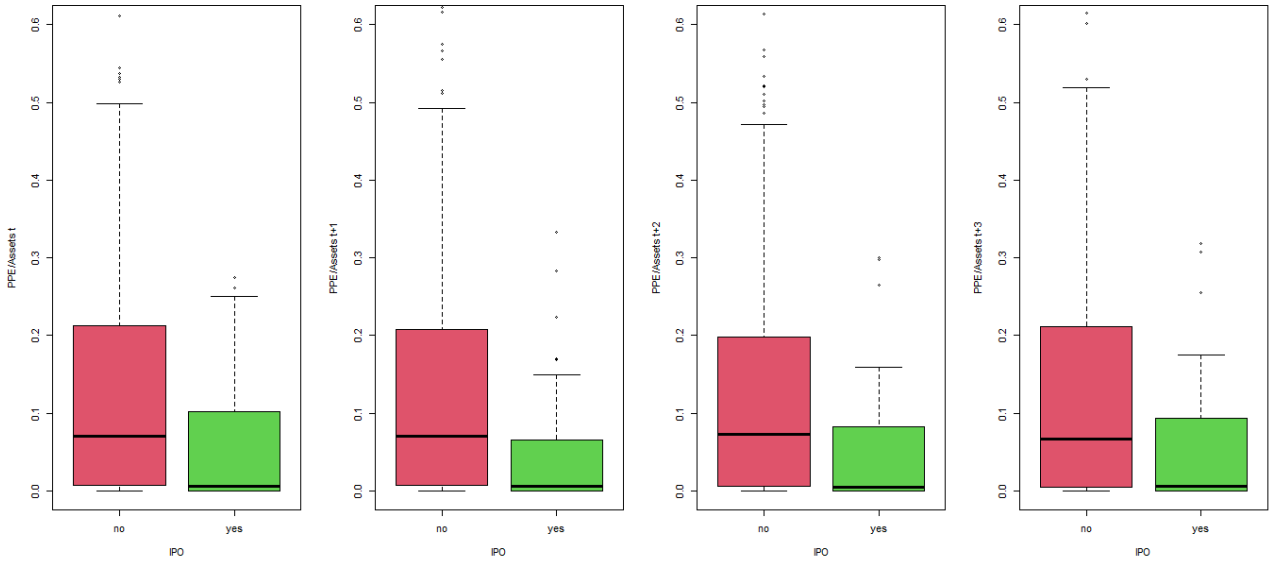


Figure 3.16a: Distribution of intangibles

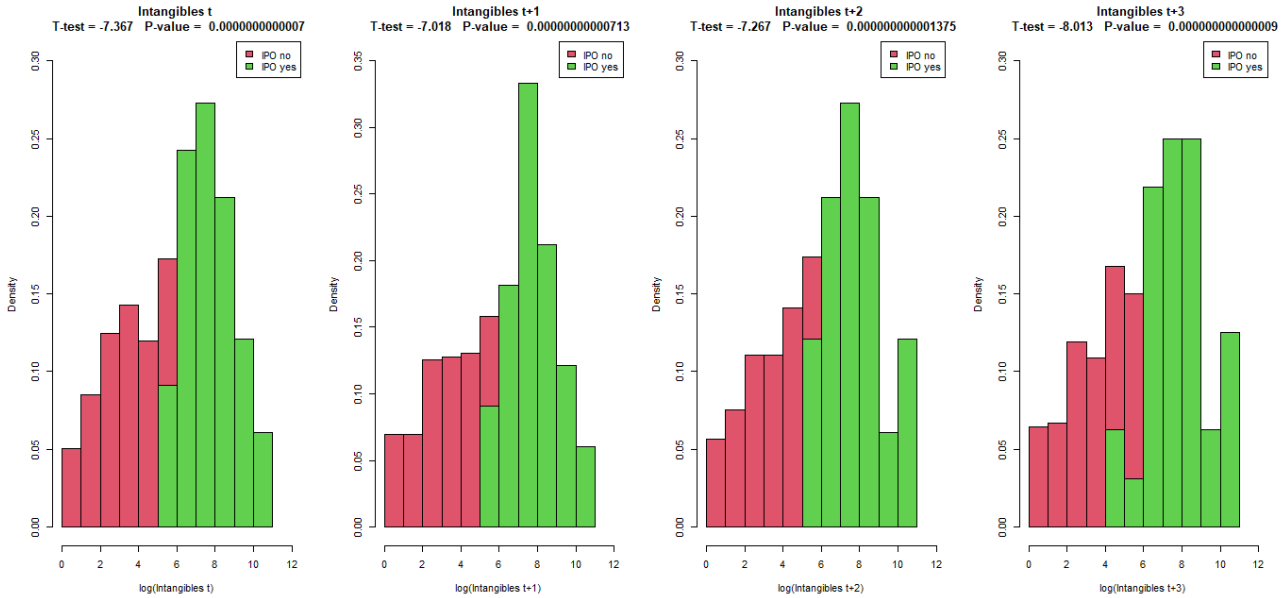
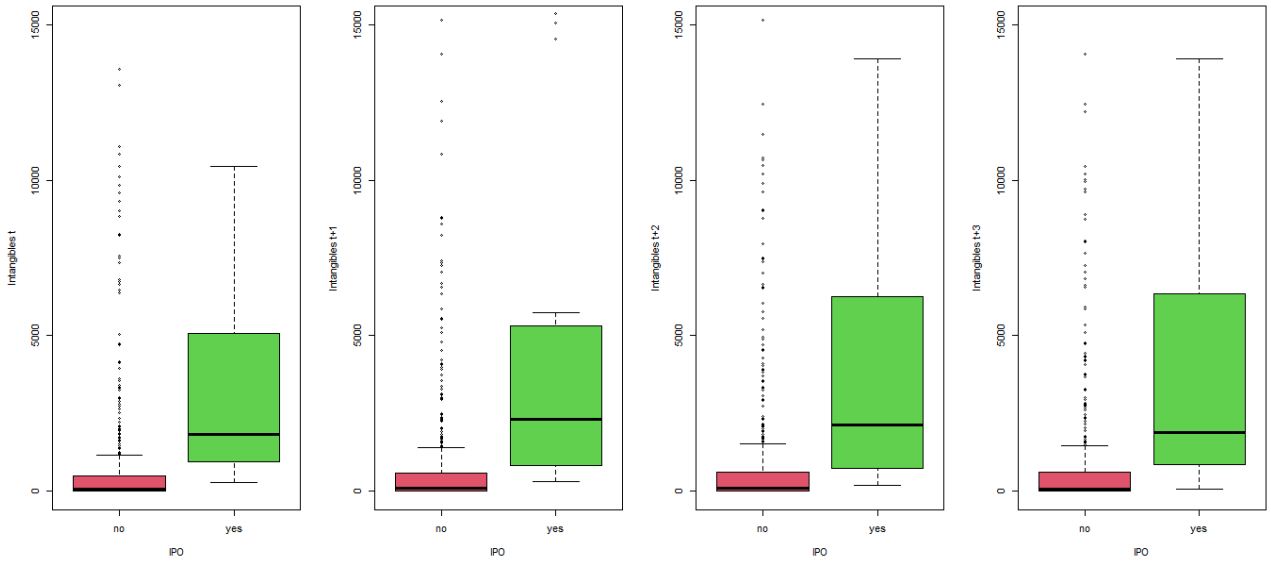


Figure 3.16b: Distribution of intangibles



Efficiency & Profitability

The variables taken in consideration to analyse efficiency and profitability are the following:

- Operating expenses
- Capital intensity & asset turnover
- Profit or loss
- EBITDA/Sales
- ROA
- ROE
- ROI

Operating expenses, the ongoing costs incurred by firms for running normal business operations, can provide a clue on efficiency. The listed firms' operating expenses, in line with the behaviour of revenues, increase from €10 million to €15 million in the post-quotation years. On the other hand, the operating expenses of non-listed firms are constant and below €10 million.

Despite being higher in absolute terms for the listed subsample, operating expenses are not higher in relative terms if compared to revenues. According to the t-test, a non-significant difference in operating expenses exists between the listed and non-listed subsample.

Capital intensity and asset turnover are reciprocal ratios. The former tells the amount of assets required to generate €1 in revenues, the latter reveals the amount of revenues generated by €1 of assets.

The capital intensity ratio is around 2 for AIM-listed companies and around 1 for their non-listed peers. Consistently, the asset turnover ratio is equal to 0.50 and to 0.95, for the listed and non-listed subsample, respectively.
This means that the non-listed firms need to invest less capital to run their business and that the listed firms are less efficient in using assets to produce revenues. Both results are statistically significant, with a p-value equal to 0.001.

If the attention is turned to the pure profit/loss measure, the listed subsample is characterised by a decreasing trend of profits that leads to losses towards the end of the analysed period. In fact, profits are slightly above €150 thousands in year t and fall to –€60 thousands in year t+3. The non-listed firms, instead, do not exhibit a decreasing trend of profits: profits of peers are stable and constant, ranging from €110 thousands to €150 thousands.
Yet, the p-value does not imply a statistically significant difference in profits between the two subsamples. In this respect, the pure profit/loss measure represents an exception because it is the only profitability measure for which a non-significant result of the t-test is obtained; all the profitability indexes mentioned below are significantly different between the AIM-listed and non-listed firms.

The ebitda margin measures a firm's operating profit as a percentage of its revenues. For the listed subsample, the ebitda margin is nearly 10% only in year t and decreases in the susequent years (falling to 6%). By contrast, the ebitda margin of the non-listed subsample is stable in time at about 8%.
Hence, the ebitda margin generally tends to be lower in the AIM-listed companies.

Similar results are confirmed by looking at the classic profitability ratios: ROA, ROE and ROI. ROA indicates the amount of earnings that derive from €1 of assets, thus suggesting how profitable a company is relative to its total assets; ROE is known as the return on net assets and measures the financial performance by dividing net income by shareholders' equity; ROI estimates the efficiency of investments by comparing the amount of return to investment costs. In general, these ratios are lower for the listed subsample. In fact, in year t, the listed firms show ratios that are just slightly lower than those of their non-listed counterparts, but that, in the following years, decrease. On the other hand, non-listed firms' ROA, ROE and ROI are constant during the whole analysed time frame and equal to 4%, 8% and 7%, respectively.

Consequently, a better profitability condition of the non-listed companies is present; while listed firms are characterised by lower profitability ratios, which decrease in time and turn into negative in the last years of analysis.

Figure 3.18a: Distribution of capital intensity & asset turnover

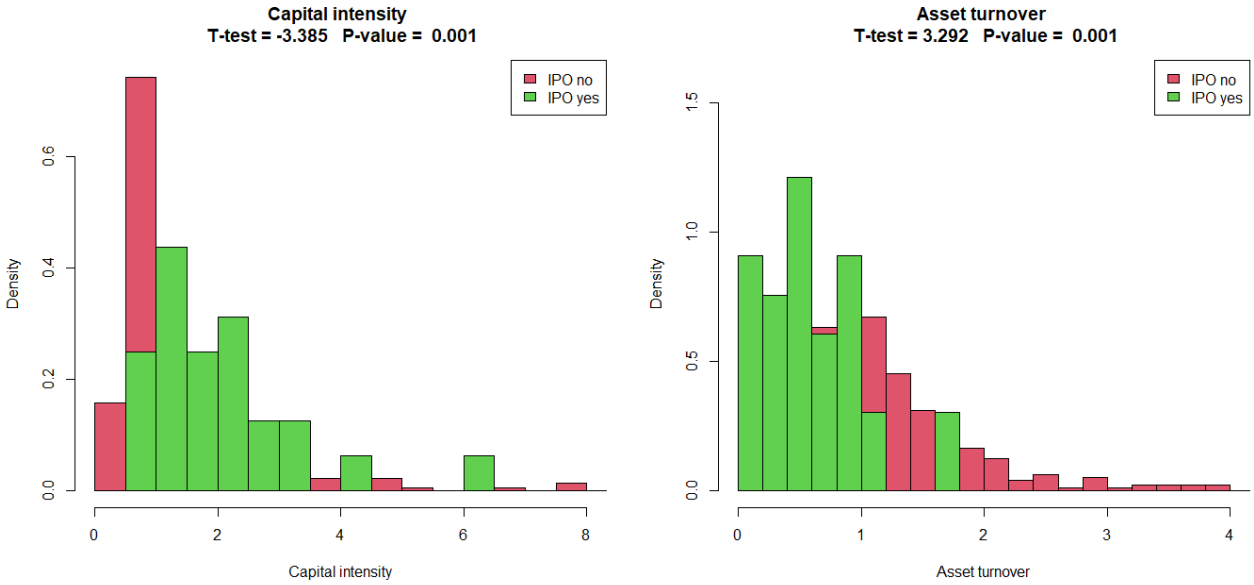


Figure 3.18b: Distribution of capital intensity & asset turnover

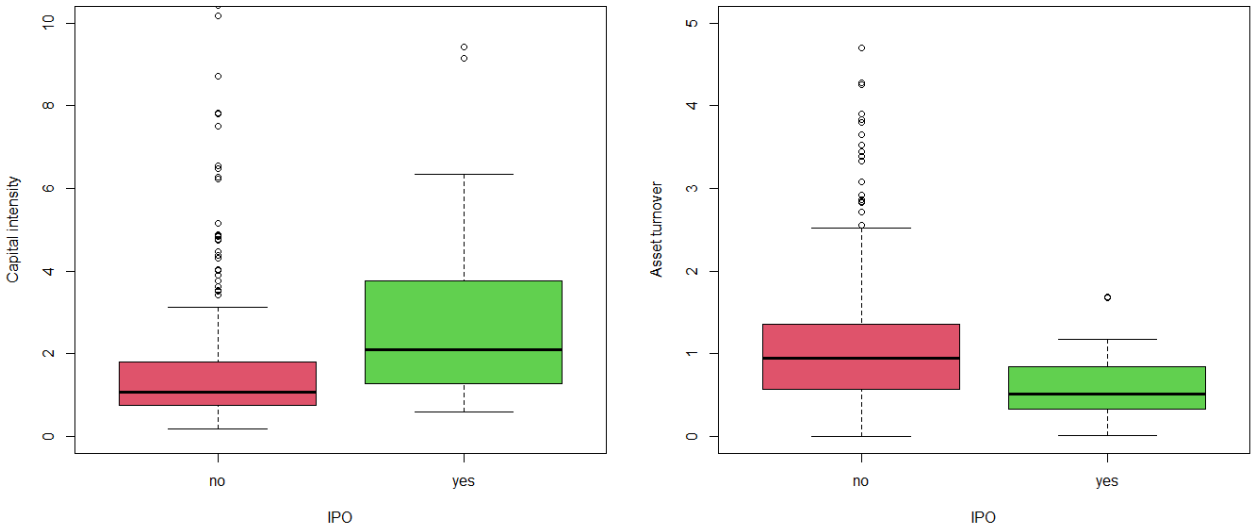


Figure 3.20a: Distribution of Ebitda/Sales

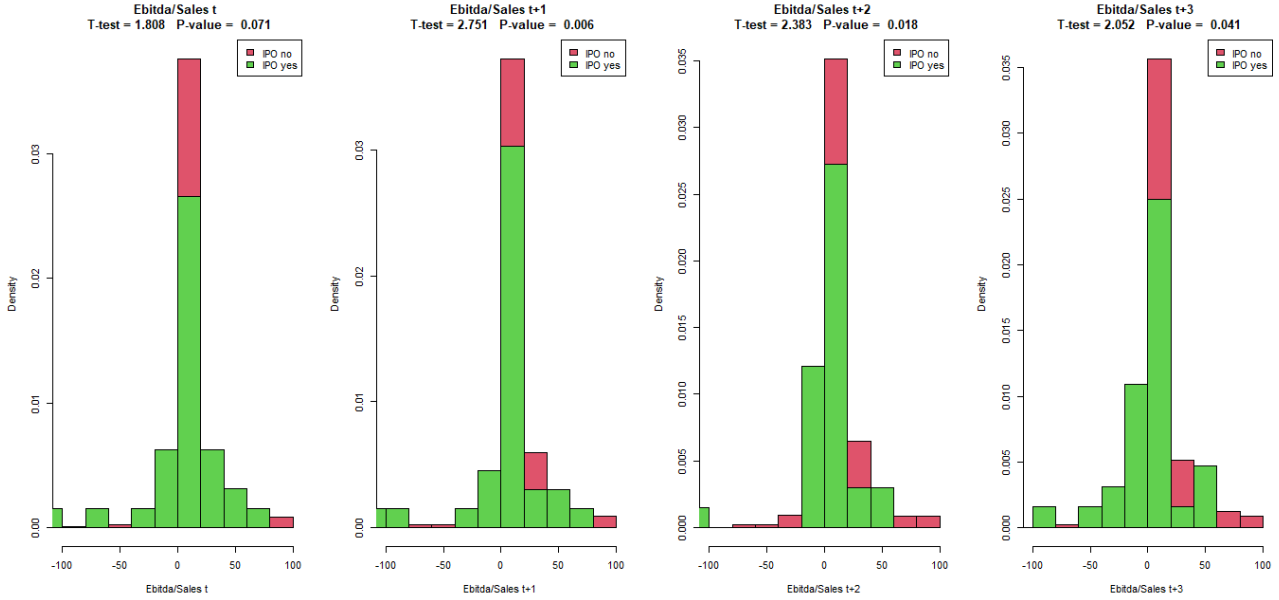


Figure 3.20b: Distribution of Ebitda/Sales

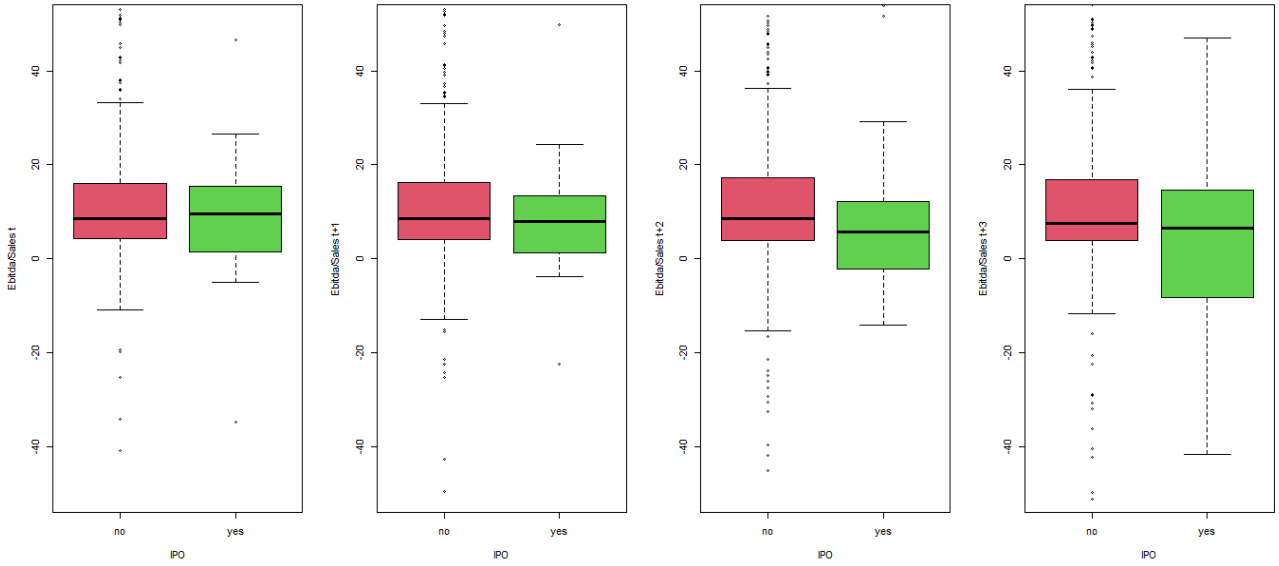


Figure 3.21a: Distribution of ROA

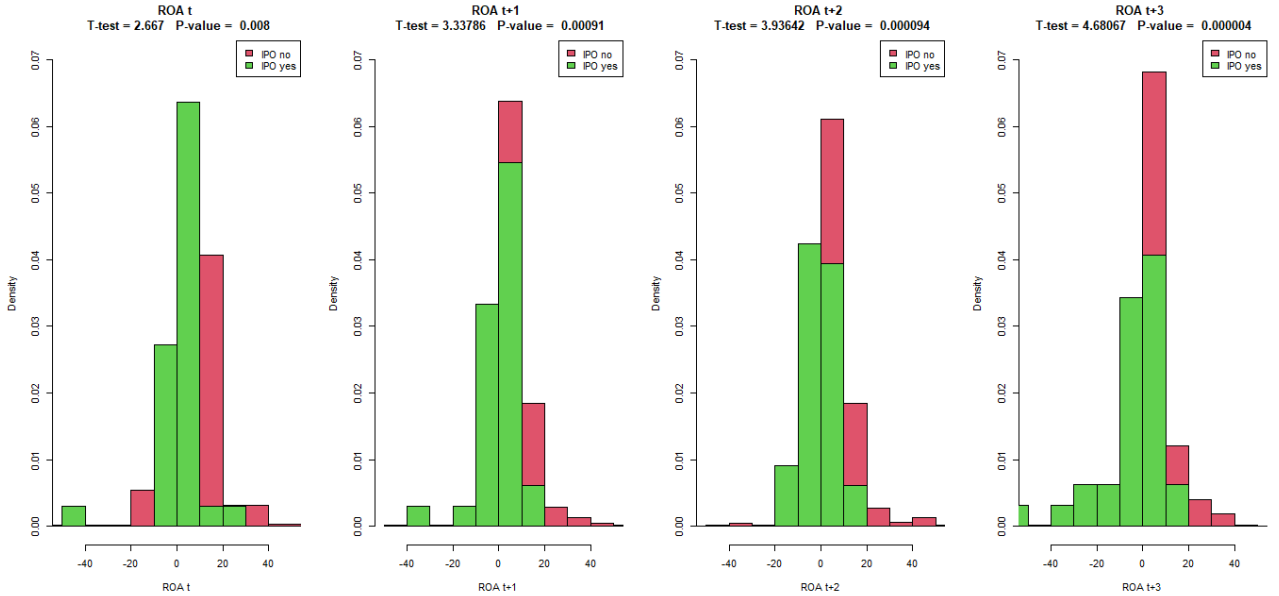


Figure 3.21b: Distribution of ROA

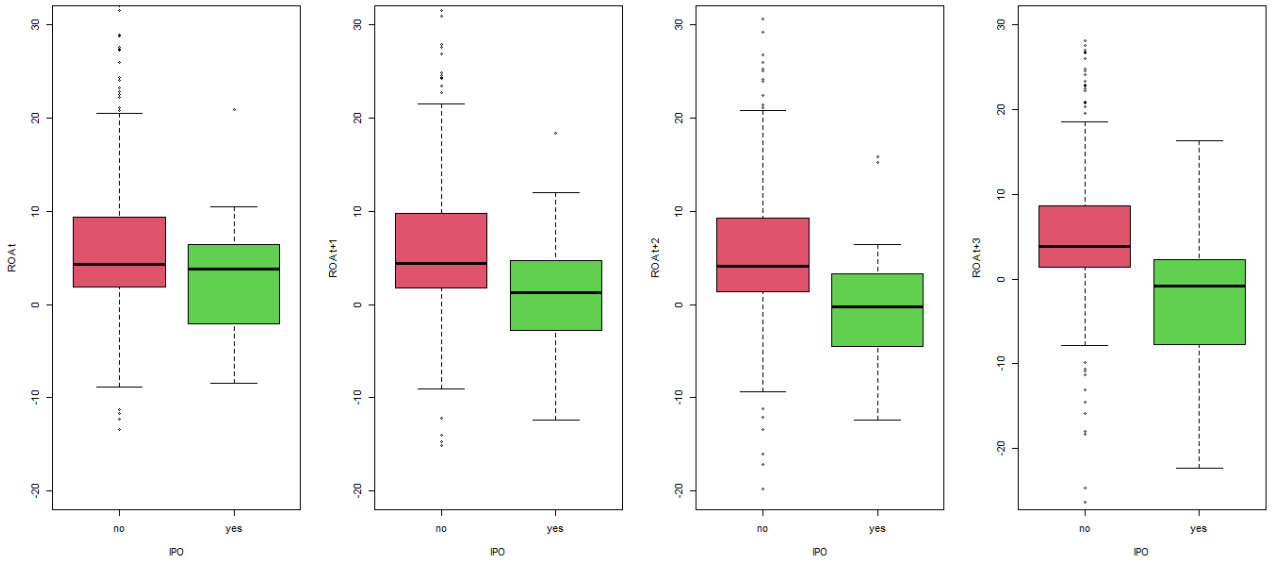


Figure 3.22a: Distribution of ROE

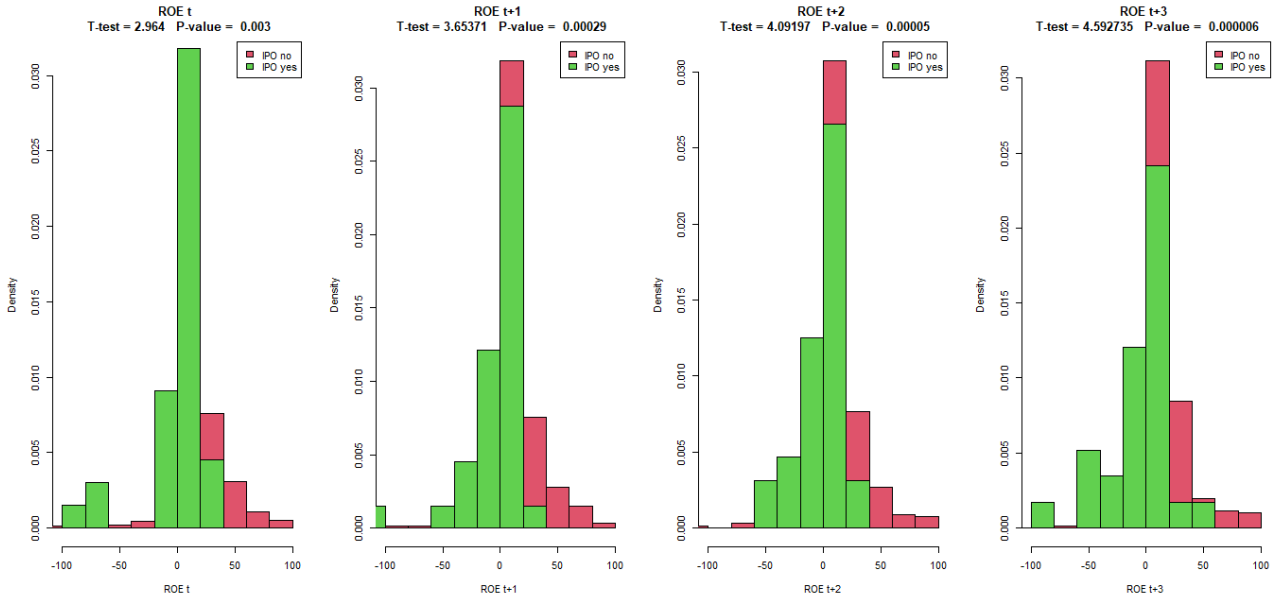


Figure 3.22b: Distribution of ROE

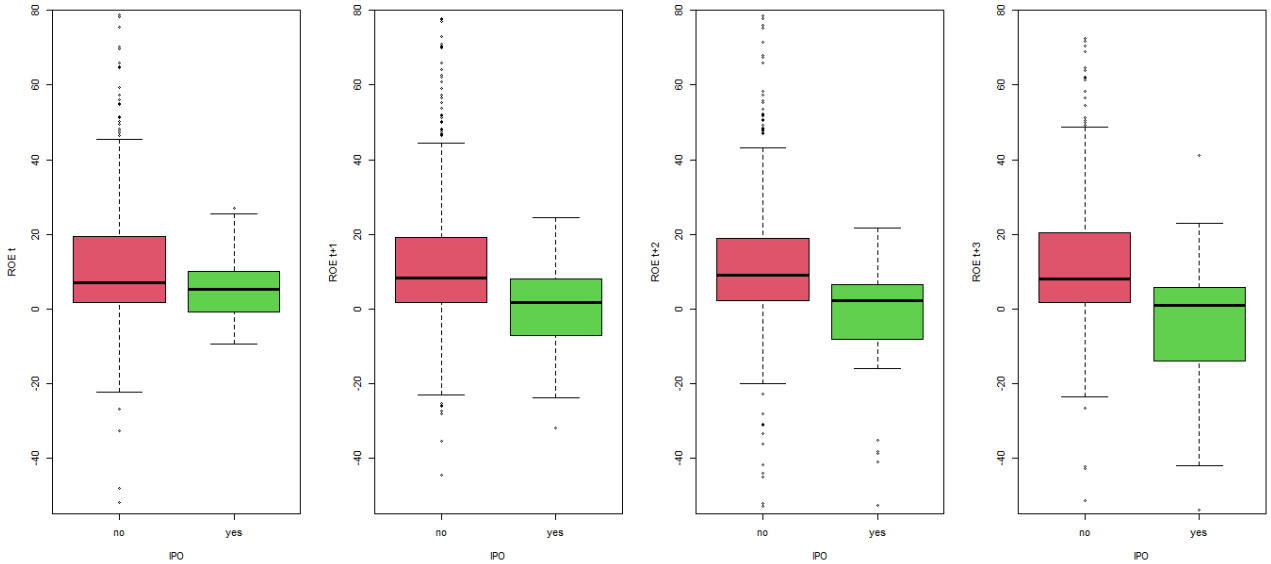


Figure 3.23a: Distribution of ROI

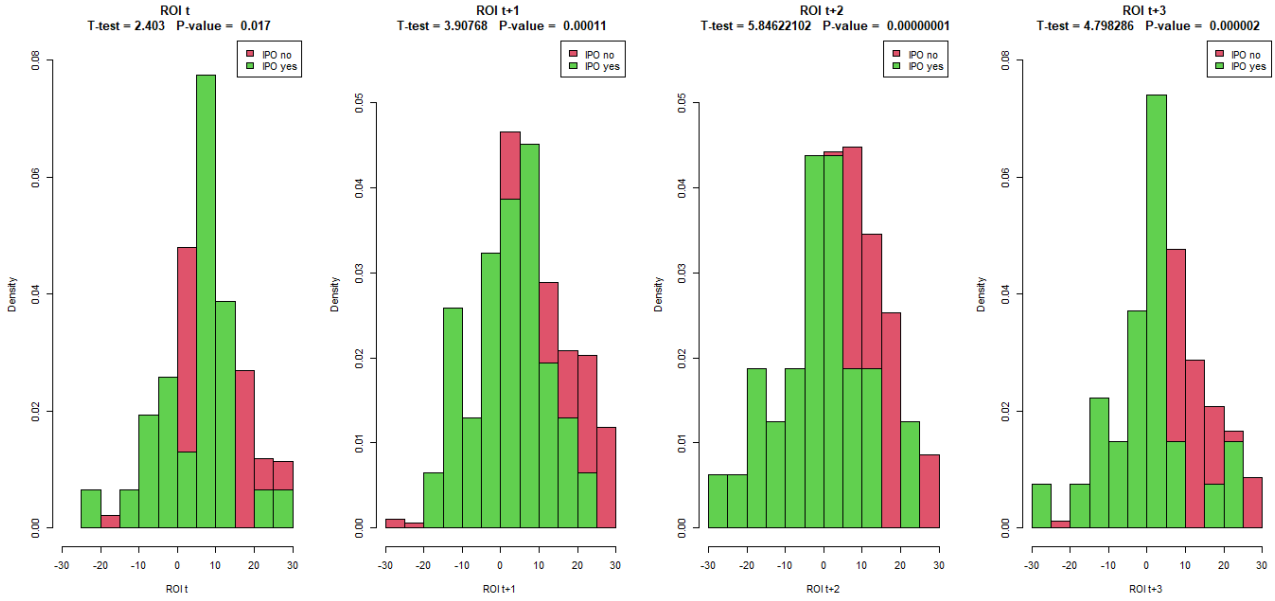
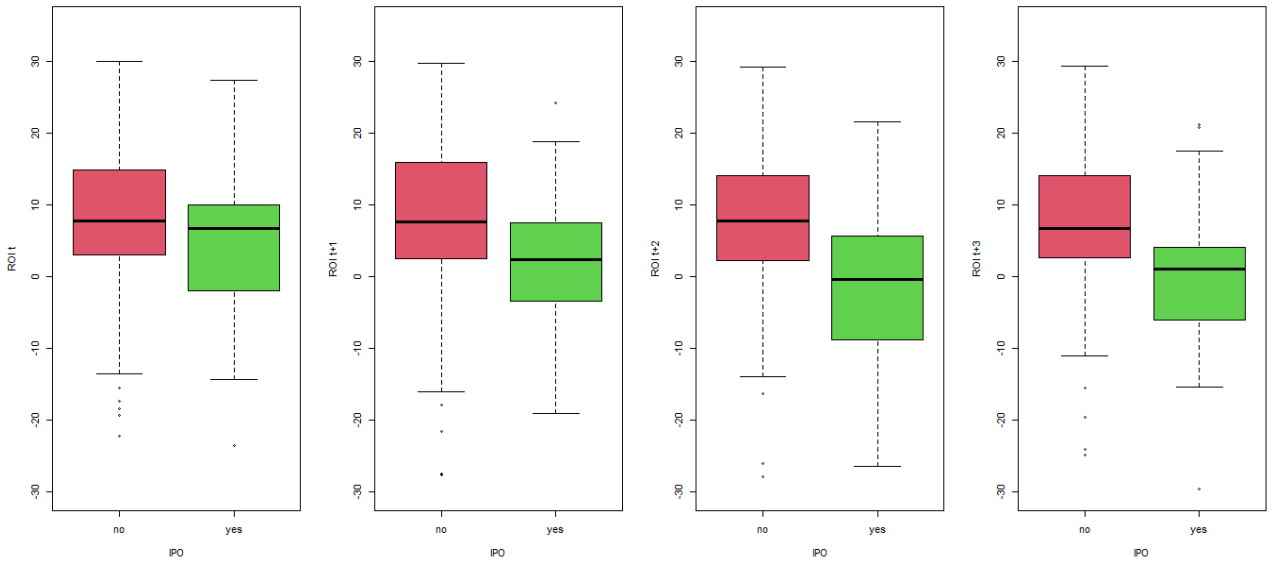


Figure 3.23b: Distribution of ROI



Financial structure & liquidity

The variables taken in consideration to analyse the financial structure and liquidity are the following:

- Equity & NFP
- D/E
- Debt/Ebitda & NFP/Ebitda
- Interest coverage ratio
- Short-term liabilities/Liabilities
- NWC & Current ratio

On average, the listed subsample has more than €10 million of equity. The same figure varies between €2 million and €3 million for the non-listed subsample. Not surprisingly, there is a higher shareholders' stake in public companies: equity is significantly higher for the AIM-listed firms.

To evaluate the financial health of companies, the NFP plays a key role. The NFP is an indicator of both liquidity and solvency, which is used to determine the overall level of debt of companies and, consequently, their ability to meet debt obligations. In fact, by comparing debt to liquid assets, the NFP suggests whether a company is overleveraged.

The listed subsample is characterised by a highly variable positive NFP, of around €1 million in year t and of nearly twice as much in year t+3 (about €2 million). Instead, the non-listed subsample exhibits a positive and stable NFP of slightly less than €500 thousands. For both subsamples, the positive sign of the NFP indicates the firms' net exposure to lenders; in other words, since both listed and non-listed firms have more debt than liquid assets on their balance sheet, this means that they hold insufficient liquid and financial resources to pay off debt.

According to the t-test, no significant difference in the NFP exists between the AIM-listed firms and their peers. Actually, even if the NFP of listed companies is higher, the share of NFP on total assets is similar between the two groups.

The D/E ratio is a metric used in corporate finance to evaluate financial leverage. It measures the extent to which a firm finances its business through debt, compared to wholly-owned funds. The leverage of the listed subsample is stable in time at about 0.4, while that of the non-listed subsample is stable and slightly higher (at about 0.5). The leverage measure is not significantly different between the AIM-listed and non-listed firms: no more than half of the firms' assets are financed by debt.

The debt-on-ebitda ratio measures the amount of earnings generated and available to cover debt before paying interest, taxes, depreciation and amortization expenses.

The listed firms' debt-on-ebitda ratio is generally a bit lower than that of non-listed firms. More specifically, the debt-on-ebitda ratio of AIM-listed companies is always below 1.5, while the debt-on-ebitda ratio of non-listed companies stays stable at 1.5 during the whole post-listing period. Thus, both subsamples manifest good conditions as for debt load.

Yet, it is worth to note that listed companies exhibit a particularly promising debt-on-ebitda ratio (equal to 0.5) in year t. In this respect, the listing year is the only year with a statistically significant difference in the debt-on-ebitda ratio between the two subsamples.

Similarly, also NFP-on-ebitda gives an indication of a firm's ability to pay off its incurred debt: this measure gives a clue about how many years are needed for a company to repay its debts using ebitda.
The listed subsample is characterised by a highly variable NFP-on-ebitda, with a peak at about 0.9 in year t+1. A lack of stability in the NFP-on-ebitda is also present for the non-listed subsample: the NFP-on-ebitda varies from 0.5 in year t to a maximum of 0.9 in the two subsequent years, and then falls back to 0.6 in year t+3.
All in all, non-significant differences are present between the two groups, signaling that the whole sample has similar ability to repay the debt owed. Actually, the sample is able to repay debt using ebitda within less than one year.

The interest coverage ratio is calculated by dividing earnings before interest and taxes by the interest payments which are due for the same period. The higher the ratio, the easier it is for a company to make interest payments on its debt.
The listed subample is characterised by an interest coverage ratio equal to 5, while that of the non-listed subsample is about twice as much. In other words, companies earn five to ten times more than they have to pay out in interest. This means that the sample generates enough earnings to cover its minimum debt expenses, hence providing an indication on the sample's financial stability.

The share of short-term liabilities on total liabilities indicate the reliance of firms on short-term funding. In this respect, it is important to recall that reliance on short-term funding makes firms more vulnerable to liquidity shocks, since debt facilities can be withdrawn immediately, and to rising interest rates.
The listed subsample is characterised by a decreasing trend of the share of short-term liabilities: during the analysed period, the share drops from around 0.9 to 0.75. On the other hand, the share is constant at 0.9 for the non-listed subsample. Thus, short-term funding is similar in the first two years under analysis, but becomes significantly different in the last two years.

The NWC, the difference between current assets and current liabilities, helps to evaluate the liquidity and short-term financial health of companies. It provides a cash cushion against unexpected expenses and can be reinvested in the firm's growth.
The NWC of listed firms is in the range of €2 million to €3 million, while that of non-listed firms is slightly above €1 million. Having a positive NWC corresponds to having the possibility to invest in future activities and growth, on top of funding current operations. The t-test reports

that a statistically significant difference in NWC exists between AIM-listed and non-listed firms.

In the same way, the current ratio – also known as working capital ratio – is a liquidity ratio that measures the ability of companies to cover short-term debt obligations by using current assets.

During the analysed period, the current ratio of the listed firms ranges between 1.4 and 1.7; the current ratio of the non-listed firms is slightly lower, ranging between 1 and 1.4. In addition, for both subsamples, the current ratio is highest in the first two years.

Overall, although the current ratio is higher for the listed companies, such measure is not significantly different between the two subsamples. Hence, the whole sample seems to be encountering no difficulty in covering near-term obligations.

Figure 3.24a: Distribution of equity

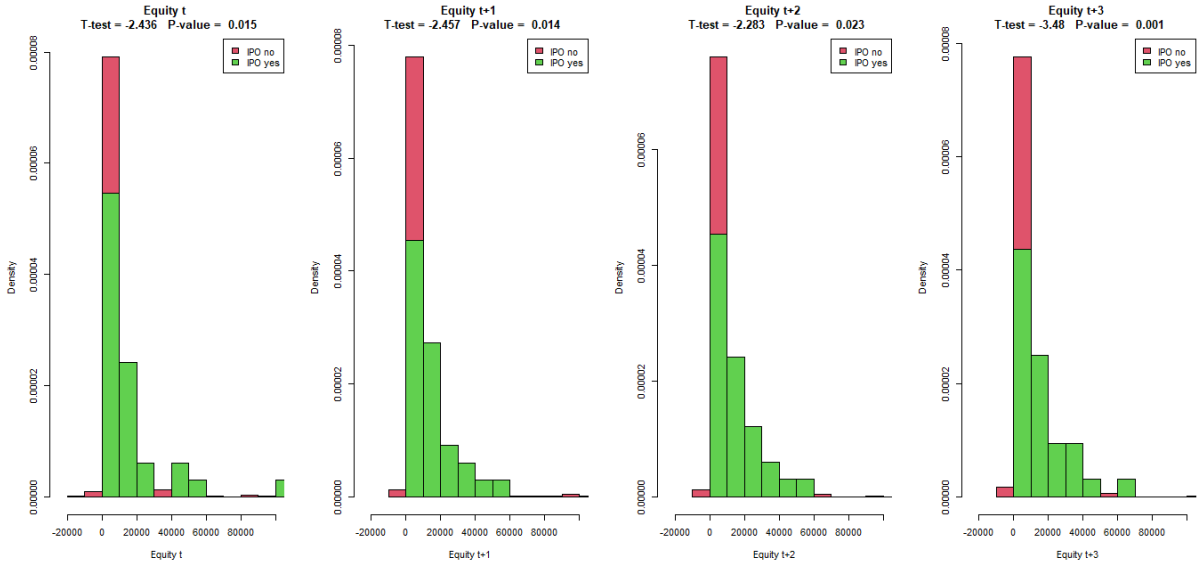


Figure 3.24b: Distribution of equity

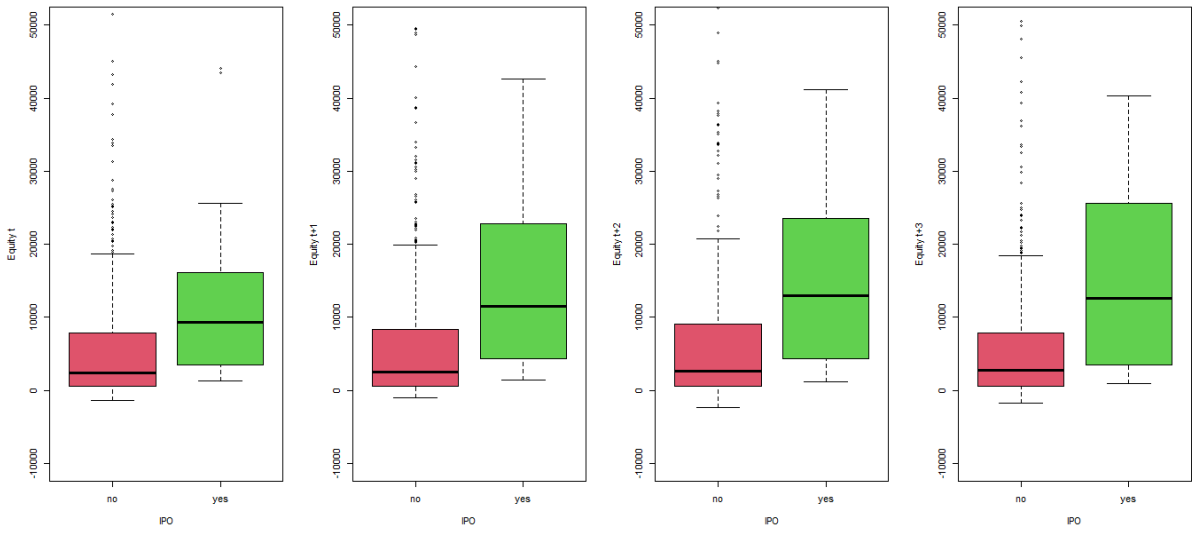


Figure 3.27: Distribution of Debt/Ebitda

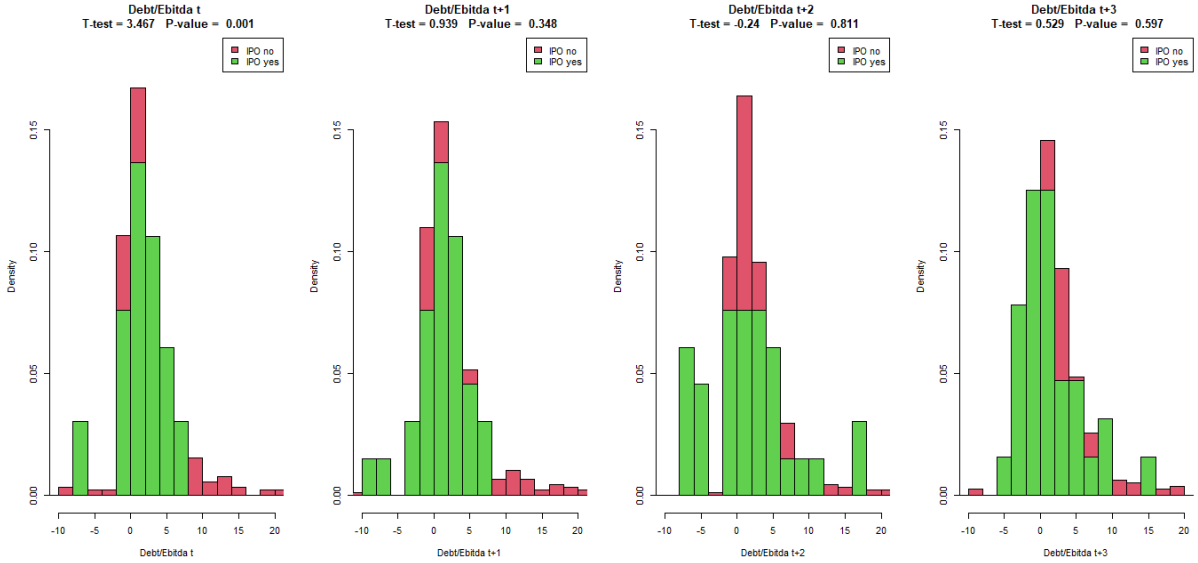


Figure 3.30: Distribution of Short-term liabilities/Liabilities

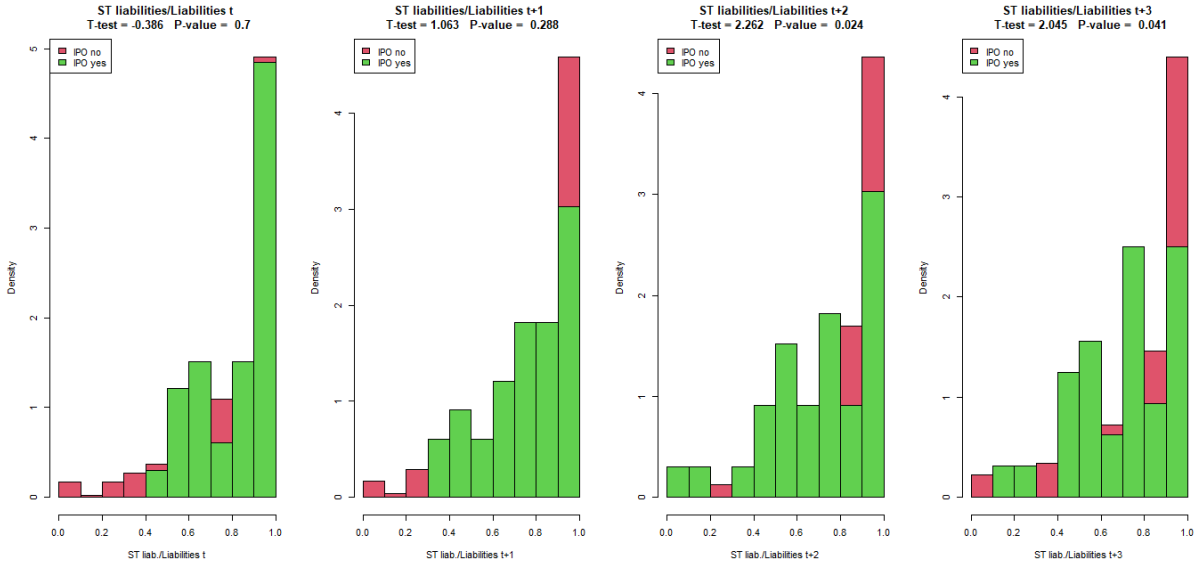


Figure 3.31a: Distribution of NWC

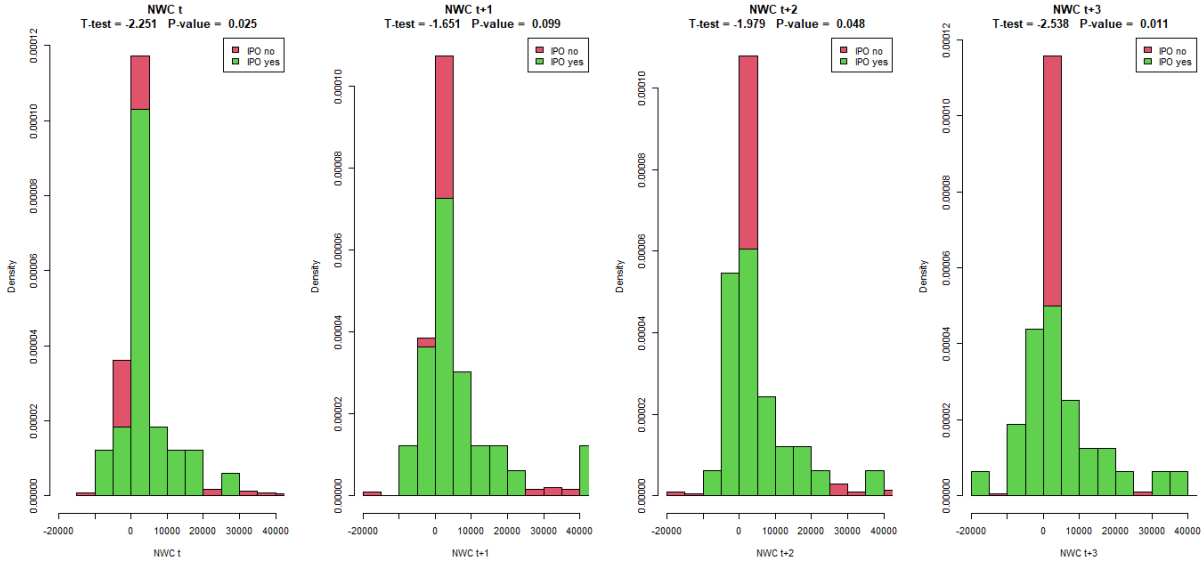
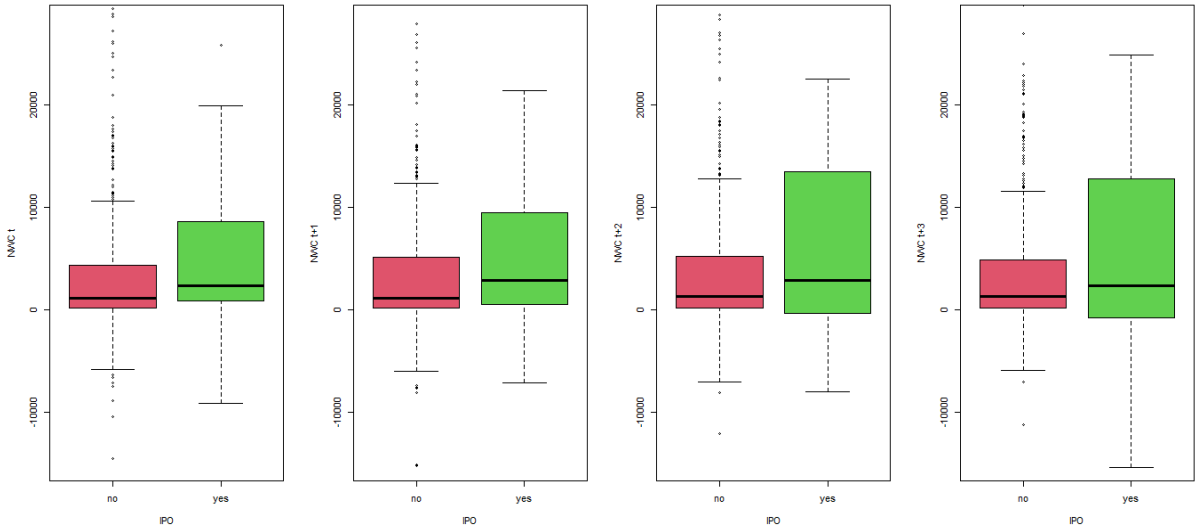


Figure 3.31b: Distribution of NWC



3.4 Statistical analysis[67]

The previous paragraph has dealt with the sample's descriptive statistics. The distribution of each quantitative variable has been drawn for listed and non-listed firms, by using histograms and box plots, and the t-test has been conducted. The graphical representation has been provided as a means to visually perceive the differences existing between the two subsamples.
However, running only the t-test does not give a complete view. For this reason, I have recurred to a second and more sophisticated statistical tool to gain further insight into the effects of listing on AIM Italia: the multiple linear regression. In particular, the aim is to construct a model where the IPO decision is the independent variable X and profitability is the response variable Y.

The three main details about the multiple linear regression are listed below.
-Two linear models have been created, where the dependent variable Y is a profitability measure: ROA and ROI.
-The predictor variable of interest is IPO, a dichotomous variable which takes values 'yes' or 'no'.
-A series of other independent/control variables, which could potentially impact on profitability, have been included in the model. These variables are needed to improve the accuracy of the estimates and have been selected so that they belong to the main macro-categories examined (general characteristics, size and growth, efficiency, financial structure and liquidity). Of course, the control variables are the same for the two linear models:

[67] All the figures of paragraph 3.4 are *Personal elaborations*.

Ateco + Innovative SME + International + Assets growth + log(Revenues) + Sales growth + PPE/Assets + Asset turnover + NFP/Assets + Equity/Assets + Debt/Ebitda + Short-term liabilities/Liabilities + NWC

In total, the independent/control variables are 13 (3 categorical and 10 quantitative). In addition, as mentioned in the descriptive analysis, let's keep in mind that some of these control variables – the ones underlined – are significantly different between listed and non-listed firms.

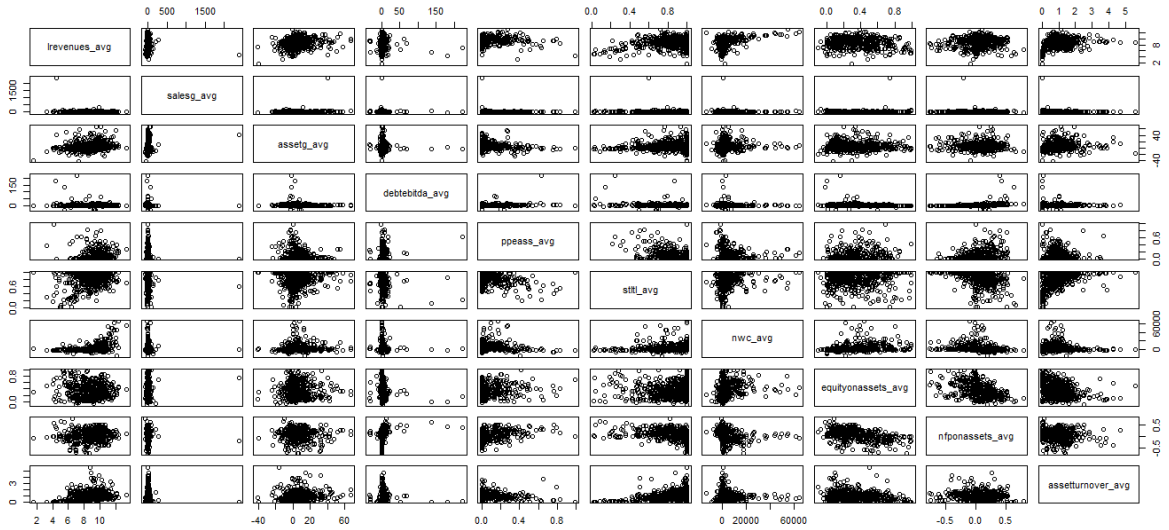
By computing the correlation matrix, it is possible to check that highly correlated independent variables are not included within the same model. In fact, absence of correlation between the quantitative covariates selected for the model means avoiding the collinearity problem. In this respect, I have decided to exclude operating expenses from the model because of its high correlation with revenues (97%) and assets (87%), which could have negatively affected the model.

Actually, the matrix of correlations among predictors (Table 3.6) shows that the variables that I have included in the model are not correlated among each other. In addition, the scatterplot of the predictors (Figure 3.33) provides the graphical representation of the just-mentioned outcome.

Table 3.6: Correlation matrix of predictors

	1	2	3	4	5	6	7	8	9	10
1*lrevenues_avg*	1.0000	-0.2387	0.1420	-0.0794	-0.1256	0.1749	0.4627	-0.0828	0.1271	0.3189
2*salesg_avg*	-0.2387	1.0000	0.2024	-0.0211	-0.0615	-0.0892	-0.0418	-0.1199	-0.0699	-0.1144
3*assetg_avg*	0.1420	0.2024	1.0000	-0.0607	-0.2529	0.0361	-0.0067	-0.0769	0.0175	0.0948
4*debtebitda_avg*	-0.0794	-0.0211	-0.0607	1.0000	0.1900	-0.2548	-0.0511	-0.0780	0.2429	-0.0739
5*ppeass_avg*	-0.1256	-0.0615	-0.2529	0.1900	1.0000	-0.4132	-0.1165	0.1302	0.2642	-0.1556
6*stltl_avg*	0.1749	-0.0892	0.0361	-0.2548	-0.4132	1.0000	0.0626	0.0685	-0.4222	0.3320
7*nwc_avg*	0.4627	-0.0418	-0.0067	-0.0511	-0.1165	0.0626	1.0000	0.3071	-0.2456	-0.1173
8*equityonassets_avg*	-0.0828	-0.1199	-0.0769	-0.0780	0.1302	0.0685	0.3071	1.0000	-0.3914	-0.1920
9*nfponassets_avg*	0.1271	-0.0699	0.0175	0.2429	0.2642	-0.4222	-0.2456	-0.3914	1.0000	-0.0004
10*assetturnover_avg*	0.3189	-0.1144	0.0948	-0.0739	-0.1556	0.3320	-0.1173	-0.1920	-0.0004	1.0000

Figure 3.33: Scatterplot of predictors



The multiple regression models are presented in Table 3.7.

$$ROA \sim \beta_0 + \beta_1\, IPO + \beta_2\, Ateco + \beta_3\, Innovative\ SME + \beta_4\, International + \beta_5\, Assets\ growth + \beta_6\, log(Revenues) + \beta_7\, Sales\ growth + \beta_8\, PPE/Assets + \beta_9\, NFP/Assets + \beta_{10}\, Equity/Assets + \beta_{11}\, Debt/Ebitda + \beta_{12}\, Short\text{-}term\ liabilities/Liabilities + \beta_{13}\, NWC + \beta_{14}\, Asset\ turnover$$

Having a look at the model's estimated betas and at their significance levels, the main results are:

- The independent variables of the linear model that, to a different degree, have a statistically significant impact on ROA, are: IPO, some specific sectorial activities, innovative SME, international, assets growth, the logarithmic transformation of revenues, NFP/assets, equity/assets, NWC and asset turnover.
- A significant positive impact on ROA is determined by the variables assets growth, the logarithmic transformation of revenues, equity/assets, NWC and asset turnover.
- A significant negative impact on ROA is determined by the variables IPO, innovative SME, international, NFP/assets.

$$ROI \sim \beta_0 + \beta_1\, IPO + \beta_2\, Ateco + \beta_3\, Innovative\ SME + \beta_4\, International + \beta_5\, Assets\ growth + \beta_6\, log(Revenues) + \beta_7\, Sales\ growth + \beta_8\, PPE/Assets + \beta_9\, NFP/Assets + \beta_{10}\, Equity/Assets + \beta_{11}\, Debt/Ebitda + \beta_{12}\, Short\text{-}term\ liabilities/Liabilities + \beta_{13}\, NWC + \beta_{14}\, Asset\ turnover$$

Having a look at the model's estimated betas and at their significance levels, the main results are:

- The covariates of the linear model that have a statistically significant impact on ROI are: IPO, some specific sectorial activities, international, assets growth, NWC and asset turnover.
- A significant positive impact on ROI is determined by assets growth, NWC and asset turnover.
- A significant negative impact on ROI is determined by IPO, international.

Table 3.7: Model summary

	ROA	ROI
Variable	Model (1)	Model (2)
intercept	-15.89**	-10.22
	(5.930)	(7.415)
ipoyes	-5.348***	-4.730**
	(1.296)	(1.694)
ateco14	7.677**	4.101
	(2.361)	(3.094)
inno_smeyes	-3.112°	-2.257
	(1.783)	(2.220)
internationalyes	-2.764°	-3.962*
	(1.580)	(1.894)
assetg_avg	0.1305***	0.1063*
	(0.03099)	(0.04450)
lrevenues_avg	1.113*	0.8242
	(0.4817)	(0.5863)
salesg_avg	-0.002334	-0.002214
	(0.002667)	(0.003062)
ppeass_avg	3.026	5.069
	(2.673)	(3.312)
nfponassets_avg	-4.747*	-3.875
	(2.173)	(3.030)
equityonassets_avg	8.700***	0.1647
	(2.401)	(3.546)
debtebitda_avg	0.01318	-0.02580
	(0.02548)	(0.03143)
stltl_avg	-2.698	2.782
	(2.863)	(3.839)
nwc_avg	0.0001762***	0.0001533*
	(0.00004959)	(0.00006762)
assetturnover_avg	1.594°	3.754**
	(0.8469)	(1.130)
R^2 adjusted	0.3551	0.3058

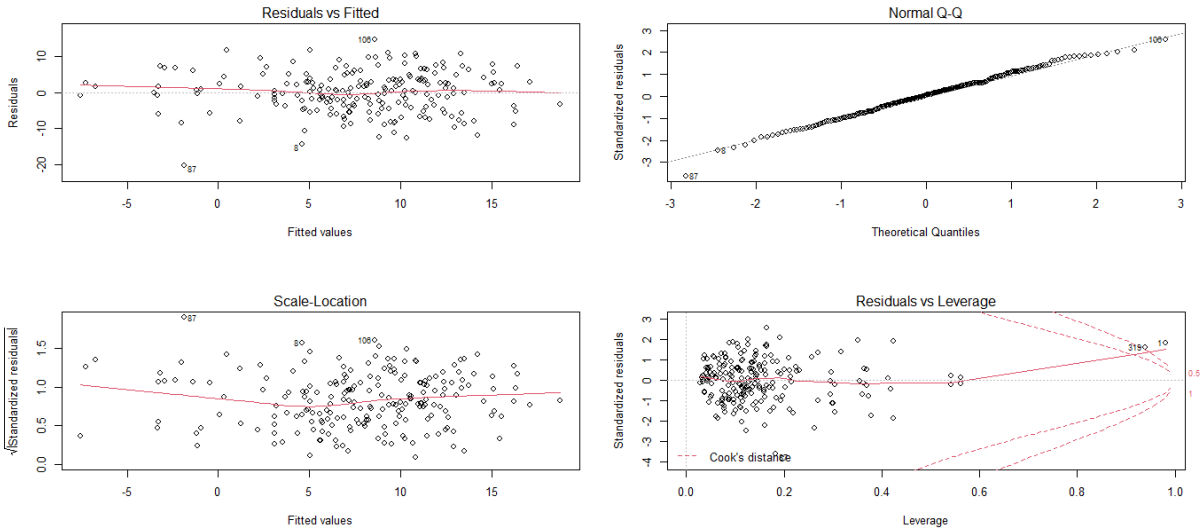
****p < 0.001, **p < 0.01, *p < 0.05, °p < 0.1*

Moreover, by performing the analysis of residuals, I have tested the validity of the results and I have discovered that the linear models satisfy the assumptions quite well. In fact, looking at the residuals gives a clue on whether the assumed model is adequate.

Conscious of the fact that, if the assumptions are incorrect, inferences made with the model can be misleading, the assumptions are verified below and refer to Figure 3.34b[68].

- Upper left plot (linearity): in a good model, the points should not follow an evident pattern and should be randomly distributed around zero, while the red line should be quite flat and lying close to the grey dashed one. Here the distribution looks quite random and around zero, but some outliers are present.
- Upper right plot (normality): errors are normally distributed if the points lie on the grey dashed line, with some deviation expected near the ends. The assumption is supported, except for the presence of some outliers.
- Lower left plot (heteroscedasticity): the assumption is that the variance in the residuals does not change and if the assumption is correct the red line should be flat. The plot suggests that a little degree of heteroscedasticity is present.
- Lower right plot (influential outliers): the leverage value measures the effect of the observations on the regression model and, in this plot, it is possible to see if there are any influential outliers. Some observations with large Cook's distance (>0.5) are present, indicating that there are some outliers in the sample.

Figure 3.34b: Model plot – ROI



Overall, the linear models seem to be satisfying.

[68] In the same way, the verified assumptions also refer to Figure 3.34a, Appendix.

As for accuracy, the model explains around one third of the variability of profitability. More specifically, the adjusted R-squared is equal to 36% and 30%, in the first (ROA) and second (ROI) model, respectively.

In conclusion, to answer the research question on whether listing on AIM offers benefits to firms, the relation between the decision of going public and profitability must be considered. In both models a significant reduction in profitability occurs as a result of the listing choice: the IPO variable determines a reduction of both ROA and ROI. This result confirms the results of the t-test conducted in paragraph 3.3 and is in line with previous literature.

RESULTS OF THE EMPIRICAL ANALYSIS

4.1 Main findings and key considerations

Chapter 3 has illustrated the descriptive and statistical analysis conducted to assess the post-listing performance of companies newly listed on AIM Italia. The analysis has adopted a comparative perspective, always studying the performance of AIM-listed firms with respect to their non-listed peers. The aim is now to provide a brief summary of the most relevant results, together with the answer to my research question. Thus, Chapter 4 intends to understand whether listing on AIM offers benefits to companies.

First of all, it is important to recall that, during the pre-listing years, the AIM-listed companies and their peers were statistically comparable. But, in the post-quotation period, what is the effect of the listing decision?

To answer this question, I have performed the analysis by considering four macro-categories (general characteristics, size and growth, efficiency and profitability, financial structure and liquidity) and by constructing a multiple linear regression. The main and most important outcome is that the decision of listing actually affects the profitability of companies in the post-listing years; yet, before focusing the attention on this result, let's recap the major findings of the descriptive investigation.

1. AIM-listed companies are mainly engaged in communication, manufacturing activities and professional/scientific/technical services. They are mostly located in the North and are, on average, six years younger than their respective peers. Also, it is interesting to note that Innovative SMEs are visibly more numerous among the listed firms: one third of the AIM-listed firms are innovative SMEs, compared to just the 2% of the non-listed subsample.
2. In the post-listing period, AIM-listed firms tend to have non-significantly higher revenues but significantly higher sales growth rates, if compared to their non-listed counterparts; and both assets and assets growth are higher for the listed subsample, even if not significantly. In addition, it is worth to note that the composition of assets is significantly different between the two subsamples: a case in point, intangibles of AIM-listed firms are more than 5 times higher than the intangibles of the non-listed subsample.

Hence, AIM-listed companies tend to be more dynamic and increasing in size, especially in the first two years post-quotation. Non-listed firms, instead, are characterised by a greater stability in trends for the whole analysed period.

3. While a non-significant difference in operating expenses exists post-listing, both capital intensity and asset turnover are significantly different between the listed and non-listed subsample, thus suggesting that the listed firms are less efficient in using assets to produce revenues. These ratios could signal a lower efficiency of the AIM-listed firms, which is not testified by operating expenses.

Moreover, the listed subsample is characterised by a decreasing trend of profits that leads to losses towards the end of the analysed period. In fact, all the examined profitability indexes (i.e. EBITDA/Sales, ROA, ROE, ROI) are significantly different between the AIM-listed and non-listed firms and all go in the same direction: the profitability ratios in the post-listing period are lower and declining for the listed subsample.

In contrast, the non-listed firms exhibit better profitability results characterised by stability in time. Consequently, a worse profitability condition of the listed companies is present.

4. Not surprisingly, there is a significantly higher shareholders' stake in public companies. NWC is positive, and significantly higher for listed firms, denoting the possibility to invest in future activities and growth. Also, while short-term funding is similar in the first two years under analysis, it becomes significantly lower for listed firms in the last two years.

Yet, in general, a part from these exceptions, results for financial structure and liquidity are similar between the two subsamples. In fact, according to the t-test, in the majority of cases no significant differences in financial health exist between the AIM-listed firms and their peers.

For instance, the companies in the sample have not been aggressive in financing their growth with debt: no more than half of the firms' assets are financed by debt. Thus, both subsamples manifest good conditions as for debt load and are not overleveraged.

In addition, the sample has similar ability in meeting debt obligations; actually, it is able to repay debt using ebitda within less than one year. This suggests that firms do not seem to be struggling to pay off their creditors and to cover near-term obligations.

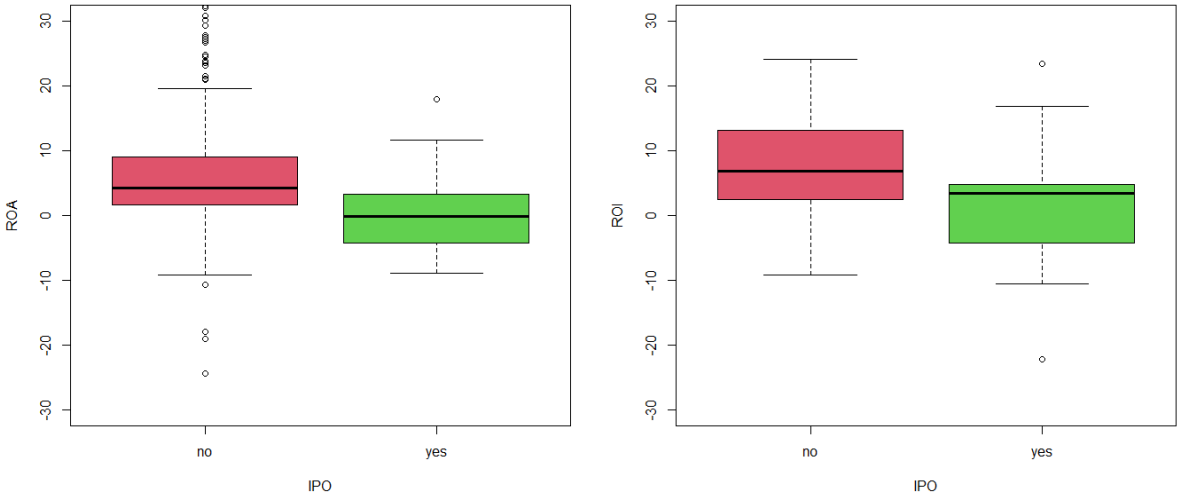
Overall, these results provide a positive indication of adequate liquidity and good overall financial health for the AIM-listed companies and their peers.

The most striking outcome of the descriptive analysis regards the link between listing and decline of profits in the post-listing years. AIM-listed companies' profit measures are not only significantly lower with respect to those of their non-listed counterparts, but also declining in time.

Such finding is also confirmed by the two multiple linear regressions presented in paragraph 3.4. Given the same set of control variables, the IPO decision determines a reduction of both

ROA and ROI[69]. In other words, both models testify that a significant decrease in profitability occurs as a result of the listing choice. In this respect, Figure 4.1 graphically depicts below the just-mentioned outcome: it is possible to note that the distributions of ROA and ROI for the AIM-listed firms (IPO=yes) take lower values if compared to firms that stay private.

Figure 4.1: Distributions of ROA & ROI (listed versus non-listed)



Source: Personal elaboration

Then, it just comes natural to ask ourselves: why does this happen? What drives down the profit measures of AIM-listed companies? Providing an absolute answer to this question is difficult, but hypotheses can be formulated.

To formulate my hypotheses, the starting point of my line of reasoning is represented by the control variables of the linear model. It is worth to recall that, according to the t-test, some of the control variables are statistically different between listed and non-listed firms. Consequently, if I want to look for the driver of post-listing differential performance, I must start by examining the variables that affect profitability and that are statistically different in the two subsamples[70].

Firstly, from the descriptive analysis, it is clear that AIM-listed companies are characterised by overall good financial health. Hence, the positive financial structure and the liquidity position do not explain why listed companies are subject to lower profits. This intuition is confirmed by looking at the estimates of the model: the control variables, which refer to this macro-category and are statistically different between the two subsamples, exhibit signs that go in favour of the

[69] In the models, the beta coefficients for IPO are around -5 and -4, respectively.

[70] As a matter of facts, to find an explanation, considering the variables that are similar between listed and non-listed firms has no sense; conversely, it may be possible to find out why the profitability of AIM-listed firms worsens post-quotation by examining the control variables that are statistically different between the two subsamples.

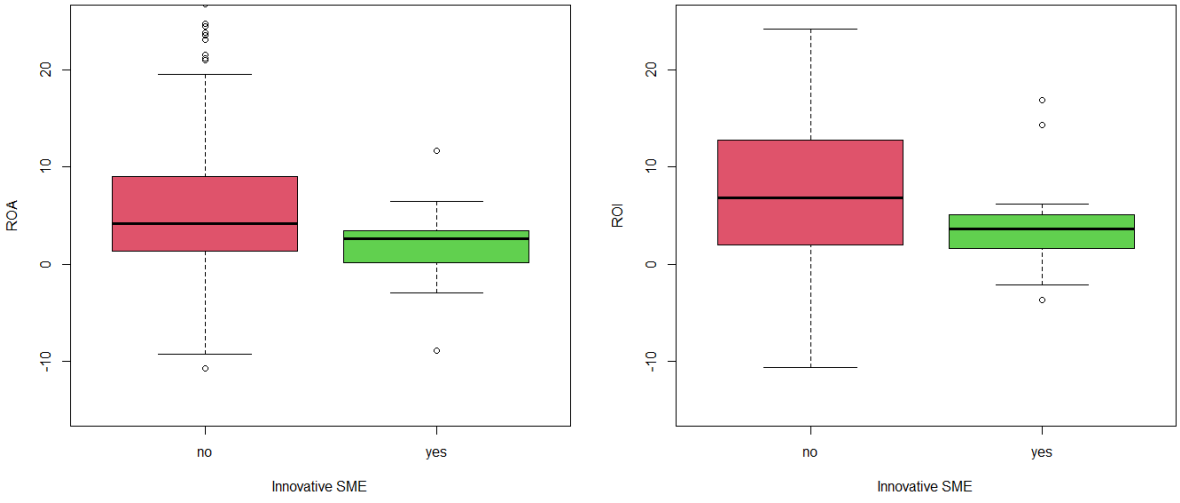
profitability of listed firms. Thus, I can conclude that the motive must be searched for elsewhere.

Size and growth is the second macro-category of analysis that could potentially explain the lower profitability linked to the listing choice. In this respect, the linear regression contains, among others, the control variable sales growth. Sales growth is significantly higher for listed firms and, in the model, is characterised by a negative coefficient, confirming that the higher sales growth of AIM-listed companies has a negative effect on profitability. However, such effect appears to be negligible because sales growth is not a significant variable inside the model.

If attention is shifted to the efficiency dimension, asset turnover could provide us with a clue. In fact, the asset turnover ratio is significantly lower for the AIM-listed subsample, suggesting that the latter is less efficient in using assets to produce revenues. Also, this variable is significant in the multiple linear regression and is associated to a positive coefficient, meaning that the potentially lower efficiency of listed firms directly reflects into a lower level of profitability. However, such apparently reasonable conclusion is questionable because just a moderate[71] correlation seems to be present between asset turnover and profitability.

Last but not least, the general characteristics of the two subsamples must be considered; in particular, the qualitative variable Innovative SME is worth of mention. SMEs characterised by a strong innovation component are more numerous among the AIM-listed firms. In addition, in the linear models this categorical variable takes negative coefficients[72], signalling that being innovative seems to be associated to lower profitability – this intuition is illustrated in Figure 4.2.

Figure 4.2: Innovation versus profitability



Source: Personal elaboration

[71] The correlation between asset turnover and profitability is positive but not strong ($0.3<\rho<0.4$).
[72] The models' beta coefficients for Innovative SMEs are around -3 (significant) and -2, respectively.

This very last result could turn to be relevant to formulate a conclusion. In fact, if compared to the non-listed subsample, AIM-listed companies possess a significantly higher amount of intangibles (e.g. R&D) and are more focused on innovation. Consequently, the AIM-listed firms' greater propensity towards innovation, as part of a long-term looking growth-enhancing strategy, could explain why profitability declines in the short-run (t, t+1, t+2, t+3).
By relying on the previous statement, I can assume that the AIM-listed firms of my sample are not interested in rebalancing their financial structure: their decision to list could be rather linked to the aim of financing innovation and future growth. However, the implementation of growth strategies is likely to compromise profitability, especially in the short term; it is common knowledge that, to achieve an expansion goal in the medium-long term, management has to give up competitive advantage in the short term.

All the above reasoning is an attempt to explain the main and most important finding of my dissertation: listing affects the profitability of companies in the post-quotation years.
The considerations made in the previous pages are not to be intended as absolute truths, but seek to provide food for thought. My suggestions are constructed by relying on the variables collected for the analysis, yet I am aware of the fact that many other non-verifiable factors could contribute to explaining the listed subsample's worse performance.
For sure, the outcome is puzzling and, after reading the results of my research, the reader might be asking himself/herself questions[73]. However, something is absolutely clear: it is very challenging to identify the exact motive for a decline in post-IPO operating performance. In literature, this trend of underperformance is one of the least explained regularities. As mentioned in Chapter 2, to justify this anomaly, academics provide some theoretical – difficult to verify – explanations like the ability to choose the right timing for the quotation, window dressing practices prior to listing or the increase in agency costs after the IPO (Jain and Kini, 1994).

[73] What if the companies, which decide to go public, are worse ex ante? In this respect, Piotroski (2013) claims that the AIM seems to be a 'landing pad for struggling firms' rather than a 'launching pad for highfliers'. Nonetheless, the AIM-listed firms in my sample are comparable pre-quotation to their respective peers, so it is difficult to believe that the listed subsample is worse than the non-listed one ex-ante.
What if the costs of listing impact on short-run profitability? I would exclude this possibility because I believe that, if this were the case, a negative peak in profitability would occur in the quotation year t. Instead, results show that profitability keeps decreasing during all the analysed period.

4.2 Theoretical confirmation and practical implication

The findings of my dissertation thesis are in line with previous literature. The common ground behind the empirical contributions presented in Chapter 2 is the tendency towards a significant worsening of the operating performance of newly listed firms; by analysing the main financial indexes and ratios of my AIM-listed subsample, I have reached similar outcomes.
In this respect, Table 4.1 briefly summarises some of the theories that are consistent with the results of my empirical analysis.

Table 4.1: Summary of the results

Authors	Results
Alexander and Mayer (1991)	As for the financial structure, listed firms finance themselves by raising more equity capital or through medium- and long-term loans; instead, unlisted firms tend to raise short-term loans.
Jain and Kini (1994)	The median operating return on assets decreases in the quotation year and keeps on worsening for a few more years, while the corresponding industry-peers either exhibit stable patterns or decrease to a smaller extent. Simultaneously, the newly-listed firms experience high revenue growth.
Cowling et al. (2002)	The growth patterns of net sales and profits are sharply reduced after the offering.
Khurshed et al. (2003)	Companies going public on the English Official List experience a significant decline, in terms of ROA, ROE and asset turnover, after the IPO.
Carpenter and Rondi (2006)	The post-IPO growth rates of total assets and sales of Italian companies are positive.
Paleari et al. (2008)	Post-listing operating underperformance is testified by a permanent and significant drop in profitability, measured in terms of return on assets and return on equity.
Revest and Sapio (2014)	While, on the one hand, an overall positive influence of the AIM on company size is reported, on the other hand, the productivity growth (e.g. value added per employee) of AIM-listed companies is slower (-20.7%) than that of private companies.
Doukas and Hoque (2016)	A poor post-listing operating performance of AIM firms is reported: AIM UK firms are loss-making.

Source: Personal elaboration

Yet, recall that the majority of Chapter 2 has been dedicated to the analyses of post-listing effects on main markets, because relatively little attention from the empirical literature has been

given to companies that go public on the AIM. Thus, it is interesting to note that matching findings do exist anyway: even if theory focuses on main markets while my empirical research is based on a secondary market, post-listing effects seem to be the same. I could then infer that the effect of listing does not vary depending on the type of market under consideration. Also, by relying on studies made on main markets, constructing expectations about the effectiveness of listing on AIM Italia seems to be reliable.

In conclusion, studying the post-listing effects can provide useful information about changes in the economic-financial performance experienced by newly-listed firms. Actually, from a practical point of view, conducting this type of analysis is useful for business consultancies. For instance, by relying on the findings of my empirical research, it is possible to give some advice to all those SMEs that are considering listing on AIM Italia – and to those that will consider doing so in the future.

According to Chapter 3, the listing decision seems to negatively affect profitability: the effect of the IPO on ROA and ROI is negative and significant. In other words, listed SMEs appear to be characterised post-quotation by worse performance indicators with respect to non-listed companies. Thus, the main outcome of my dissertation questions the existence of a beneficial impact of listing on AIM Italia – as regards operating performance. In fact, since the AIM-listed firms' profits are lower and declining in the short-run, listing appears to be risky[74] for SMEs. Therefore, based on the just-mentioned evidence, my prudent recommendation to Italian SMEs is to avoid listing – if distressed or if their objective is that of increasing short-term profit measures.

However, a further consideration must be made: my empirical research has a limitation because it focuses just on the quotation year and on the three post-listing years. Given that the complete post-listing effects are detectable only after a rather long period of time, the longer term should also be examined to provide a surely reliable practical advice. By shifting the focus away from short-term results, what could emerge is that the short-run underperformance is the cost to be borne in order to achieve an expansion goal in the medium-long term. If this were the case, listing would represent the correct choice. For this reason, I believe that further research on this topic is important.

My suggestions for future research regard studying the causes of post-listing underperformance and the long-term effects of listing on AIM Italia. Understanding the specific driver behind the

[74] Of course, any company considering the possibility of going public makes a cost-benefit analysis and the final listing choice could be driven by non-financial reasons too.

post-listing underperformance phenomenon together with adopting a long-run perspective is, in fact, necessary to give to Italian SMEs an indisputable practical recommendation.

CONCLUSION

The empirical analysis on the effectiveness of listing on the AIM Italia has been performed with the aim of assessing whether going public offers benefits to the Italian small-sized companies. To address this research question I have examined the post-listing performance of companies newly listed on the AIM Italia by adopting a comparative approach. In other words, I have selected a sample of AIM-listed companies and I have identified a number of non-listed firms that were comparable (on the base of industry, size, profitability and governance structure) during the pre-listing years; in this way, I have created a final sample consisting of 33 listed companies and 484 comparable firms. Subsequently, by studying the performance of AIM-listed firms with respect to that of their respective peers, I have detected if significant differences in corporate performance exist in the post-listing period.

To gain some insights into the effects of the listing decision, four macro-categories – general characteristics, size and growth, efficiency and profitability, financial structure and liquidity – have been analysed and a multiple linear regression has been constructed.
The most striking outcome of my analysis regards the link between listing and decline of profits in the post-listing years. The IPO decision seems to determine a reduction of both ROA and ROI, testifying that a significant decrease in profitability occurs as a result of the listing choice. Thus, listed SMEs appear to be characterised post-quotation by worse performance indicators with respect to non-listed companies. In addition, AIM-listed companies' profit measures are not only significantly lower with respect to those of their non-listed counterparts, but are also declining in time. Consequently, since the AIM-listed firms' profits are lower and declining in the short-run, going public on the AIM Italia could be risky. These are the main insights into the effects of listing on the AIM Italia gained from my dissertation.
Furthermore, it is worth to recall that my finding is in line with previous literature. By analysing the main financial indexes and ratios, a majority of authors seem to witness, after the IPO, poorly performing firms. Several studies document that the accounting performance of IPOs undergoes a significant deterioration and that companies experience a drop in profitability in the post-quotation period. Hence, the outcomes that I have reached for the AIM Italia are similar to those achieved by scholars for main markets.

In conclusion, the results of my dissertation thesis question the existence of a beneficial impact of listing on the AIM Italia – as regards operating performance. In fact, if I consider the short-term results of my empirical analysis, the benefits of IPO firms in terms of profitability are

dubious. However, my research has a limitation because it focuses just on the quotation year and on the three post-listing years. Given that the complete post-listing effects are detectable only after a rather long period of time, the longer-term should also be examined by future researchers in order to provide Italian firms with absolutely reliable practical recommendations.

[1] All Tables/Figures in the Appendix are *Personal elaborations*

APPENDIX[1]

Table 3.3: Final sample

AIM company	Peer company
AMBROMOBILIARE S.P.A.	RECONSULT S.R.L.
	CAVRENGHI PROFESSIONALS S.R.L.
	J&P ITALIA S.R.L.
	GFC ASSOCIATI S.R.L.
	STUDIO GLORIOSO S.R.L.
	SECURITAS S.R.L.
	BW CONSULTING S.R.L.
	ATHOS CONSULTING S.R.L.
	SINTESIS - SERVIZI INTEGRATI PER LE IMPRESE S.R.L.
	GEA AMBIENTE S.R.L.
	EPI.FIN. S.R.L.
	RIVALS - SOCIETA' A RESPONSABILITA' LIMITATA
	SYNERGIA S.R.L.
	MC52 S.R.L.
	STUDIO GRAVA S.R.L.
	AREA CONSULTING S.R.L.
	AZIENDA E LAVORO S.R.L.
	MARSIAJ S.R.L.
	COMI & P. S.R.L.
	ADVISA CONSULTING SRL
ASSITECA S.P.A.	AGENZIA GENERALE INA - ASSITALIA MONZA B.B.R. ASSICURAZIONI S.R.L.
	CAMBIASO RISSO MARINE SOCIETA' PER AZIONI
	WILLIS ITALIA S.P.A.
BLUE FINANCIAL COMMUNICATION S.P.A.	PUBLITEC SRL
	CONTRAPPUNTO S.R.L.
	GIVE EMOTIONS SRL
	PENTA GROUP S.R.L.
	PUBLICOMM SRL
	TUTTOPRESS EDITRICE S.R.L.
	GIVI S.R.L.
	1MEDIA S.R.L.
	EDIZIONI TURBO S.R.L.
	PG SERVICE DI MANERA ERICA S.R.L.
	DUESSEGI EDITORE S.R.L.
	DAGOSPIA S.P.A.
	TEKNO SCIENZE S.R.L.
	HEPI PRESS S.R.L.
	SUMO PUBLISHING S.R.L.
	LOZZI PUBLISHING S.R.L.
	EDIZIONI IF S.R.L.

CALEIDO GROUP S.P.A.	GREEN LINE TOUR S.P.A. IN FORMA ABBREVIATA G.L.T. S.P.A. TRAVEL GROUP ALBERGHI S.R.L. AVION TRAVEL (AGENZIA VIAGGI TURISMO) S.R.L. 3A TOURS S.R.L. GUINESS TRAVEL S.R.L. IL SIPARIO MUSICALE ITINERARI DI MUSICA ED ARTE S.R.L. C.A.R.S. COOPERATIVA ASSISTENZA RICREAZIONE SOCIALE - SOCIETA' COOPERATIVA H&A S.R.L. BRERA 21 S.R.L. IC BELLAGIO SRL TARGET MOTIVATION S.R.L. CUSTOMIZED S.R.L. ABACO VIAGGI SRL ALIJET & FARGO INTERNATIONAL S.R.L. TUSCANYALL.COM S.R.L. POSEIDONE - S.R.L. AVVENTURE BELLISSIME S.R.L. GDSM GLOBAL DISTRIBUTION SALES & MARKETING S.R.L.
CDR ADVANCE CAPITAL S.P.A.	EGERIA S.R.L. VIANA S.R.L. HOLTZ S.R.L. G.A.L. VALLE D'ITRIA S.C. A R.L. QUATTRO C S.R.L. FM - SOCIAL INVESTMENT S.R.L. IMPRESA SOCIALE NORDOFFICE SRL VTL E ASSOCIATI- SOCIETA A RESPONSABILITA' LIMITATA CM & PARTNERS S.R.L. BRIXIA S.R.L. SANTO STEFANO SERVIZI SOCIETA' A RESPONSABILITA' LIMITATA ELFREM S.R.L. FRA-MAR S.P.A. S.C. STRATEGY CONSULTANTS S.R.L NIMAR S.R.L. CREDINFORM S.R.L. LARI S.R.L. FIMITA S.R.L. EFIM S.R.L. WORKYNG CONSULTING S.R.L.

CLABO SOCIETA' PER AZIONI	MALVESTIO SOCIETA' PER AZIONI (ABBREVIATA IN MALVESTIO S.P.A.) NOCTIS S.P.A. ARAN WORLD S.R.L. MALETTI S.P.A. ARMONY S.P.A. TECNO SPA ITALIA LIVING S.R.L. GIBAM SHOPS - S.P.A. QUADRIFOGLIO SISTEMI D'ARREDO S.P.A. RIMADESIO S.P.A. ARREDOQUATTRO INDUSTRIE S.P.A. GIORGETTI S.P.A. ALEA S.R.L. CAMELGROUP S.R.L. BROS MANIFATTURE S.R.L. ARPER S.P.A. FLEXFORM - S.P.A. GEVEN S.P.A.
COSTAMP GROUP S.P.A.	DELLAS S.P.A. NTS S.P.A. GAPE DUE S.P.A. MERONI F.LLI S.R.L. ELMANN SRL BIANCHI CASSEFORME - S.R.L. VIRO S.P.A. O.F.A.S.-S.P.A. TRATTER ENGINEERING S.R.L. D'ANDREA SPA MISTA - MINUTERIE E STAMPI - SOCIETA' PER AZIONI SIGLABILE MISTA - S.P.A. I.T.R. INDUSTRIA TRASFORMAZIONE RESINE S.R.L. PINTI-INOX S.P.A. EURO STAMPAGGI S.P.A. FEBAMETAL S.P.A. VETIMEC SOCIETA' COOPERATIVA BOART & WIRE S.R.L. FRATELLI VERGNANO S.R.L. MECAL S.R.L.

COVER 50 S.P.A.	INDUSTRIA CONFEZIONI MONTECATINI IN.CO.M. - S.P.A. MALLONI S.P.A. RO - DEL S.P.A. FACTORY S.R.L. CA' DA MOSTO S.P.A. IL GUFO S.P.A. GI.MEL S.R.L. INDUSTRIAL STARTER -S.P.A. MANIFATTURA CORONA S.R.L. ZAMASPORT SPA MANIFATTURA RIESE S.P.A. CONFEZIONI E FACON S.R.L. CON SIGLA CIEFFE S.R.L. NUMERO 8 S.R.L PELLEMODA S.R.L. KOCCA S.R.L. HERNO S.P.A.
DIGITAL MAGICS S.P.A.	SO.GE.S. IMM. SRL - REAL ESTATE AGROTECNICA S.R.L. EUROPA RISORSE S.R.L. NOMISMA - SOCIETA' DI STUDI ECONOMICI - S.P.A. CONSORZIO NAZIONALE SERVIZI GLOBALI PER LA CIRCOLAZIONE DEI MEZZI DI TRASPORTO IDROTIRRENA COMMERCIALE - S.R.L. DEDALO S.R.L. CONSULMAN S.R.L. I. E O. - INFORMATICA E ORGANIZZAZIONE S.R.L. COEMA S.R.L. GIGLIO GTO MANAGEMENT SRL I.T.C. - ITALIAN TRADE CONSULTANT - S.R.L. CON SIGLA I.T.C. S.R.L. TECNICAM - S.R.L. CLUB MEDICI SERVICE S.R.L. CONVENZIONATO ORDINE DEI MEDICI

DIGITOUCH S.P.A.	GRUPPO FMA SRL TANDEM PUBBLICITA' S.R.L. ASPEN MEDIA ITALIA S.R.L. SISMA ITALIA S.R.L. GRUPPO POZZI S.R.L. SALCOM S.R.L. ADRIATICA PUBBLICITA' S.R.L. D.S. S.R.L. V.G. PUBBLICITA' - S.R.L. EXOMEDIA S.R.L. THE BRAND SHOP - SOCIETA' A RESPONSABILITA' LIMITATA MULTIRADIO S.R.L. YOUNIVERSAL MEDIA S.R.L. NOTAX S.P.A. EDISCOM S.P.A. DOVECONVIENE S.R.L. DOVI 4 S.R.L.
ECOSUNTEK S.P.A.	ODOARDO ZECCA S.R.L. ABENERGIE S.P.A. O A.B. ENERGIE S.P.A. VITALE SUD - SOCIETA' PER AZIONI ENERLUX S.R.L. ALBA POWER SOCIETA' PER AZIONI SIGLABILE ANCHE ALBA POWER S.P.A. BENACO ENERGIA SPA INTERCONSULT S.P.A. MASTROPASQUA INTERNATIONAL - S.P.A. ENERGY SYSTEM S.R.L. + ENERGIA S.P.A. SOCIETA' ELETTRICA IN MORBEGNO SOCIETA' COOPERATIVA PER AZIONI ENOMONDO S.R.L. IDROBLINS S.R.L. SF ENERGY SRL
ENERGICA MOTOR COMPANY S.P.A.	SWM MOTORCYCLES S.R.L. MOTO MORINI S.R.L. FANTIC MOTOR S.P.A. F.LLI ZANONI SRL NEWFREN S.R.L. ESTRIMA S.R.L. FA.CO. FABBRICA CONTENITORI S.R.L. IN SIGLA FA.CO. S.R.L. SEMERFIL S.R.L.

ENERTRONICA SANTERNO S.P.A.	ICES - EBM S.R.L. SEMAR S.R.L. ATEX INDUSTRIES S.R.L. GEMINI TECHNOLOGIES - S.R.L. S.A.P.S. S.R.L. STAMPI ATTREZZATURE PRODOTTI STAMPATI PICIESSE ELETTRONICA S.R.L. SIRIO ELETTRONICA SRL ELECTRONIC SERVICE S.R.L. GECA S.R.L. B810 SOCIETA' A RESPONSABILITA' LIMITATA P.G.A. S.R.L. KENDEIL S.R.L. BICMA S.R.L. PRAIS S.R.L. E.B. TECHNOLOGY S.R.L. LED S.P.A.
EXPERT SYSTEM S.P.A.	EPIPOLI SPA ADITINET CONSULTING SPA AURIGA S.P.A. DGS S.P.A. PLUSERVICE - S.R.L. INTERSISTEMI ITALIA S.P.A. TESI SPA YOUR VOICE S.P.A. ATON S.P.A. TOPNETWORK S.P.A. NEATEC S.P.A. ESRI ITALIA SPA METODA - S.P.A. LYNX S.P.A. SSE - SOFITER SYSTEM ENGINEERING S.P.A. SIGLABILE SSE S.P.A. SEA VISION S.R.L. PIC SERVIZI PER L'INFORMATICA S.R.L.
FINTEL ENERGIA GROUP S.P.A.	DELL'AVENTINO S.R.L. ENERLUX S.R.L. ENERMILL ENERGIE RINNOVABILI S.R.L.

FOPE S.P.A.	LEO PIZZO S.P.A. VALENTI & CO. S.R.L. SAMPA S.P.A. LOTO PREZIOSI S.P.A. GOLD ART S.R.L. LAC S.P.A. LI.VI.OR. S.P.A. INDUSTRIE TESTI S.P.A. CHRYSOS S.P.A. NOMINATION S.R.L. ARETINA METALLI PREZIOSI S.P.A. (IN SIGLA A.M.P. S.P.A.) PICCHIOTTI - S.R.L. MATTIOLI S.P.A. RASELLI FRANCO S.P.A. GIMET BRASS S.R.L.
GIORGIO FEDON & FIGLI SPA	GRITTI GROUP S.P.A. AMEDEO NAPPI INDUSTRIA CERARIA S.P.A. SVAD DONDI S.P.A. PONZINI -S.P.A. BOTTONIFICIO PADANO SOCIETA' PER AZIONI RACCAGNI GROUP S.R.L. CROCI S.P.A. SORINI E MIGLIAVACCA SPA CAMP S.P.A. COSTRUZIONE ARTICOLI MONTAGNA - PREMANA FERRARI S.P.A. BOTTONIFICIO B.A.P. S.P.A.
GO INTERNET S.P.A	BT-MONITORING S.R.L. MOBILE SOLUTION S.R.L. TELEREADING S.R.L. SPECIAL SERVICE S.R.L. - IN LIQUIDAZIONE R. PIERRE DIGITAL S.P.A. EUROTEL S.R.L. SINTEL SRL LEADER CONSULTING, MARKETING, COMMUNICATION - S.R.L. IN LIQUIDA ZIONE SAITEL S.R.L. SERVICOM S.R.L. MESSAGENET S.P.A. MONTE MASSA MARTANO - SOCIETA' A RESPONSABILITA' LIMITATA

GRUPPO GREEN POWER S.P.A.	UPSOLAR SYSTEM ITALIA S.R.L. VERMEER ITALIA S.R.L. COMESTERO SISTEMI S.P.A. FORNITURE ARTICOLI ELETTRO TECNICI S.R.L. IN FORMA ABBREVIATA FAET - S.R.L. DALLA VECCHIA FABRIZIO & C. S.R.L. TEST S.R.L. I.M.A. - S.R.L. SPINA GROUP S.R.L. CABLE SERVICE S.R.L. C.I.D.A.T. - S.P.A. - CENTRO INTERNAZIONALE DISTRIBUZIONE ARTICOL I TECNICI IN BREVE CIDAT S.P.A. INTERNATIONAL POWER COMPONENTS S.R.L. RISP S.R.L. SEIPEE S.P.A. RANIERI TONISSI S.P.A. ELETTROTEK KABEL S.P.A. FERWOOD S.R.L. COENERGIA S.R.L. NUOVA RICAMBI SRL SORMA SPA I.R. ITALIANA RIPROGRAFIA S.R.L.
H-FARM S.P.A.	TBS IT TELEMATIC & BIOMEDICAL SERVICES S.R.L. SEDIIN - S.P.A. SSE - SOFITER SYSTEM ENGINEERING S.P.A. SIGLABILE SSE S.P.A. NOVANEXT SOCIETA' A RESPONSABILITA' LIMITATA INTERSERVICE S.R.L. METISOFT S.P.A. IFM INFOMASTER S.P.A. MARIFIN S.R.L. UNITEAM S.R.L. CODIN - SOCIETA' PER AZIONI ADVANCED GLOBAL SOLUTION A.G.S. S.P.A. PRESENT S.P.A. SIRFIN SOCIETA' PER L'INFORMATICA SPA. CON SIGLA SIRFIN SPA. ESSEMATICA - S.P.A. AENNE PRESS SPA

IMVEST S.P.A.	IMMOBILIARE GAMMA S.R.L. COMMERCIALE SIRI S.R.L. FOSFITALIA IMMOBILIARE S.P.A. TURNO S.R.L. G.I.PA. - GESTIONI INVESTIMENTI PARTECIPAZIONI - S.P.A. ILMA S.R.L. IMMOBILIARE COBRA S.R.L. DIGIO S.R.L. VENINA 90 S.P.A. MONTECASTELLO S.P.A. IMMOBILIARE RHO MILANO S.R.L. IMMOBILIARE ROMA S.R.L. BENINVEST S.R.L. IMMOBILIARE FRANCI SRL TECHNOSPARE IMMOBILIARE S.R.L. IMMOBILIARE DIANA SOCIETA' A RESPONSABILITA' LIMITATA IMMOBILIARE ARDELIA S.R.L. MONTFIN S.R.L. IMMOBILIARE GIDUE SRL RELBERG S.R.L.
INIZIATIVE BRESCIANE - INBRE - S.P.A.	ECOFIM - COMPAGNIA FINANZA E MATTONE S.R.L. EDIF HOLDING S.P.A. CO.STAMP - SRL BOFFI S.P.A. VICTORIA HD SRL SUGARMUSIC S.P.A. GHIAL HOLDING S.P.A. PALAZZO FERONI FINANZIARIA S.P.A.
LEONE FILM GROUP S.P.A.	ARTIS EDIZIONI DIGITALI S.R.L. MINERVA PICTURES GROUP S.R.L. RED FILM - SOCIETA' A RESPONSABILITA' LIMITATA BIBI' FILM TV S.R.L. CASANOVA MULTIMEDIA S.P.A. MOVIE PLANET S.R.L. ARCADIA S.R.L. M2 PICTURES S.R.L. VIDEA S.P.A. FASO FILM - SOCIETA A RESPONSABILITA LIMITATA COGES SPA TARGET COMMUNICATIONS SRL INDIGO FILM SRL LEVANTE - S.R.L.

MASI AGRICOLA S.P.A.	SUN LAND S.P.A. CANTINE BRUSA - SOCIETA' PER AZIONI CANTINE RIUNITE & CIV - SOCIETA' COOPERATIVA AGRICOLA FERRARELLE - S.P.A. TERRE CEVICO - GRUPPO CENTRO VINICOLO COOPERATIVO ROMAGNOLO SOCIETA' COOPERATIVA AGRICOLA BIRRA CASTELLO S.P.A. CASA VINICOLA ZONIN S.P.A. BIRRA FORST S.P.A. FRATELLI MARTINI SECONDO LUIGI S.P.A. CASA VINICOLA BOTTER CARLO & C. SPA ACQUA MINERALE SAN BENEDETTO S.P.A.
MAILUP S.P.A.	T COMMUNICATION S.R.L. ASCOM SERVIZI MODENA SOCIETA' COOPERATIVA DOMINO S.R.L TEC S.R.L. QUALITA' E ATTESTAZIONI AZIENDALI S.R.L. SAFO GROUP S.P.A. G.M. SYSTEM 2000 S.R.L. SERVIZIO INFORMATICA S.R.L. S.C. STUDIO ASSOCIATO S.R.L. PROGRESS GROUP S.R.L. SEFIN S.P.A. ALMA S.P.A. ARCHIVA S.R.L. TDL GLOBAL OUTSOURCING SRL TC & C S.R.L. MICRODISEGNO S.R.L. EDISERVICE S.R.L. EDILPORTALE.COM - S.P.A. ATHENAEUM S.P.A. SMARTEST - S.R.L.

NOTORIOUS PICTURES SOCIETA' PER AZIONI	EUROPRODUZIONE S.R.L. FOTOCINEMA S.R.L. LEVANTE - S.R.L. SACHER FILM S.R.L. CINEMA S.R.L. ARCHIMEDE SRL VIDEOPROJECT S.R.L. NEP BROADCAST SERVICES ITALY S.R.L. VIDEO 7 S.R.L. RADA FILM - SOCIETA' A RESPONSABILITA' LIMITATA CINE VIDEO DOPPIATORI C.V.D. SOCIETA' COOPERATIVA A RESPONSABILITA' LIMITATA V.S.S.VIDEO SOUND SERVICE SRL BIBI' FILM TV S.R.L. VIDEO PROGETTI S.R.L. MORMORA MUSIC S.R.L. I.B.C. MOVIE S.R.L. RED FILM - SOCIETA' A RESPONSABILITA' LIMITATA PACO CINEMATOGRAFICA - S.R.L. ZEROSTUDIO'S SOCIETA' A RESPONSABILITA' LIMITATA S.D.L. 2005 S.R.L.
PRISMI S.P.A.	UNITEAM S.R.L. STUDIO INFORMATICA S.R.L. PLANETEK ITALIA S.R.L. EPIPOLI SPA ATS ADVANCED TECHNOLOGY SOLUTIONS S.P.A. METISOFT S.P.A. METODA - S.P.A. SEDIIN - S.P.A. CONSOFT SISTEMI SOCIETA' PER AZIONI IN FORMA ABBREVIATA CONSOFT SISTEMI S.P.A. SIRFIN SOCIETA' PER L'INFORMATICA SPA. CON SIGLA SIRFIN SPA. SSE - SOFITER SYSTEM ENGINEERING S.P.A. SIGLABILE SSE S.P.A. PIC SERVIZI PER L'INFORMATICA S.R.L. READYTEC SOCIETA' PER AZIONI IN BREVE READYTEC S.P.A. LINKS - MANAGEMENT AND TECHNOLOGY - S.P.A. IN SIGLA LINKS S.P. A. C.R.M. S.R.L.
ROSETTI MARINO S.P.A.	MANITALIDEA SPA PROJECT AUTOMATION S.P.A. ITALFERR S.P.A. RENCO S.P.A.

SITI - B&T GROUP S.P.A.	JOBS AUTOMAZIONE S.P.A. IN VIA ABBREVIATA ANCHE DENOMINATA JOBS S.P.A. CASAGRANDE S.P.A. COMERIO ERCOLE S.P.A. SAMPIERANA S.P.A. ELETTRIC 80 S.P.A. VERTIV S.R.L. DELLA TOFFOLA S.P.A. B.M.B. S.P.A. OCRIM - SOCIETA' PER L'INDUSTRIA MECCANICA S.P.A. INGLASS S.P.A. MARSILLI S.P.A. TOSCOTEC S.P.A. LONATI S.P.A. ITEMA S.P.A. GRUPPO CIMBALI S.P.A. SPEA S.P.A.
SOFTEC S.P.A.	TEST POINT S.R.L. AVANGARDE CONSULTING S.R.L. LOGOS TECHNOLOGY S.R.L. STEP - S.R.L. ONE TEAM S.R.L. SYNC LAB S.R.L. XEFFE - S.R.L. TRUST-ITALIA S.P.A. IDC S.P.A. DATA NETWORK CONSULTING S.R.L.
VETRYA S.P.A	ATON S.P.A. SOLID WORLD SRL EPIPOLI SPA INTERSISTEMI ITALIA S.P.A. ADITINET CONSULTING SPA PRESENT S.P.A. ESRI ITALIA SPA TESI SPA TOPNETWORK S.P.A. OBJECTWAY S.P.A. LYNX S.P.A. PAR-TEC S.P.A. SBI S.R.L. SME UP S.P.A. DGS S.P.A. METODA - S.P.A. SPINDOX S.P.A. AURIGA S.P.A. SEA VISION S.R.L. PIC SERVIZI PER L'INFORMATICA S.R.L.

VISIBILIA EDITORE S.P.A.	EDIZIONI FAG S.R.L. MATTIOLI 1885 S.R.L. TEP S.R.L. EDIZIONI STAR COMICS S.R.L. MACRO SOCIETA' COOPERATIVA IN FORMA ABBREVIATA MACRO SOC. COOP. CELDES - S.R.L. MEDIA S.R.L. SCRIPTA MANEANT S.R.L. EGAF EDIZIONI - S.R.L. ASTE GIUDIZIARIE INLINEA S.P.A. LE SCIENZE S.P.A. TNE S.R.L. EDIZIONI EL S.R.L.
WM CAPITAL S.P.A.	BUSINESS COMPETENCE S.R.L. FOCUS MANAGEMENT S.P.A. MG CONSULTING S.R.L RONCUCCI&PARTNERS S.R.L. COMPAGNIA DELLE IDEE SRL SERVIZI & SISTEMI S.R.L. ECONOMISTI ASSOCIATI S.R.L. INIZIATIVA CUBE S.R.L. PROGESA S.P.A. ARGO S.R.L. MACFIN - MANAGEMENT CONSULTANTS - SOCIETA A RESPONSABILITA LIMITATA WMR S.R.L. GRUPPO IMPERIALI - NETWORK SERVICES S.R.L. EUROSEARCH CONSULTANTS - S.R.L. SO.GE.I. S.R.L. KLECHA & CO. S.R.L. R.F. PORTA S.R.L. WOLLO S.R.L. EXCELLENCE SRL TENOR S.R.L.

Table 3.5: Ateco 2007 industry code – Legend

ATECO 2007	General sector	Specific sector	Activity	AIM company	Sector	
110210	ATTIVITÀ MANIFATTURIERE	INDUSTRIA DELLE BEVANDE	Produzione di vini da tavola e v.p.q.r.d.	MASI AGRICOLA S.P.A.	Manufacturing	Secondary
141000		CONFEZIONE DI ARTICOLI DI ABBIGLIAMENTO; CONFEZIONE DI ARTICOLI IN PELLE E PELLICCIA	Confezione di articoli di abbigliamento (escluso abbigliamento in pelliccia)	COVER 50 S.P.A.		
257320		FABBRICAZIONE DI PRODOTTI IN METALLO (ESCLUSI MACCHINARI E ATTREZZATURE)	Fabbricazione di stampi, portastampi, sagome, forme per macchine	COSTAMP GROUP S.P.A.		
261100		FABBRICAZIONE DI COMPUTER E PRODOTTI DI ELETTRONICA E OTTICA; APPARECCHI ELETTROMEDICALI, APPARECCHI DI MISURAZIONE E DI OROLOGI	Fabbricazione di componenti elettronici	ENERTRONICA SANTERNO S.P.A.		
289999		FABBRICAZIONE DI MACCHINARI ED APPARECCHIATURE NCA	Fabbricazione di altre macchine per impieghi speciali nca (incluse parti e accessori)	SITI - B&T GROUP S.P.A.		
309112		FABBRICAZIONE DI ALTRI MEZZI DI TRASPORTO	Fabbricazione di motocicli	ENERGICA MOTOR COMPANY S.P.A.		
310122		FABBRICAZIONE DI MOBILI	Fabbricazione di altri mobili non metallici per ufficio e negozi	CLABO SOCIETA' PER AZIONI		
321210		ALTRE INDUSTRIE MANIFATTURIERE	Fabbricazione di oggetti di gioielleria ed oreficeria in metalli preziosi o rivestiti di metalli preziosi	FOPE S.P.A.		
329990		ALTRE INDUSTRIE MANIFATTURIERE	Fabbricazione di altri articoli nca	GIORGIO FEDON & FIGLI SPA		
351100	FORNITURA DI ENERGIA ELETTRICA, GAS, VAPORE E ARIA CONDIZIONATA	FORNITURA DI ENERGIA ELETTRICA, GAS, VAPORE E ARIA CONDIZIONATA	Produzione di energia elettrica	ECOSUNTEK S.P.A.	Utilities	Secondary
351400		FORNITURA DI ENERGIA ELETTRICA, GAS, VAPORE E ARIA CONDIZIONATA	Commercio di energia elettrica	FINTEL ENERGIA GROUP S.P.A.		
466920	COMMERCIO ALL'INGROSSO E AL DETTAGLIO; RIPARAZIONE DI AUTOVEICOLI E MOTOCICLI	COMMERCIO ALL'INGROSSO (ESCLUSO QUELLO DI AUTOVEICOLI E DI MOTOCICLI)	Commercio all'ingrosso di materiale elettrico per impianti di uso industriale	GRUPPO GREEN POWER S.P.A.	Utilities	Secondary
581400	SERVIZI DI INFORMAZIONE E COMUNICAZIONE	ATTIVITÀ EDITORIALI	Edizione di riviste e periodici	BLUE FINANCIAL COMMUNICATION S.P.	Communication	Tertiary
581400		ATTIVITÀ EDITORIALI	Edizione di riviste e periodici	VISIBILIA EDITORE S.P.A.		
591100		ATTIVITÀ DI PRODUZIONE CINEMATOGRAFICA, DI VIDEO E DI PROGRAMMI TELEVISIVI, DI REGISTRAZIONI MUSICALI E SONORE	Attività di produzione cinematografica, di video e di programmi televisivi	LEONE FILM GROUP S.P.A.		
591100		ATTIVITÀ DI PRODUZIONE CINEMATOGRAFICA, DI VIDEO E DI PROGRAMMI TELEVISIVI, DI REGISTRAZIONI MUSICALI E SONORE	Attività di produzione cinematografica, di video e di programmi televisivi	NOTORIOUS PICTURES SOCIETA' PER AZ		
619099		TELECOMUNICAZIONI	Altre attività connesse alle telecomunicazioni nca	GO INTERNET S.P.A		
620100		PRODUZIONE DI SOFTWARE, CONSULENZA INFORMATICA E ATTIVITÀ CONNESSE	Produzione di software non connesso all'edizione	PRISMI S.P.A.		
620100		PRODUZIONE DI SOFTWARE, CONSULENZA INFORMATICA E ATTIVITÀ CONNESSE	Produzione di software non connesso all'edizione	EXPERT SYSTEM S.P.A.		
620100		PRODUZIONE DI SOFTWARE, CONSULENZA INFORMATICA E ATTIVITÀ CONNESSE	Produzione di software non connesso all'edizione	VETRYA S.P.A		
620200		PRODUZIONE DI SOFTWARE, CONSULENZA INFORMATICA E ATTIVITÀ CONNESSE	Consulenza nel settore delle tecnologie dell'informatica	H-FARM S.P.A.		
620200		PRODUZIONE DI SOFTWARE, CONSULENZA INFORMATICA E ATTIVITÀ CONNESSE	Consulenza nel settore delle tecnologie dell'informatica	SOFTEC S.P.A.		
631130		ATTIVITÀ DEI SERVIZI D'INFORMAZIONE E ALTRI SERVIZI INFORMATICI	Hosting e fornitura di servizi applicativi (ASP)	MAILUP S.P.A.		
662200	ATTIVITÀ FINANZIARIE E ASSICURATIVE	ATTIVITÀ AUSILIARIE DEI SERVIZI FINANZIARI E DELLE ATTIVITÀ ASSICURATIVE	Attività di agenti e mediatori di assicurazioni	ASSITECA S.P.A.	Financial services	Tertiary
681000	ATTIVITÀ IMMOBILIARI	ATTIVITÀ IMMOBILIARI	Compravendita di beni immobili effettuata su beni propri	IMVEST S.P.A.	Real estate	Tertiary
701000	ATTIVITÀ PROFESSIONALI, SCIENTIFICHE E TECNICHE	ATTIVITÀ DI DIREZIONE AZIENDALE E DI CONSULENZA GESTIONALE	Attività delle holding impegnate nelle attività gestionali (holding operative)	INIZIATIVE BRESCIANE - INBRE - S.P.A.	Professional/scientific/technical services	Tertiary
702209		ATTIVITÀ DI DIREZIONE AZIENDALE E DI CONSULENZA GESTIONALE	Altre attività di consulenza imprenditoriale e altra consulenza amministrativo-gestionale e pianificazione aziendale	DIGITAL MAGICS S.P.A.		
702209		ATTIVITÀ DI DIREZIONE AZIENDALE E DI CONSULENZA GESTIONALE	Altre attività di consulenza imprenditoriale e altra consulenza amministrativo-gestionale e pianificazione aziendale	WM CAPITAL S.P.A.		
702209		ATTIVITÀ DI DIREZIONE AZIENDALE E DI CONSULENZA GESTIONALE	Altre attività di consulenza imprenditoriale e altra consulenza amministrativo-gestionale e pianificazione aziendale	AMBROMOBILIARE S.P.A.		
702209		ATTIVITÀ DI DIREZIONE AZIENDALE E DI CONSULENZA GESTIONALE	Altre attività di consulenza imprenditoriale e altra consulenza amministrativo-gestionale e pianificazione aziendale	CDR ADVANCE CAPITAL S.P.A.		
711220		ATTIVITÀ DEGLI STUDI DI ARCHITETTURA, INGEGNERIA ED ALTRI STUDI TECNICI	Servizi di progettazione di ingegneria integrata	ROSETTI MARINO S.P.A.		
731102		PUBBLICITÀ E RICERCHE DI MERCATO	Conduzione di campagne di marketing e altri servizi pubblicitari	DIGITOUCH S.P.A.		
791100	NOLEGGIO, AGENZIE DI VIAGGIO, SERVIZI DI SUPPORTO ALLE IMPRESE	ATTIVITÀ DEI SERVIZI DELLE AGENZIE DI VIAGGIO, DEI TOUR OPERATOR E SERVIZI DI PRENOTAZIONE E ATTIVITÀ CONNESSE	Attività delle agenzie di viaggio	CALEIDO GROUP S.P.A.	Other services	Tertiary

Figure 3.4a: Revenues (pre)

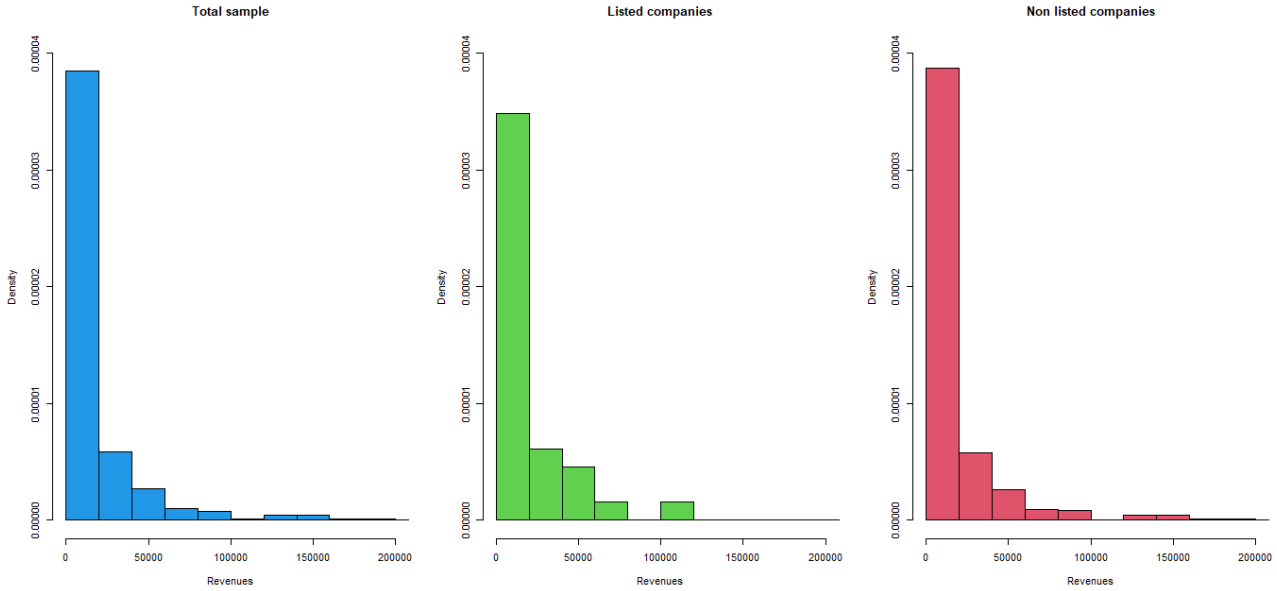


Figure 3.5a: Assets (pre)

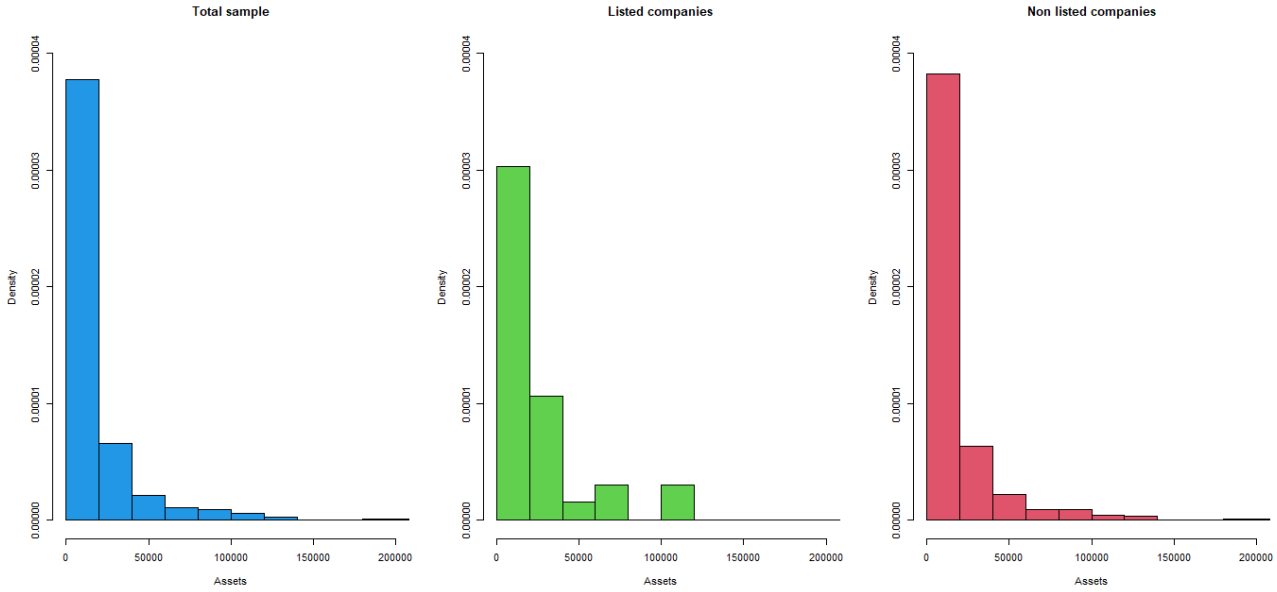


Figure 3.9a: Summary statistics – Listed subsample

Revenues_t	Revenues_t+1	Revenues_t+2	Revenues_t+3	SalesGrowth%_t+1	SalesGrowth%_t+2	SalesGrowth%_t+3	Profit/loss_t	Profit/loss_t+1
Min. : 4	Min. : 247	Min. : 8	Min. : 100	Min. : -57.695	Min. :-96.761	Min. : -81.140	Min. :-4229	Min. :-6412.0
1st Qu.: 3237	1st Qu.: 3749	1st Qu.: 4890	1st Qu.: 5578	1st Qu.: -3.458	1st Qu.: -4.310	1st Qu.: -12.068	1st Qu.: -50	1st Qu.: -720.0
Median : 9768	Median : 10507	Median : 15151	Median : 14490	Median : 6.546	Median : 9.259	Median : 1.507	Median : 169	Median : 112.0
Mean : 30829	Mean : 24716	Mean : 27013	Mean : 23759	Mean : 197.988	Mean : 42.666	Mean : 39.317	Mean : 1564	Mean : 882.7
3rd Qu.: 24688	3rd Qu.: 28026	3rd Qu.: 31259	3rd Qu.: 29705	3rd Qu.: 36.266	3rd Qu.: 30.000	3rd Qu.: 25.363	3rd Qu.: 1916	3rd Qu.: 2181.0
Max. :406776	Max. :172085	Max. :200878	Max. :117249	Max. :6075.000	Max. :777.941	Max. :1150.000	Max. :32725	Max. :21368.0

Profit/loss_t+2	Profit/loss_t+3	Assets_t	Assets_t+1	Assets_t+2	Assets_t+3	AssetsGrowth%_t+1	AssetsGrowth%_t+2	AssetsGrowth%_t+3
Min. :-7272.0	Min. :-7699.0	Min. : 2298	Min. : 2424	Min. : 2680	Min. : 2182	Min. :-22.464	Min. :-28.325	Min. :-19.382
1st Qu.: -955.0	1st Qu.:-2270.8	1st Qu.: 9549	1st Qu.: 14038	1st Qu.: 16930	1st Qu.: 18142	1st Qu.: -4.861	1st Qu.: -1.149	1st Qu.: -3.904
Median : 73.0	Median : -62.0	Median : 27562	Median : 26894	Median : 31045	Median : 32242	Median : 6.521	Median : 10.739	Median : 2.046
Mean : 435.7	Mean : -235.3	Mean : 41191	Mean : 44108	Mean : 50994	Mean : 52993	Mean : 11.550	Mean : 15.029	Mean : 3.375
3rd Qu.: 1225.0	3rd Qu.: 1588.5	3rd Qu.: 49173	3rd Qu.: 47677	3rd Qu.: 62279	3rd Qu.: 65350	3rd Qu.: 16.896	3rd Qu.: 30.096	3rd Qu.: 10.778
Max. : 9742.0	Max. : 9898.0	Max. :275823	Max. :311635	Max. :381917	Max. :336617	Max. : 80.130	Max. : 93.847	Max. : 27.708

Capital_intensity_average	Asset_turnover_average	Equity_t	Equity_t+1	Equity_t+2	Equity_t+3
Min. : 0.6051	Min. :0.007546	Min. : 1366	Min. : 1481	Min. : 1178	Min. : 950
1st Qu.: 1.2783	1st Qu.:0.330458	1st Qu.: 3518	1st Qu.: 4387	1st Qu.: 4296	1st Qu.: 3890
Median : 2.0966	Median :0.519025	Median : 9282	Median : 11511	Median : 12946	Median : 12582
Mean : 43.3469	Mean :0.601915	Mean : 18793	Mean : 20541	Mean : 21543	Mean : 22539
3rd Qu.: 3.4217	3rd Qu.:0.842100	3rd Qu.: 16149	3rd Qu.: 22824	3rd Qu.: 23589	3rd Qu.: 25407
Max. :1261.1777	Max. :1.684194	Max. :128192	Max. :142910	Max. :148852	Max. :156280

NFP/Ebitda_t	NFP/Ebitda_t+1	NFP/Ebitda_t+2	NFP/Ebitda_t+3	NFP_t	NFP_t+1	NFP_t+2
Min. :-65.2700	Min. :-114.1394	Min. :-9.8870	Min. :-7.3847	Min. :-21210	Min. :-33564.7	Min. :-38857.67
1st Qu.: -2.9807	1st Qu.: -0.9358	1st Qu.:-0.7407	1st Qu.:-1.2294	1st Qu.: -2948	1st Qu.: -284.7	1st Qu.: -59.58
Median : -0.2072	Median : 0.8744	Median : 0.2655	Median : 0.4749	Median : 1026	Median : 1700.2	Median : 869.95
Mean : -1.2458	Mean : -2.3336	Mean : 1.0322	Mean : 1.1029	Mean : 1607	Mean : 2583.1	Mean : 3416.45
3rd Qu.: 2.1204	3rd Qu.: 2.3351	3rd Qu.: 3.6890	3rd Qu.: 2.7764	3rd Qu.: 5946	3rd Qu.: 5665.0	3rd Qu.: 6873.03
Max. : 35.5240	Max. : 14.2871	Max. :22.5700	Max. :11.8441	Max. : 25855	Max. : 23963.5	Max. : 27215.00

NFP_t+3	EBITDA/Sales%_t	EBITDA/Sales%_t+1	EBITDA/Sales%_t+2	EBITDA/Sales%_t+3	ROA%_t	ROA%_t+1	ROA%_t+2	ROA%_t+3
Min. :-40069.2	Min. :-178.790	Min. :-285.890	Min. :-166.190	Min. :-277.530	Min. :-46.480	Min. :-39.750	Min. :-60.13	Min. :-57.360
1st Qu.: 140.3	1st Qu.: 2.185	1st Qu.: 1.330	1st Qu.: -2.110	1st Qu.: -8.025	1st Qu.: -2.030	1st Qu.: -2.780	1st Qu.: -4.45	1st Qu.: -7.688
Median : 1947.3	Median : 9.570	Median : 7.910	Median : 5.660	Median : 6.590	Median : 3.800	Median : 1.310	Median : -0.26	Median : -0.825
Mean : 4398.0	Mean : 1.617	Mean : -7.674	Mean : -3.551	Mean : -5.516	Mean : 1.688	Mean : 0.283	Mean : -2.24	Mean : -4.643
3rd Qu.: 7037.3	3rd Qu.: 14.818	3rd Qu.: 13.380	3rd Qu.: 12.100	3rd Qu.: 14.248	3rd Qu.: 6.450	3rd Qu.: 4.760	3rd Qu.: 3.34	3rd Qu.: 2.155
Max. : 32211.0	Max. : 72.830	Max. : 62.000	Max. : 53.790	Max. : 58.960	Max. : 20.890	Max. : 18.330	Max. : 15.85	Max. : 16.360

ROE%_t	ROE%_t+1	ROE%_t+2	ROE%_t+3	D/E%_t	D/E%_t+1	D/E%_t+2	D/E%_t+3	Debt/EBITDA%_t
Min. :-81.3400	Min. :-118.030	Min. :-52.630	Min. :-91.29	Min. :0.0000	Min. :0.0000	Min. :0.0000	Min. :0.0000	Min. :-250.340
1st Qu.: -0.8000	1st Qu.: -7.160	1st Qu.: -7.790	1st Qu.:-14.12	1st Qu.:0.0500	1st Qu.:0.1100	1st Qu.:0.2000	1st Qu.:0.2375	1st Qu.: 0.000
Median : 5.2400	Median : 1.610	Median : 2.175	Median : 0.92	Median :0.3900	Median :0.3500	Median :0.4300	Median :0.4100	Median : 0.540
Mean : -0.3454	Mean : -4.475	Mean : -3.557	Mean : -6.27	Mean :0.5997	Mean :0.5939	Mean :0.5812	Mean :0.6706	Mean : -8.898
3rd Qu.: 10.0100	3rd Qu.: 7.940	3rd Qu.: 6.518	3rd Qu.: 5.71	3rd Qu.:0.7100	3rd Qu.:0.6500	3rd Qu.:0.7200	3rd Qu.:1.1400	3rd Qu.: 2.440
Max. : 26.9700	Max. : 24.530	Max. : 21.710	Max. : 41.07	Max. :3.4800	Max. :3.6000	Max. :2.6600	Max. :2.5700	Max. : 6.110

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Debt/EBITDA%_t+1   Debt/EBITDA%_t+2  Debt/EBITDA%_t+3  Intangibles_t    Intangibles_t+1 Intangibles_t+2 Intangibles_t+3   R&Dexpenses_t    R&Dexpenses_t+1
Min.   :-122.730   Min.   :-22.720   Min.   :-4.5100   Min.   :  283   Min.   :  301   Min.   :  179   Min.   :   64.0   Min.   :   0.0   Min.   :   0.0
1st Qu.:   0.000   1st Qu.: -0.370   1st Qu.:-0.9875   1st Qu.:  933   1st Qu.:  814   1st Qu.:  735   1st Qu.:  905.2   1st Qu.:   0.0   1st Qu.:   0.0
Median :   1.150   Median :  1.150   Median : 1.4300   Median : 1813   Median : 2316   Median : 2132   Median : 1883.5   Median :   0.0   Median :   4.5
Mean   :  -1.078   Mean   :  1.791   Mean   : 1.7016   Mean   : 5085   Mean   : 5391   Mean   : 6442   Mean   : 6871.9   Mean   : 544.9   Mean   : 778.7
3rd Qu.:   3.680   3rd Qu.:  4.710   3rd Qu.: 3.6775   3rd Qu.: 5084   3rd Qu.: 5329   3rd Qu.: 6251   3rd Qu.: 6078.8   3rd Qu.: 188.0   3rd Qu.: 304.5
Max.   :  31.190   Max.   : 24.080   Max.   :14.0400   Max.   :29777   Max.   :31595   Max.   :35671   Max.   :44074.0   Max.   :4059.0   Max.   :6832.0

R&Dexpenses_t+2  R&Dexpenses_t+3   PPE/Assets_t       PPE/Assets_t+1      PPE/Assets_t+2      PPE/Assets_t+3      CurrentAssets/Assets_t CurrentAssets/Assets_t+1
Min.   :   0.0   Min.   :   0.0   Min.   :0.0000000   Min.   :0.0000000   Min.   :0.0000000   Min.   :0.0000000   Min.   :0.1182         Min.   :0.1137
1st Qu.:   0.0   1st Qu.:   0.0   1st Qu.:0.0002846   1st Qu.:0.0002312   1st Qu.:0.0001926   1st Qu.:0.0000936   1st Qu.:0.4306         1st Qu.:0.3751
Median :   0.0   Median :   0.0   Median :0.0057194   Median :0.0061936   Median :0.0049973   Median :0.0057001   Median :0.6287         Median :0.5316
Mean   : 648.2   Mean   : 788.1   Mean   :0.0584537   Mean   :0.0552977   Mean   :0.0550952   Mean   :0.0595217   Mean   :0.6098         Mean   :0.5345
3rd Qu.: 478.2   3rd Qu.: 666.0   3rd Qu.:0.1018946   3rd Qu.:0.0583802   3rd Qu.:0.0711068   3rd Qu.:0.0932394   3rd Qu.:0.7938         3rd Qu.:0.7078
Max.   :5777.0   Max.   :6151.0   Max.   :0.2742042   Max.   :0.3324254   Max.   :0.3000523   Max.   :0.3179157   Max.   :0.9183         Max.   :0.9111

CurrentAssets/Assets_t+2 CurrentAssets/Assets_t+3 Operating_expenses_t Operating_expenses_t+1 Operating_expenses_t+2 Operating_expenses_t+3
Min.   :0.1134           Min.   :0.07234          Min.   :   420       Min.   :   917         Min.   :   775         Min.   :   782
1st Qu.:0.4375           1st Qu.:0.38597          1st Qu.:  4374       1st Qu.:  6188         1st Qu.:  6599         1st Qu.:  8517
Median :0.5156           Median :0.50212          Median :  9999       Median : 11716         Median : 16686         Median : 15586
Mean   :0.5393           Mean   :0.51802          Mean   : 24945       Mean   : 26092         Mean   : 29502         Mean   : 32527
3rd Qu.:0.7193           3rd Qu.:0.67937          3rd Qu.: 21977       3rd Qu.: 27118         3rd Qu.: 29246         3rd Qu.: 32259
Max.   :0.9212           Max.   :0.93777          Max.   :207355       Max.   :198580         Max.   :262506         Max.   :341425

Coverage_average   Current ratio_t Current ratio_t+1 Current ratio_t+2 Current ratio_t+3 STLiab./Tot.Liab%_t STLiab./Tot.Liab%_t+1 STLiab./Tot.Liab%_t+2
Min.   : -64.4432  Min.   :0.420   Min.   :0.520     Min.   :0.510     Min.   :0.2400    Min.   :0.4100     Min.   :0.3600         Min.   :0.0600
1st Qu.:  -0.0412  1st Qu.:1.120   1st Qu.:1.050     1st Qu.:0.980     1st Qu.:0.9525    1st Qu.:0.7000     1st Qu.:0.6700         1st Qu.:0.5800
Median :   5.1756  Median :1.550   Median :1.700     Median :1.360     Median :1.4000    Median :0.8800     Median :0.7800         Median :0.7500
Mean   : 103.1858  Mean   :2.107   Mean   :1.892     Mean   :2.113     Mean   :1.8903    Mean   :0.8321     Mean   :0.7682         Mean   :0.7161
3rd Qu.:  24.1559  3rd Qu.:2.300   3rd Qu.:2.510     3rd Qu.:2.510     3rd Qu.:2.1925    3rd Qu.:1.0000     3rd Qu.:0.9300         3rd Qu.:0.9200
Max.   :2619.3667  Max.   :7.600   Max.   :4.480     Max.   :8.720     Max.   :9.0500    Max.   :1.0000     Max.   :1.0000         Max.   :1.0000

STLiab./Tot.Liab%_t+3     ROI%_t            ROI%_t+1          ROI%_t+2          ROI%_t+3          NWC_t           NWC_t+1          NWC_t+2          NWC_t+3
Min.   :0.1200        Min.   :-23.490   Min.   :-19.040   Min.   :-26.490   Min.   :-29.57   Min.   :-9126   Min.   :-7141   Min.   :-8017   Min.   :-15428
1st Qu.:0.5675        1st Qu.: -1.990   1st Qu.: -3.425   1st Qu.: -8.307   1st Qu.: -6.00   1st Qu.:  836   1st Qu.:  528   1st Qu.: -351   1st Qu.:  -595
Median :0.7500        Median :  6.770   Median :  2.400   Median : -0.335   Median :  1.10   Median : 2343   Median : 2833   Median : 2851   Median :  2348
Mean   :0.7134        Mean   :  4.877   Mean   :  1.976   Mean   : -1.594   Mean   : -0.38   Mean   : 8696   Mean   : 8162   Mean   : 9781   Mean   :  8872
3rd Qu.:0.8725        3rd Qu.: 10.075   3rd Qu.:  7.465   3rd Qu.:  5.055   3rd Qu.:  4.04   3rd Qu.: 8608   3rd Qu.: 9435   3rd Qu.:13485   3rd Qu.: 12520
Max.   :1.0000        Max.   : 27.340   Max.   : 24.270   Max.   : 21.560   Max.   : 21.24   Max.   :60648   Max.   :60800   Max.   :66340   Max.   : 70541
```

Figure 3.9b: Summary statistics – Non-listed subsample

Revenues_t	Revenues_t+1	Revenues_t+2	Revenues_t+3	SalesGrowth%_t+1	SalesGrowth%_t+2	SalesGrowth%_t+3	Profit/loss_t	Profit/loss_t+1
Min. : 0	Min. : 0	Min. : 19	Min. : 0	Min. :-89.461	Min. :-95.817	Min. :-100.000	Min. :-25243.0	Min. :-3725.0
1st Qu.: 2107	1st Qu.: 2190	1st Qu.: 2181	1st Qu.: 1934	1st Qu.: -4.840	1st Qu.: -6.739	1st Qu.: -5.912	1st Qu.: 11.0	1st Qu.: 14.0
Median : 6975	Median : 7178	Median : 7688	Median : 7202	Median : 5.175	Median : 3.722	Median : 3.414	Median : 114.0	Median : 125.5
Mean : 19217	Mean : 20189	Mean : 21382	Mean : 19198	Mean : 8.045	Mean : 7.441	Mean : 6.159	Mean : 922.4	Mean : 1125.2
3rd Qu.: 19257	3rd Qu.: 20786	3rd Qu.: 22641	3rd Qu.: 21514	3rd Qu.: 15.456	3rd Qu.: 14.186	3rd Qu.: 13.258	3rd Qu.: 495.0	3rd Qu.: 736.8
Max. :612464	Max. :592377	Max. :627330	Max. :627615	Max. :355.454	Max. :750.193	Max. : 359.281	Max. : 52273.0	Max. :60834.0

Profit/loss_t+2	Profit/loss_t+3	AssetsGrowth%_t+1	AssetsGrowth%_t+2	AssetsGrowth%_t+3	Assets_t	Assets_t+1
Min. :-3275.00	Min. :-6164.0	Min. :-65.288	Min. :-72.000	Min. :-81.056	Min. : 192	Min. : 155
1st Qu.: 12.75	1st Qu.: 14.0	1st Qu.: -2.231	1st Qu.: -4.315	1st Qu.: -5.018	1st Qu.: 3162	1st Qu.: 3328
Median : 148.00	Median : 129.0	Median : 5.697	Median : 3.181	Median : 2.385	Median : 10025	Median : 10896
Mean : 1057.18	Mean : 948.5	Mean : 9.002	Mean : 5.707	Mean : 4.198	Mean : 22252	Mean : 24004
3rd Qu.: 774.25	3rd Qu.: 701.5	3rd Qu.: 15.750	3rd Qu.: 13.275	3rd Qu.: 12.095	3rd Qu.: 20803	3rd Qu.: 23032
Max. :56150.00	Max. :53840.0	Max. :202.358	Max. :177.128	Max. :139.115	Max. :631028	Max. :622124

Assets_t+2	Assets_t+3	Capital_intensity_average	Asset_turnover_average	Equity_t	Equity_t+1
Min. : 126	Min. : 83	Min. : 0.1852	Min. :0.002073	Min. :-14198.0	Min. : -1027
1st Qu.: 3312	1st Qu.: 3267	1st Qu.: 0.7428	1st Qu.:0.572264	1st Qu.: 527.5	1st Qu.: 572
Median : 11252	Median : 10343	Median : 1.0704	Median :0.949020	Median : 2376.0	Median : 2532
Mean : 25248	Mean : 23116	Mean : 5.7577	Mean :1.048930	Mean : 8250.1	Mean : 9001
3rd Qu.: 25203	3rd Qu.: 23111	3rd Qu.: 1.8000	3rd Qu.:1.352998	3rd Qu.: 7813.0	3rd Qu.: 8339
Max. :621541	Max. :521639	Max. :251.9272	Max. :5.601887	Max. :379511.0	Max. :401579

Equity_t+2	Equity_t+3	NFP/Ebitda_t	NFP/Ebitda_t+1	NFP/Ebitda_t+2	NFP/Ebitda_t+3	NFP_t	NFP_t+1
Min. : -2308.0	Min. : -1768	Min. :-160.8807	Min. :-53.1399	Min. :-465.0425	Min. :-84.5823	Min. :-51067.0	Min. :-62561.3
1st Qu.: 580.5	1st Qu.: 636	1st Qu.: -0.8072	1st Qu.: -0.7978	1st Qu.: -1.0702	1st Qu.: -0.9117	1st Qu.: -336.1	1st Qu.: -365.9
Median : 2655.5	Median : 2814	Median : 0.5463	Median : 0.8300	Median : 0.8774	Median : 0.6340	Median : 414.3	Median : 515.1
Mean : 9900.5	Mean : 8638	Mean : 1.9079	Mean : 8.2313	Mean : -0.2402	Mean : 4.0123	Mean : 1654.1	Mean : 1543.2
3rd Qu.: 9039.2	3rd Qu.: 7814	3rd Qu.: 3.3848	3rd Qu.: 3.4505	3rd Qu.: 3.3876	3rd Qu.: 3.4482	3rd Qu.: 3118.6	3rd Qu.: 3640.7
Max. :403829.0	Max. :220350	Max. : 226.2914	Max. :908.3800	Max. : 92.6582	Max. :603.4855	Max. :103850.4	Max. : 82755.6

NFP_t+2	NFP_t+3	EBITDA/Sales%_t	EBITDA/Sales%_t+1	EBITDA/Sales%_t+2	EBITDA/Sales%_t+3	ROA%_t	ROA%_t+1
Min. :-64490.8	Min. :-36389.3	Min. :-427.890	Min. :-549.780	Min. :-523.260	Min. :-555.990	Min. :-51.860	Min. :-44.280
1st Qu.: -512.8	1st Qu.: -573.5	1st Qu.: 4.295	1st Qu.: 4.100	1st Qu.: 3.795	1st Qu.: 3.835	1st Qu.: 1.880	1st Qu.: 1.745
Median : 446.8	Median : 418.9	Median : 8.540	Median : 8.575	Median : 8.455	Median : 7.480	Median : 4.300	Median : 4.415
Mean : 1460.1	Mean : 1817.7	Mean : 11.867	Mean : 10.897	Mean : 11.076	Mean : 10.136	Mean : 6.699	Mean : 6.341
3rd Qu.: 3513.4	3rd Qu.: 3529.6	3rd Qu.: 15.960	3rd Qu.: 16.188	3rd Qu.: 17.155	3rd Qu.: 16.777	3rd Qu.: 9.350	3rd Qu.: 9.723
Max. : 80410.9	Max. :102216.8	Max. : 96.610	Max. : 95.640	Max. : 96.900	Max. : 98.970	Max. : 90.390	Max. : 88.830

```
   ROA%_t+2          ROA%_t+3          ROE%_t           ROE%_t+1          ROE%_t+2          ROE%_t+3          D/E%_t           D/E%_t+1          D/E%_t+2
Min.   :-69.730   Min.   :-96.020   Min.   :-129.00   Min.   :-141.730   Min.   :-107.800   Min.   :-144.39   Min.   :-91.030   Min.   :-376.9200   Min.   :-14.480
1st Qu.:  1.415   1st Qu.:  1.455   1st Qu.:   1.78   1st Qu.:   1.675   1st Qu.:   2.295   1st Qu.:   1.65   1st Qu.:  0.010   1st Qu.:   0.0100   1st Qu.:  0.025
Median :  4.090   Median :  3.840   Median :   6.98   Median :   8.150   Median :   8.890   Median :   7.96   Median :  0.510   Median :   0.5200   Median :  0.480
Mean   :  5.634   Mean   :  5.433   Mean   :  11.69   Mean   :  11.630   Mean   :  12.304   Mean   :  13.07   Mean   :  1.084   Mean   :   0.4091   Mean   :  1.254
3rd Qu.:  9.258   3rd Qu.:  8.572   3rd Qu.:  19.30   3rd Qu.:  19.075   3rd Qu.:  18.858   3rd Qu.:  20.31   3rd Qu.:  1.515   3rd Qu.:   1.6100   3rd Qu.:  1.480
Max.   : 93.750   Max.   : 93.460   Max.   :  97.37   Max.   :  95.570   Max.   :  97.690   Max.   :  98.16   Max.   : 66.540   Max.   :  21.2700   Max.   : 37.570

   D/E%_t+3         Debt/EBITDA%_t    Debt/EBITDA%_t+1  Debt/EBITDA%_t+2  Debt/EBITDA%_t+3  Intangibles_t     Intangibles_t+1   Intangibles_t+2 Intangibles_t+3
Min.   :-330.160   Min.   :-145.460   Min.   :-38.280   Min.   :-505.9000   Min.   :-84.600   Min.   :   0.0   Min.   :   0.0   Min.   :   0   Min.   :   0.0
1st Qu.:   0.010   1st Qu.:   0.010   1st Qu.:  0.010   1st Qu.:   0.0100   1st Qu.:  0.000   1st Qu.:   9.0   1st Qu.:   9.0   1st Qu.:   9   1st Qu.:   8.0
Median :   0.370   Median :   1.410   Median :  1.430   Median :   1.5250   Median :  1.405   Median :  75.0   Median :  80.0   Median :  99   Median :  74.0
Mean   :   1.027   Mean   :   3.632   Mean   :  7.862   Mean   :   0.6508   Mean   :  4.875   Mean   : 934.8   Mean   :1031.6   Mean   :1148   Mean   :1038.1
3rd Qu.:   1.413   3rd Qu.:   3.935   3rd Qu.:  4.180   3rd Qu.:   3.9850   3rd Qu.:  4.207   3rd Qu.: 478.5   3rd Qu.: 572.2   3rd Qu.: 619   3rd Qu.: 591.5
Max.   : 338.130   Max.   : 226.270   Max.   :877.760   Max.   :  76.2400   Max.   :608.870   Max.   :24139.0   Max.   :31814.0   Max.   :36296   Max.   :28360.0

R&Dexpenses_t  R&Dexpenses_t+1  R&Dexpenses_t+2  R&Dexpenses_t+3   PPE/Assets_t      PPE/Assets_t+1    PPE/Assets_t+2    PPE/Assets_t+3    CurrentAssets/Assets_t
Min.   :   0   Min.   :   0.0   Min.   :   0.0   Min.   :   0.0   Min.   :0.00000   Min.   :0.00000   Min.   :0.00000   Min.   :0.00000   Min.   :0.01554
1st Qu.:   0   1st Qu.:   0.0   1st Qu.:   0.0   1st Qu.:   0.0   1st Qu.:0.00713   1st Qu.:0.00697   1st Qu.:0.00598   1st Qu.:0.00537   1st Qu.:0.52736
Median :   0   Median :   0.0   Median :   0.0   Median :   0.0   Median :0.07000   Median :0.07018   Median :0.07275   Median :0.06671   Median :0.72828
Mean   : 158   Mean   : 171.7   Mean   : 200.9   Mean   : 157.7   Mean   :0.14212   Mean   :0.13988   Mean   :0.13734   Mean   :0.15831   Mean   :0.67133
3rd Qu.:   0   3rd Qu.:   0.0   3rd Qu.:   0.0   3rd Qu.:   0.0   3rd Qu.:0.21290   3rd Qu.:0.20732   3rd Qu.:0.19788   3rd Qu.:0.21104   3rd Qu.:0.87672
Max.   :9450   Max.   :9190.0   Max.   :7387.0   Max.   :7600.0   Max.   :0.98355   Max.   :0.98538   Max.   :0.98865   Max.   :0.98707   Max.   :1.00000

CurrentAssets/Assets_t+1 CurrentAssets/Assets_t+2 CurrentAssets/Assets_t+3 Operating_expenses_t Operating_expenses_t+1 Operating_expenses_t+2 Operating_expenses_t+3
Min.   :0.005479         Min.   :0.007111         Min.   :0.00762          Min.   :    17       Min.   :    25       Min.   :    19       Min.   :    22
1st Qu.:0.521335         1st Qu.:0.517017         1st Qu.:0.50040          1st Qu.:  2194       1st Qu.:  2208       1st Qu.:  2024       1st Qu.:  1942
Median :0.733666         Median :0.710095         Median :0.69841          Median :  7193       Median :  7512       Median :  7924       Median :  7328
Mean   :0.666090         Mean   :0.658138         Mean   :0.64641          Mean   : 18823       Mean   : 20023       Mean   : 20928       Mean   : 19144
3rd Qu.:0.863484         3rd Qu.:0.857167         3rd Qu.:0.84631          3rd Qu.: 18455       3rd Qu.: 20095       3rd Qu.: 22116       3rd Qu.: 20806
Max.   :1.000000         Max.   :0.996623         Max.   :0.99806          Max.   :654194       Max.   :625157       Max.   :659078       Max.   :668395

Coverage_average  Current ratio_t  Current ratio_t+1  Current ratio_t+2  Current ratio_t+3  STLiab./Tot.Liab%_t  STLiab./Tot.Liab%_t+1  STLiab./Tot.Liab%_t+2  STLiab./Tot.Liab%_t+3
Min.   :-430.250  Min.   :0.050   Min.   :0.010   Min.   :0.010   Min.   :0.030   Min.   :0.0100   Min.   :0.0100   Min.   :0.0000   Min.   :0.0000
1st Qu.:   4.228  1st Qu.:1.065   1st Qu.:1.045   1st Qu.:1.050   1st Qu.:1.097   1st Qu.:0.7050   1st Qu.:0.7200   1st Qu.:0.7200   1st Qu.:0.7100
Median :  10.978  Median :1.380   Median :1.390   Median :1.420   Median :1.440   Median :0.9000   Median :0.8800   Median :0.8700   Median :0.8700
Mean   : 103.942  Mean   :1.779   Mean   :1.800   Mean   :1.772   Mean   :1.848   Mean   :0.8172   Mean   :0.8105   Mean   :0.8064   Mean   :0.7991
3rd Qu.:  46.839  3rd Qu.:1.980   3rd Qu.:2.025   3rd Qu.:2.050   3rd Qu.:2.190   3rd Qu.:1.0000   3rd Qu.:1.0000   3rd Qu.:1.0000   3rd Qu.:1.0000
Max.   :8593.998  Max.   :9.360   Max.   :9.270   Max.   :8.640   Max.   :8.680   Max.   :1.0000   Max.   :1.0000   Max.   :1.0000   Max.   :1.0000

     ROI%_t           ROI%_t+1          ROI%_t+2          ROI%_t+3          NWC_t             NWC_t+1           NWC_t+2           NWC_t+3
Min.   :-22.190   Min.   :-27.670   Min.   :-27.910   Min.   :-24.890   Min.   :-14564.0   Min.   :-15212.0   Min.   :-18768.0   Min.   :-16975.0
1st Qu.:  3.100   1st Qu.:  2.562   1st Qu.:  2.210   1st Qu.:  2.752   1st Qu.:   138.5   1st Qu.:   132.8   1st Qu.:   162.2   1st Qu.:   152.8
Median :  7.730   Median :  7.605   Median :  7.740   Median :  6.795   Median :  1082.0   Median :  1128.5   Median :  1249.5   Median :  1267.5
Mean   :  8.976   Mean   :  9.017   Mean   :  8.371   Mean   :  8.326   Mean   :  4258.4   Mean   :  4675.4   Mean   :  5100.8   Mean   :  4308.7
3rd Qu.: 14.875   3rd Qu.: 15.945   3rd Qu.: 14.085   3rd Qu.: 14.055   3rd Qu.:  4344.5   3rd Qu.:  5070.5   3rd Qu.:  5169.5   3rd Qu.:  4820.8
Max.   : 29.980   Max.   : 29.810   Max.   : 29.300   Max.   : 29.310   Max.   : 96632.0   Max.   :103839.0   Max.   :114745.0   Max.   : 59373.0
```

Figure 3.10: Distribution of revenues

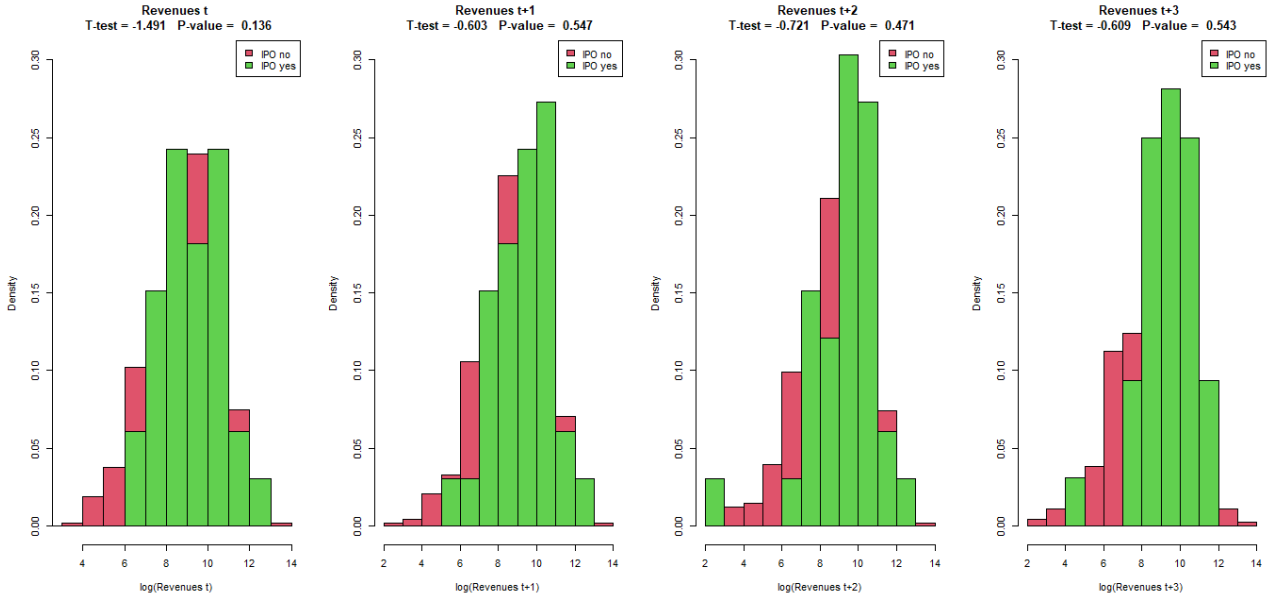


Figure 3.12: Distribution of assets

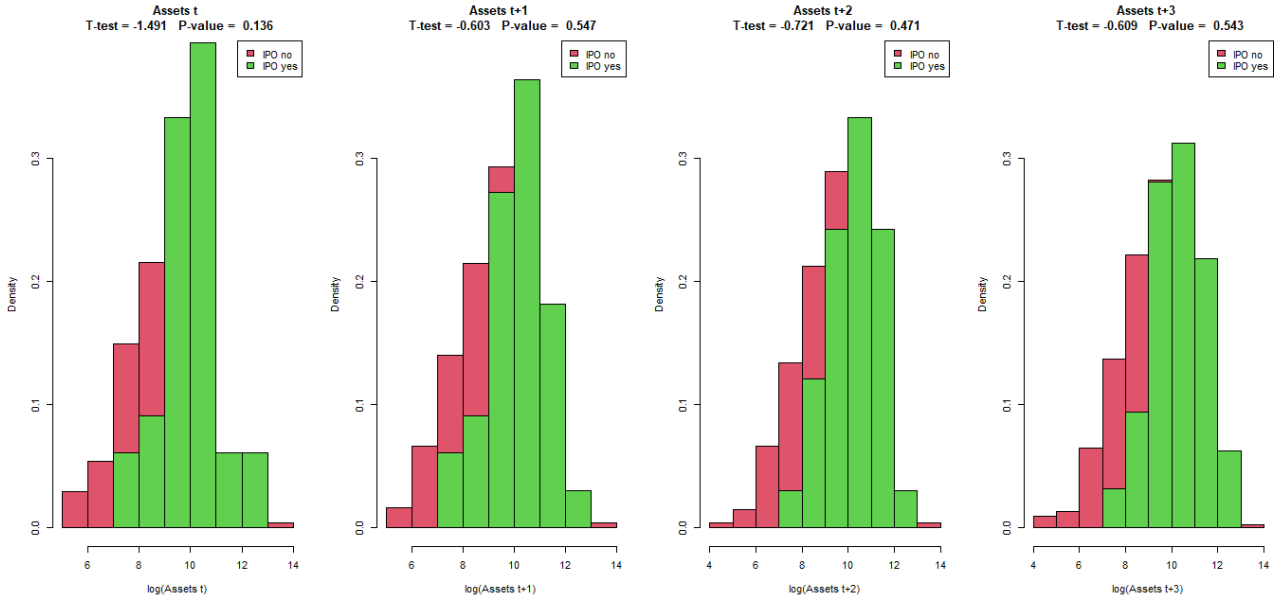


Figure 3.13: Distribution of assets growth

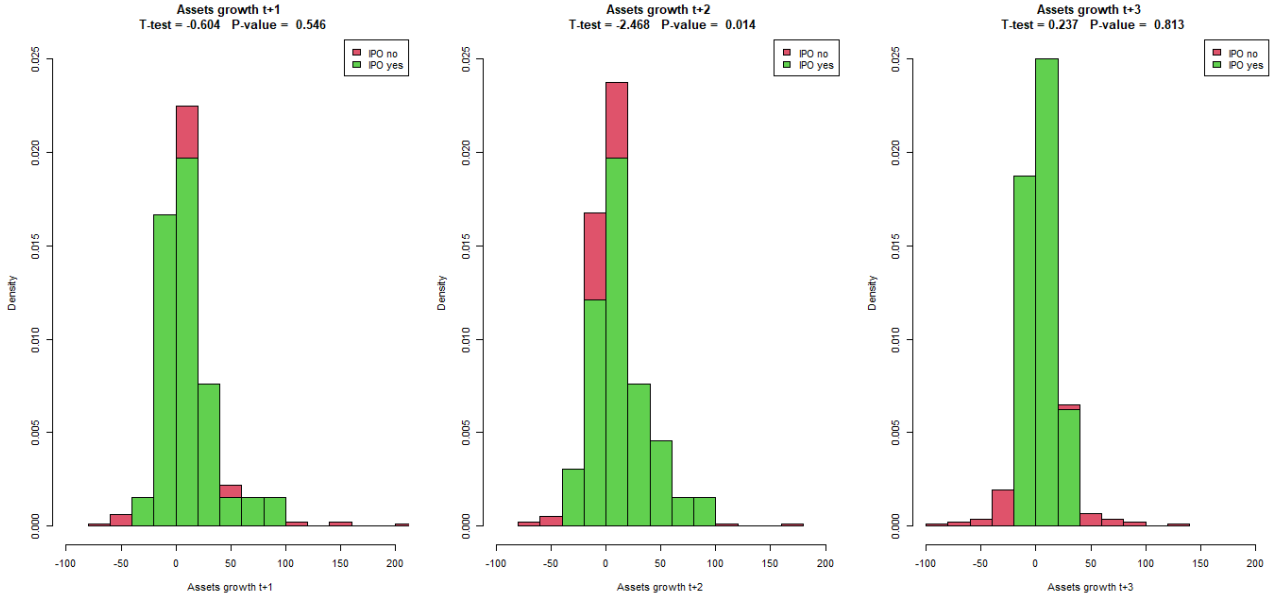


Figure 3.17: Distribution of operating expenses

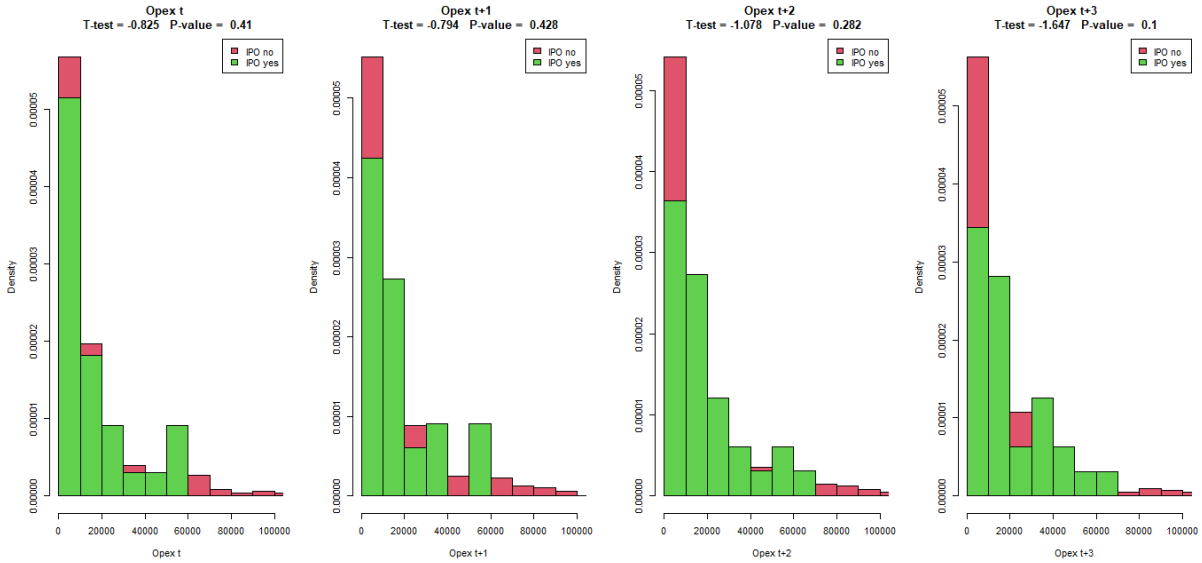


Figure 3.19: Distribution of profit/loss

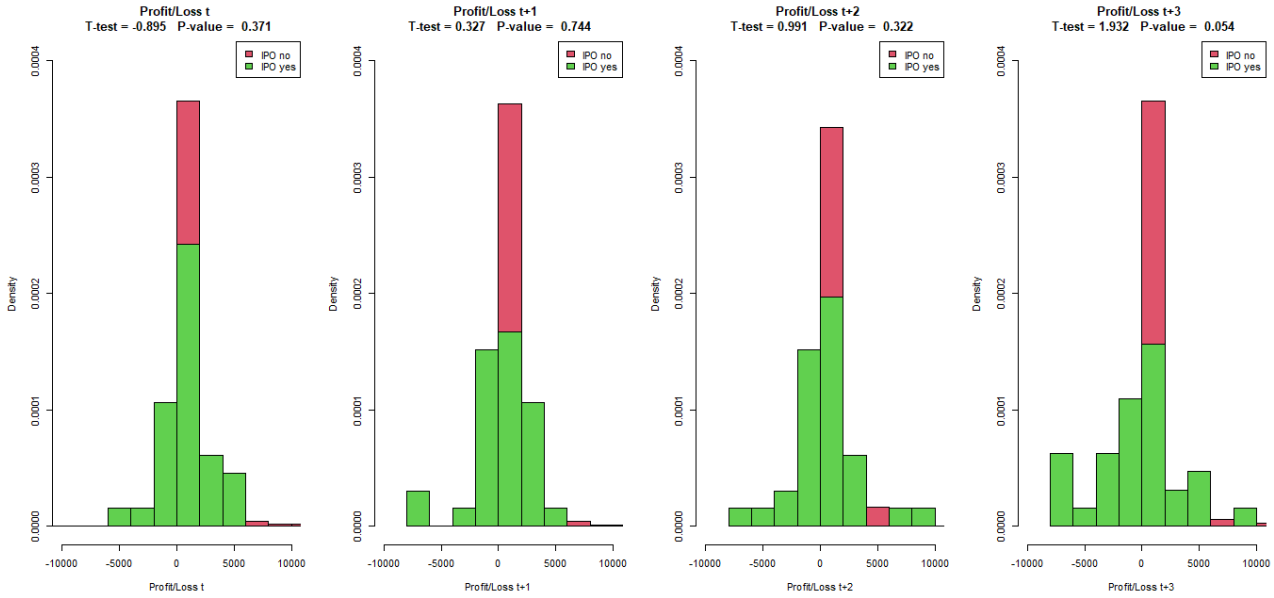


Figure 3.25: Distribution of NFP

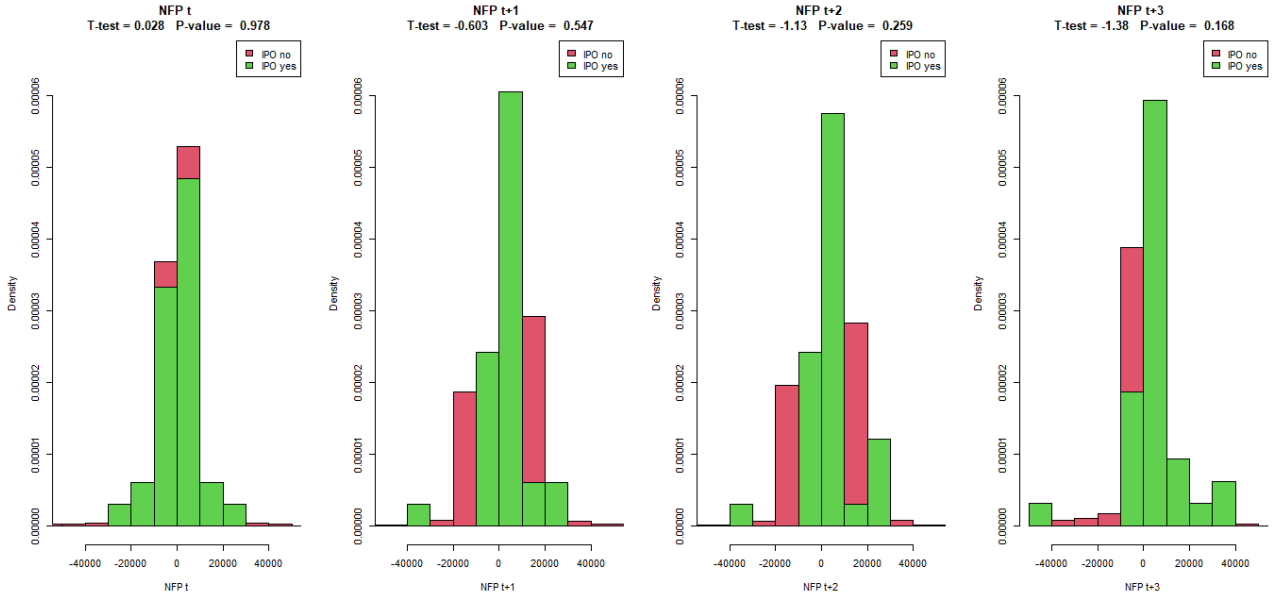


Figure 3.26: Distribution of D/E

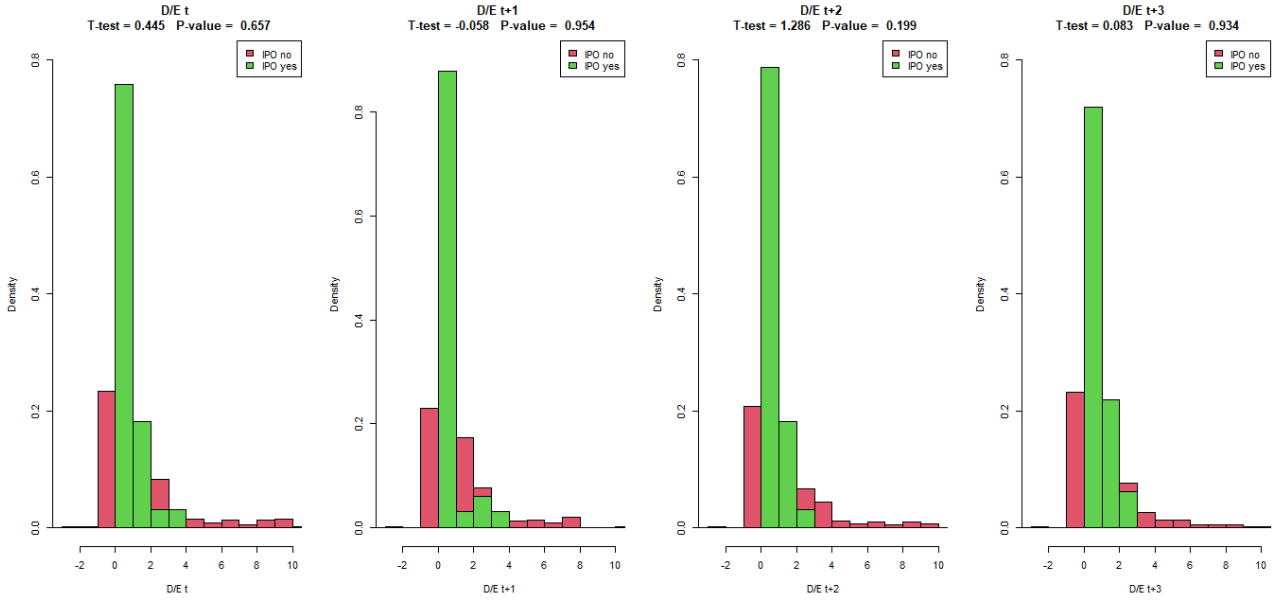


Figure 3.28: Distribution of NFP/Ebitda

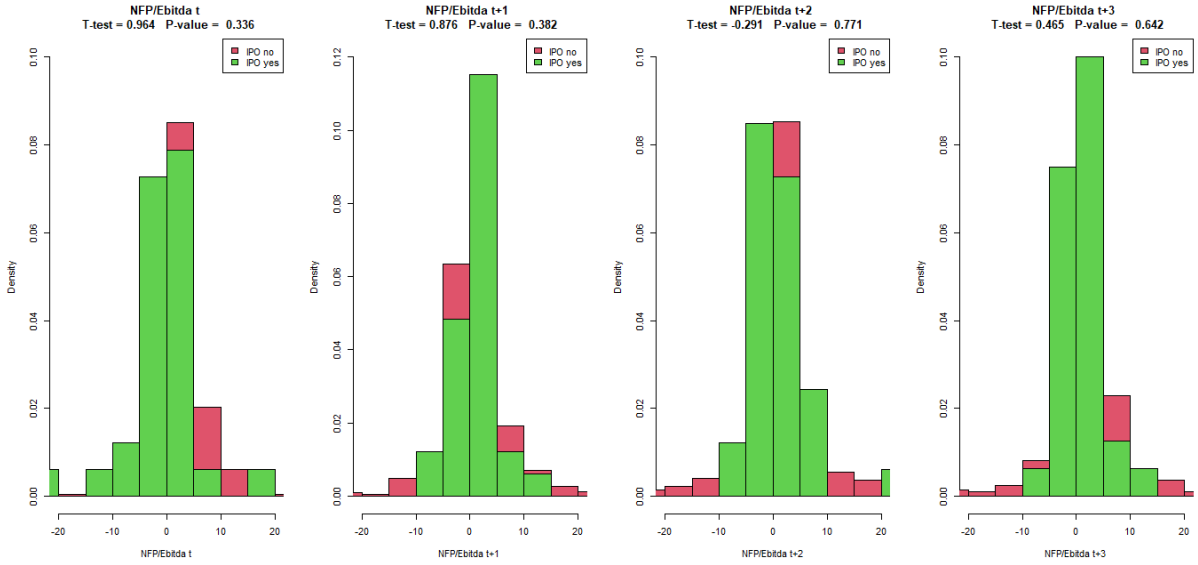


Figure 3.29: Distribution of interest coverage ratio

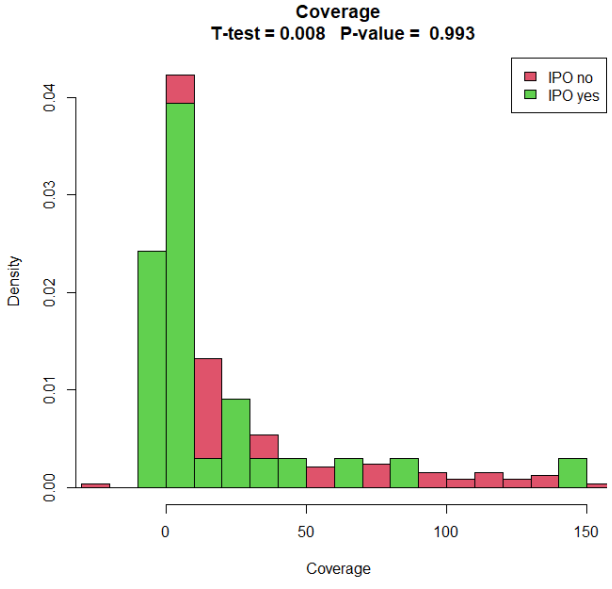


Figure 3.32: Distribution of current ratio

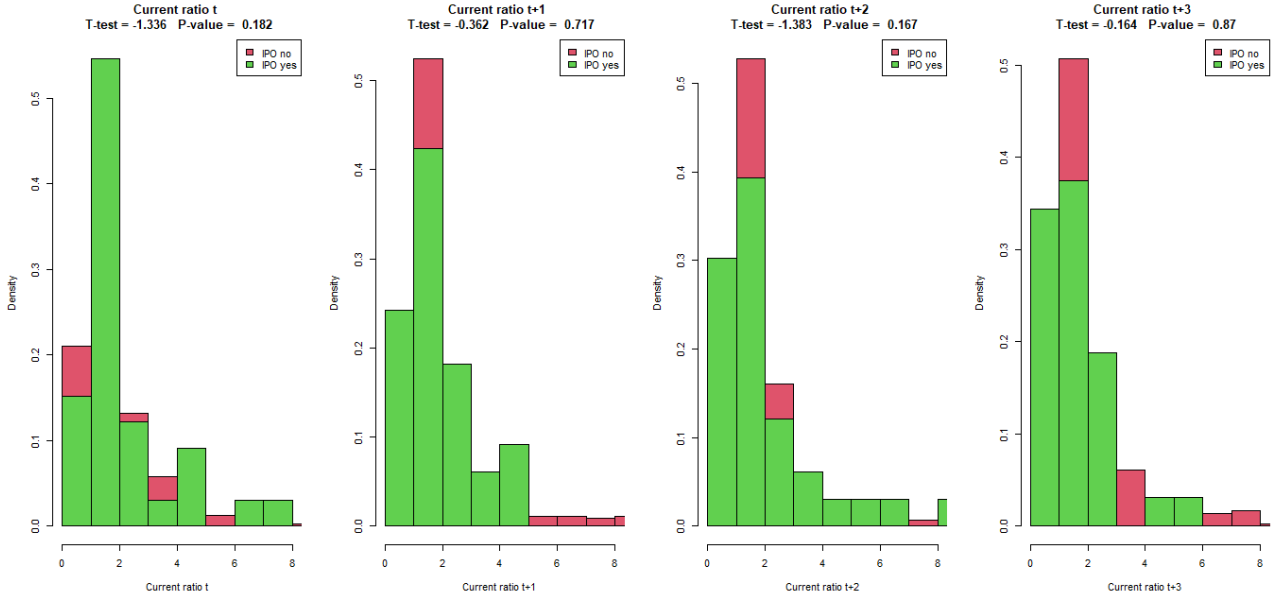
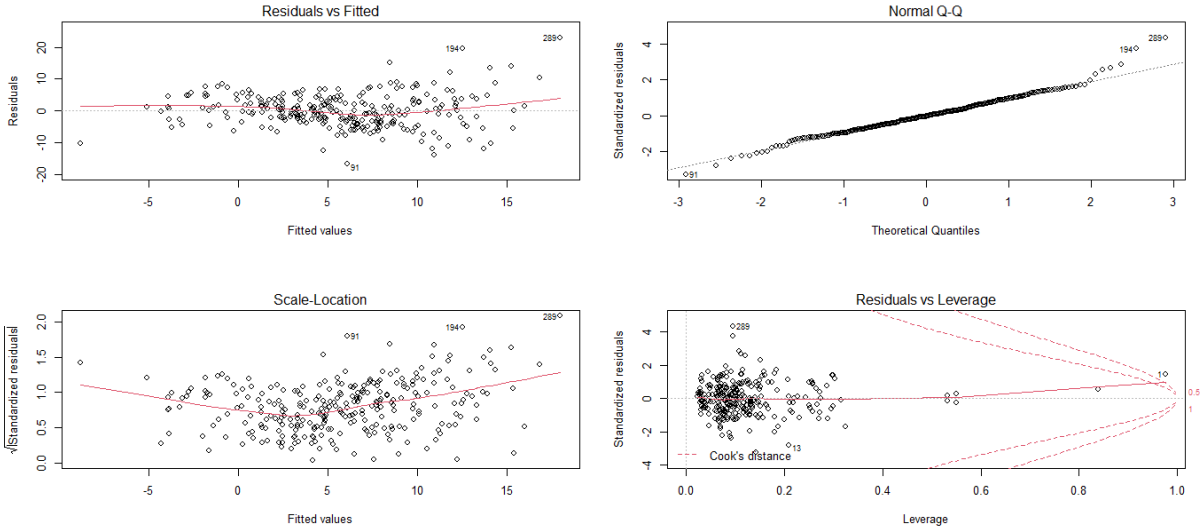


Figure 3.34a: Model plot – ROA



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