



**IS THERE A BERLIN WALL IN POST-ISSUE OPERATING PERFORMANCE
OF EUROPEAN IPOs?**

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Tese de Mestrado em Finanças

Orientada por:

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2011

About the Author

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Acknowledgements

I would like to thank mainly my supervisor, Miguel Sousa, for the big support he gave me throughout the last year. He provided me the access to the financial databases which allowed me to do this thesis. I also thank him for the valuable comments and for the very quick answers to my needs. I don't hesitate to recommend him to supervise any other thesis on the matter.

I would also like to thank the former director of the master program and professor, Manuel de Oliveira Marques, who kindly listened to me before I started the thesis and gave me advice on the subject and the supervisor for my future work.

Finally, I would like to thank my parents and my brother, the most important people in my life.

Abstract

This thesis studies the post-IPO operating performance of a sample of 555 European firms that went public between 1995 and 2006. Consistent with previous findings, we observe a decline in post-issue operating performance of IPO firms. Furthermore, firms located in European emerging markets perform worse than firms located in European developed markets, after the IPO. Also, firms in which the original investor retains fewer shares after the IPO perform better than firms in which the original investor retains higher proportion of shares after the IPO, while underpricing seems to have no effect in post-issue operating performance. Market-to-book ratios and price-earnings ratios of IPO firms tend to fall after they go public, which suggests firms explore windows of opportunity to go public. Effects of the IPO in the capital structure are brief and disappear over time.

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1. Introduction

The focus of this thesis is the post-issue operating performance of European firms¹ that completed an initial public offering (IPO). As pointed out by Jain and Kini (1994), although there are many studies investigating post-issue stock price performance, studies focusing post-IPO operating performance are rare. In 2010 the state of art of the IPO literature didn't change a lot. So, this study of the post-issue operating performance of European IPO firms fills a gap in the literature.

The current macroeconomic scenario and the borrowing constraints faced by the European companies originated a growing number of articles in newspapers referring an eventual new IPO wave and the potential benefits of IPOs². These facts increase the importance of this thesis.

We mostly follow Jain and Kini (1994) methodology³ and split our sample in several subsamples, according to the proportion of shares retained by the original investor and the IPO underpricing. The first trend we find in our data is the significant number of IPOs occurred in Eastern European countries, especially Poland. Given that fact we also split out sample by geographic market, more specifically between IPOs from European developed countries and IPOs from European emerging countries.

Indeed, in Ernst & Young Global IPO Trends 2010, Warsaw – NewConnect market (Poland) appears in the top 5 exchanges by number of deals, in 2008. From that report, we figure out Korean, Chinese and Hong Kong IPO markets are “hot” IPO markets. All of them are emerging countries. Hence, beyond replicating Jain and Kini (1994) study for European IPOs, we introduced the possibility of a different post-IPO operating performance between firms from European developed countries and from

¹ “Firm” and “company” will be indistinctively used along this study and refers to the company whose shares became listed in a stock exchange due to an initial public offering.

² See, for example, an interview with the CEO of NYSE Euronext, Duncan Niederauer, in Portuguese newspaper Expresso, on November 13th 2010.

³ The sample used by Jain and Kini (1994) includes 682 IPOs occurred in the United States between 1976 and 1988, while our study concentrates in IPOs by European countries, between 1995 and 2006

European emerging countries. Evidence shows there are some significant differences in post-IPO operating performance between the two groups of firms.

Previous studies have already studied the correlation between stock markets development and the growth of the economy (e.g. Choe et al., 1993; Pagano, 1993). Choe et al. (1993) document that, historically, the number of firms issuing common stock is higher in expansionary phases of the business cycle. They developed a model in which business cycle variables have a significant explanatory power in the magnitude of stock returns and the magnitude of stock returns is related to the volume of equity issues. Given the fact that, according to OECD Statistics⁴, Polish real GDP has grown 3.6 % in 2005 and 6.2 % in 2006, this could be an explanation for the Polish hot IPO market.

On the other hand, Pagano (1993) argues not all the countries in the same economic stage have the same stock market size. He points out the most important determinants of stock market size are the institutional and regulatory arrangements. He also discusses the differences between the regulatory framework in Anglo-Saxon stock markets and Continental Europe stock markets.

Earlier this year, the British newspaper The Guardian⁵ celebrated the 20th anniversary of Polish stock market in a special issue dedicated to Poland, stated that there are more than 400 listed companies on the main market. This growth was a consequence of a well succeed privatization program and the aim of the Warsaw stock exchange is to become a financial hub in Eastern Europe, the president of the exchange said.

However, Silviu (2008), in a review of Romanian IPOs, shows Romanian IPO market is a “cold” one. The explanations are the mass privatization program, which created an “overcrowd” effect in Bucharest Stock Exchange and prevented other companies to go public, the competition from other equity investors, such as abroad stock exchanges (e.g. London Stock Exchange), venture capitalists or private equity funds, and the lack of knowledge on financing through capital markets.

⁴ Available on <http://stats.oecd.org/Index.aspx>

⁵ See <http://www.guardian.co.uk/world/2011/apr/05/warsaw-stock-exchange-poland>. Retrieved on September 25th 2011.

Moreover, the pre- and post-IPO information on performance and characteristics of the IPO firms may help to understand why companies go public as suggested by Pagano et al. (1998). Thus, we present a review of the literature regarding the motivations, the advantages and the disadvantages for going public that our results can confirm or reject. For instances, our results show that capital expenditures increase significantly in the first year after the IPO, relative to the IPO year, which suggest companies use the proceeds to finance new investments.

Another important aspect of this thesis is that it covers all IPO activity occurred in all European countries, during the same period. Existing literature in this field is wide, but it mainly focuses in specific country (e.g. Burgstaller, 2009, in Austria; Huyghebaert and Hulle, 2006, in Belgium; Pagano et al. 1998, in Italy; Duque and Febra, 2002, in Portugal), with different methodologies and different time windows. This fact makes difficult, if not impossible, the comparison between them. Furthermore, our study provides a better knowledge of IPOs in the Eastern Europe countries, which could be valuable for entrepreneurs interested in investing in those locations.

The thesis is organized as follows. Section 1 introduces the thesis. Section 2 presents a literature review regarding the benefits and costs of IPOs and the post-IPO performance. Section 3 describes the data sources and presents the sample summary statistics. Section 4 presents the methodology used while Section 5 reports the empirical results. Section 6 provides evidence on market expectations and capital structure after IPO. Finally, Section 7 concludes.

2. Literature Review

In this section, we first present the benefits and the costs of going public. Afterwards, we discuss the post-issue operating performance of IPO firms, the main topic of this thesis.

Ritter and Welch (2002) point out two kinds of IPO theories in the existing literature: life cycle theories and market-timing theories. Life cycle theories are concerned with the life cycle of the firm, while market timing theories are related to the stock exchange performance. These two kinds of theories complement each other: firms go public in response to positive market conditions, but after a certain stage of its life cycle, they conclude.

This is consistent with Pagano et al. (1998) findings. Using a sample of Italian firms, they find the most important reason to go public is the industry market-to-book ratio. Companies from industries with high market-to-book ratios are more likely to go public. Still according to Pagano et al. (1998), the second most important reason to go public is the size of the firm, which can be a proxy for the stage firms are in their life cycle. They also conclude that companies reduce their cost of credit and borrow from a larger set of banks after going public.

Bancel and Mittoo (2009) document there isn't a single theory to explain why companies go public. They suggest the motivations of the going public decision are influenced by the ownership structure of the company, age, size and by the regulatory framework of the home country. Finally, they present various theories regarding the advantages and disadvantages of flotation, which we sum up.

2.1. Benefits of going public

a. Raising funds for growth and overcoming borrowing constraints

The IPO only benefits the issue company, in terms of capital raised, if new shares are issued by the company to be sold in the IPO (“primary” offering). The selling of existing shares by initial shareholders in an IPO doesn’t raise equity capital for the firm. Given this fact, an IPO is, for sure, a way to change shareholder structure, but not always a way to raise equity capital.

However, the existing literature provides strong support for the hypothesis that an IPO benefits the company as allow them to raise funds to induce growth and overcome borrowing constraints. Recently, Kim and Weisbach (2008) conduct an international study on this topic that includes IPOs and SEOs (Seasoned or Secondary Equity Offerings) occurred in 38 countries¹ and concluded that they raise capital mostly for new investments. Moreover, they also find firms go public to take advantage from favorable market conditions.

According to Ritter and Welch (2002), firms go public to raise equity capital and to create a public market for shareholders to convert their wealth in cash, in the future².

Pagano et al. (1998) add that an IPO may help companies overcoming borrowing constraints. They argue that high leverage increases the likelihood of an IPO. They conjecture that levered companies, with need of capital for future investments, should see capital markets as an opportunity to access financing they don’t get otherwise. However, contrary to this expectation, empirical results showed a negative correlation (although not statistically significant) between firm leverage and the likelihood of an IPO.

¹ Countries are from North America, Latin America, Europe, Asia and Oceania.

² Change in control is other motivation for companies to go public and is explained below.

b. Greater Bargaining Power with Banks and Financing Flexibility

Another advantage of an IPO is the increased bargaining power with banks and financing flexibility. Rajan (1992) argues that when a firm borrows from multiple sources limits the creditors' power to extract value from their activity. By going public, companies get an alternative source of financing and the competition between new and older sources will lower the cost of capital.

According to Pagano et al. (1998), independent companies benefit from decrease of 30-55 basis points in their cost of credit, in the IPO year and in the following three years.

c. Investor Recognition and Liquidity

Merton (1987) shows that in the presence of incomplete information, investors will only hold securities issued by companies they know about. He also shows that, the greater is the investors' awareness of the existence of specific shares, the higher is the share price. Hence, by going public, the company increases the set of potential investors.

Regarding liquidity, Huyghebeart and Hulle (2006) report that a stock liquidity can reduce the cost of capital. They support their statement in previous research such as Eckbo et al. (2000) and Maug (1998).

d. Monitoring

The market discipline induces managers to take better decisions. For instance, Holmström and Tirole (1993) show that stock exchange listing influences managerial incentives. First, a firm with poor performance is more likely to be acquired and, consequently, the managers will be dismissed. Second, it allows stock performance

based compensations that mitigate managers and owner conflicts and align their interests.

In favor of this motivation to go public, Bancel and Mittoo (2009) find that the improvement of external monitoring is, for large European companies, the most important advantage of going public. On the contrary, according to Brau and Fawcett (2006), monitoring is the main motive to stay private in the U.S. since the predisposition to managerial entrenchment is higher in larger, older and far from high-tech environment firms.

e. Exit Strategy/ Divestment/Change of Control

Zingales (1995) argues that an IPO can be used as a first step in an eventual sale of a company. He argues that, by making an IPO before proceed to the total sale of the company, original investors can maximize the value received.

Pagano et al. (1998) also find evidence that support this motivation. They observe significant control transfers after the IPO. According to their findings, turnover of control in newly listed firms is twice as high as in the all Italian economy.

Mello and Parsons (1998) state IPOs are a good method to sale shares to small investors, but not to sale the control. However, they add, IPOs provide significant information to set the conditions under which the control of the company will be sold and so it can be seen as a step in a complex selling process. Because it reveals valuable information, it's always a good decision, they emphasize.

More recently, Lyandres et al. (2009) consider an IPO a stage in a takeover process. They argue that the initial owner may not know the value of his company and in order to reduce the valuation uncertainty, he can drive the firm public. Daily market capitalization decreases valuation uncertainty and so it leads to a better acquisition strategy and enhances the value of the company.

Finally, IPOs are an important exit route for venture capitalists. As documented by Geddes (2003), flotation is an optimal method for professional investors, such as venture capitalists or private equity funds, to exit and maximize proceeds.

f. Windows of Opportunity

Ritter (1991) find that companies go public near the peak of industry-specific fads and Loughran and Ritter (1995) argue that companies issue shares when they are overvalued. Baker and Wurgler (2000) achieve similar results and find that companies tend to issue capital before period of low returns. Moreover as we have seen before, Pagano et al. (1998) find high industry market-to-book ratios as the main motivation to go public. All this research is consistent with the windows of opportunity's hypothesis. This hypothesis is also confirmed by Pástor and Veronesi (2005) that state IPO waves are “preceded by high market returns and followed by low market returns”. When stock prices drop, IPO volume declines because firms wait to more favorable market conditions to go public. They also find some support for industry-clustering of IPOs.

Underlying these findings, on November 23rd 2010, Jornal de Negócios Online provided some results from a survey conducted by NYSE Euronext, Ernst & Young and IAPMEI (Portuguese Institute of Support to Small and Medium Enterprises and Innovation) about the going public decision. Almost 80% of the inquired companies unveil the desire to list and 56% think the decision could be influenced by market conditions.

2.2. Costs of going public

Costs of going public can be divided between direct and indirect costs. Direct costs are mostly the expenses companies have with the going public process, such as underwriting and registration fees and indirect costs are related with the loss of confidentiality and the underpricing.

a. Direct costs/Transaction Costs

Ritter (1987) estimates the direct expenses of going public are equal to \$250,000 (a fixed cost) plus 7% of the gross proceeds (a variable cost).

Later, Chen and Ritter (2000) emphasize more than 90% of deals raising up between 20 and 80 million dollars have an exact gross spread of 7%. They also argue U.S. IPO gross spreads are twice as high as in other countries. Indeed, Pagano et al. (1998) find a spread of 3.5% for Italian IPOs and Abrahamson et al. (2011) confirm the gap between both markets and find that the gross spread of 7% “is now the norm for IPOs raising up to \$ 250m”.

Torstila (2003) argues that the clustering of IPO gross spreads is not an exclusive of U.S. IPO markets and shows the median gross spread for European IPO market is 4% of the gross proceeds. Jenkinson and Jones (2009) document that European IPO fees are around 4% for the smallest issues and 2% for the largest.

b. Indirect Costs

i. Loss of Confidentiality

Yosha (1995) shows that firms that are more afraid of disclose information tend to reject stock markets. Stock exchange listing requirements force companies to provide financial and strategic information to potential investors. Due to these requirements, public firms can lose competitive advantages to their private competitors.

Maksimovic and Pichler (2001) also point out the choice between public or private finance is important because each is related to a distinct level of disclosure of the issuer’s proprietary information.

ii. Asymmetric Information

The IPO literature on asymmetric information is vast and usually related to IPO underpricing³. Even after the marketing of the IPO, original shareholders possess private information about the company, while new shareholders don't. This asymmetric information between insiders and outsiders leads to problems such as moral hazard or adverse selection (Chemmanur and Fulghieri, 1999).

Regarding moral hazard, Leland and Pyle (1977) show that entrepreneurs can't be completely straightforward about their characteristics, otherwise they don't get the funds they need. However, they show that the confirmation of true characteristics by outsiders can be costly.

Adverse selection occurs because the market attributes an average value to all companies because cannot differentiate them. Without further information transfer, good quality companies wouldn't go public, because they would be undervalued by the market. On the other hand, bad quality companies would go public, because they would be overvalued by the market. Therefore, good quality companies should signal their strengths to the market. Leland and Pyle (1977) demonstrated the entrepreneur's will in invest in his own project is a sign of its good quality. And literature on post-IPO ownership confirms initial owners retain a large fraction of shares (e.g. Brennan and Franks, 1997; Mikkelson et al., 1997; Pagano et al., 1998). Other authors suggest that the underpricing can be that sign. We discuss this in the next section.

2.3. Post-IPO Performance

We divide post-IPO performance literature in short-run performance and long-run performance. In short-run performance, we discuss the underpricing and, in long-run performance, we present previous conclusions on financial and operating performance of IPO firms.

³ See Ritter and Welch (2002) on IPO pricing.

a. Short-run performance

IPOs short-run performance is dominated by the underpricing phenomenon that several theories have tried to explain throughout the years. Most of those theories are related to the signaling hypothesis of the underpricing. According to this hypothesis, asymmetric information between issuers and investors doesn't allow investors to evaluate correctly the issuing companies. Hence, good quality companies should signal to the market its strengths. However, to be effective, the signal has to be costly and not replicated by bad companies. Several authors support the hypothesis that underpricing can be one of those signs.

Welch (1989) develops a model that shows that good quality firms can underprice their issues because the cost of underpricing in good quality firms is lower than in the low quality firms. Similarly, Grinblatt and Hwang (1989) also develop a model in which underpricing is the equilibrium outcome in a market with asymmetrically informed agents.

More recently, Francis et al. (2010) says signaling matters in determining IPO underpricing. He refers that underpricing plays as important role in signaling the quality of the firms. This fact is more important for those companies with problems in accessing external capital markets and those companies that face higher information asymmetry.

Nevertheless, this is a very controversial issue in the IPO literature. For instance, Jegadeesh et al. (1993) found low support for the signaling hypothesis as the main cause of underpricing and Michaely and Shaw (1994) also show empirical evidence contrary to this hypothesis. Instead, they say firms that underprice are worst companies that tend to have poorer results in the future and distribute fewer dividends.

Ritter and Welch (2002) realize the existence of some attempts to correlate long-run performance with pre-IPO characteristics, but state there is no reliable links between underpricing and long-run performance.

Loughran and Ritter (2004) show that underpricing had changed over time, from a mean of 7 % in the 1980s to a mean of 12 % after the internet bubble period. During the internet bubble, underpricing rose dramatically. Jain and Kini (1994) also document a mean underpricing of 7.25 %.

b. Long-run performance

i. Financial performance

Numerous studies (e.g. Ritter, 1991; Ritter and Welch, 2002) show that there is a long-run stock underperformance of IPO firms. Ritter (1991) argues this stock behavior after the IPO is consistent with the overoptimism that surrounds the IPO market and with the windows of opportunity hypothesis.

Ritter and Welch (2002) suggest that one explanation for the long-run financial underperformance may be the high expectations investors have regarding the IPO firm. At the time of IPO, investors are usually very optimistic about the prospects of the firm. However, in the long-term, the optimism decreases and the stock price drops, leading to a long-run underperformance.

Cogliati et al. (2011) find that overoptimism is even implicit in the cash-flow growth rates used in the Discounted Cash Flow models (DCF) that are higher than real growth rates. This overoptimism leads to a median offer price overvaluation of 74%, for their sample of French, German and Italian IPOs. They also notice that the post-IPO stock price underperformance is larger for issues whose estimated growth was more upward biased.

Finally, Jain and Kini (1994) suggest that IPOs seem to be priced under the assumption that profit margins will grow after the IPO but, instead, they decline. They observe a fall in market-to-book ratios, price-earnings ratios and earnings per share for their sample after the IPO.

ii. Operating performance

Regarding IPO firms' operating performance, Degeorge and Zeckhauser (1993) document a decrease in the operating performance after IPO and were the first to introduce the "window-dressing" hypothesis in order to explain it. These authors suggest there could be a performance manipulation in the pre-IPO year, in order to make the offering more attractive to investors. Indeed, in their study, companies outperform matched firms before issue, but underperform afterwards.

Jain and Kini (1994) also document a decrease in the operating performance after IPO. They show that IPO firms exhibit lower levels of operating returns (measured by EBITDA) on assets, operating cash flows (EBITDA-CAPEX) over total assets and asset turnover in post-IPO years in comparison to the fiscal year before IPO. They argue this declining performance is correlated with the change in control, due to the potential for agency costs increase, but it is also correlated with the market timing and the window-dressing hypotheses. According to the market timing hypothesis, firms go public in the presence of favorable market conditions, while according to the window-dressing hypothesis, managers attempt to make accounting numbers more attractive for the IPO.

Mikkelsen et al. (1997) also find a decline in the operating performance after the IPO but they conclude that declining is not related to ownership changes. They think post-issue operating performance is mostly explained by the age and size of the firms. They document small and start-up companies perform below industry-matched firms while larger and established companies performance is equal to the industry-matched firms' performance.

Pagano et al. (1998) also find a decrease in accounting measures of performance. They observe, on their sample of Italian firms, a decline in the return on assets equal to 1.5% in the first year after the IPO and 3% in the third year after IPO.

3. Data sources and sample description

In this section, we explain how the sample and the data were collected and we present the main descriptive statistics.

3.1. Sample selection

To collect our IPO sample and the IPO firms' financial data, we used Capital IQ database. We "screen" the data using the following criteria:

- 1) **Transaction Primary Features:** "Public Offering – IPO";
- 2) **Geographic Locations (Target/Issuer)¹:** "Europe";
- 3) **Industry Classifications (Target/Issuer):** "Energy OR Materials OR Industrials OR Consumer Discretionary OR Consumer Staples OR Healthcare OR Information Technology OR Telecommunication Services OR Utilities";
- 4) **Public Offering Security Types:** "Common Stock";
- 5) **Transaction Status:** "Closed";
- 6) **Public Offerings Offer Date:** [1/1/1995-31/12/2006];

As it can be seen by the third criteria, we exclude firms belonging to the Financials industry (mainly banks and insurance companies). As is Pagano et al. (1998), those firms were excluded because of the differences in their accounting information and nature of operations.

¹ Capital IQ query by Geographic Location relies on Primary Office Location of companies, which can lead to a potential selection bias.

We select the period between 1995 and 2006, because it is very difficult to obtain accounting data before that and because we need at least three years of accounting data after the IPO in order to study post-IPO operating performance.

Given these constraints, Capital IQ retrieved 576 companies which went public between 1995 and 2006. Of these, we excluded 18 that went public in over-the-counter (OTC) markets, 2 that were Special Purpose Acquisition Companies (SPACs) and 1 that was a conglomerate. Thus, our final sample consists of 555 IPOs.

Most of the companies listed in OTC markets don't meet the necessary listing requirements for trading on a stock exchange and the accounting data about those companies is very poor. The majority of their securities are penny stocks and most of those companies were listed in USA, on Pink Sheets LLC and OTC Bulletin Board.

SPACs are a special case of cash-shell or blank-check companies that are created by a group of investors that, at the time of the IPO, don't have any activity (Jenkinson and Sousa, 2009). Finally, the conglomerate was excluded because it would be difficult to match the firm with one sole industry.

The sample was then split between European developed markets and European emerging markets, according to Capital IQ classification². According to that classification, from the 555 IPOs, 464 took place in European developed markets and 91 occurred in European emerging markets.

3.2. Sample description

Table I, Panel A, shows the number of IPOs per year. As we can observe 433 of the 555 IPOs occurred in 2005 and 2006. This fact is consistent with IPO waves and the widely studied fact that firms go public in the presence of good market conditions. For

² Capital IQ considers European emerging markets the following countries: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Malta, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Ukraine and Serbia & Montenegro and European developed markets the following countries: Andorra, Austria, Belgium, Channel Islands, Cyprus, Denmark, Finland, France, Germany, Gibraltar, Greece, Greenland, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Monaco, Netherlands, Norway, Portugal, San Marino, Spain, Sweden, Switzerland, United Kingdom and Vatican City.

instances, Benninga et al. (2005) developed a model which corroborates that waves in IPOs occur in times of high stock prices, like the period between 2005 and 2006.

Another interesting fact is that, although 96.70% of the IPOs from European emerging markets took place in 2005 and 2006, only 74.35% of IPOs occurred in European developed markets took place in these years.

Table I, Panel B, presents some characteristics of our IPO sample. The mean of gross proceeds raised by the issuing firms is equal to 255 million dollars (194 million euros) while the median is equal to 45 million dollars (34 million euros)³.

The firms mean (median) age⁴ at flotation is 26 years (12 years). Pagano et al. (1998) report, for their sample of Italian IPO firms, a mean value of 33 years and a median value of 26. Huyghebaert and Hulle (2006) document a median age of 18 years for Belgian companies and, in the USA, Loughran and Ritter (2004) conclude that the median age has stayed constant, with temporary exceptions, at about 7 years, during the period 1980-2000.

The proportion of the firm retained by original owners after the IPO (alpha) like in Jain and Kini (1994) is calculated under the assumption that the overallotment options, if any, are not exercised and is the difference between the number of shares outstanding after IPO and the number of shares offered as a percentage of the number of shares outstanding after IPO. The mean (median) alpha of our sample is 68.13% (71.06%) which is similar to Jain and Kini (1994) that find a mean (median) alpha equal to 71.04% (73.12%) for their sample.

Finally, the mean (median) initial return is 5.49% (3.05%), which suggests the issues are on average underpriced, a common feature in the IPO literature. Jain and Kini (1994) report a mean (median) initial return of 7.25% (1.17%).

Table I, Panel C shows the number of IPOs by company nationality while Panel D reports the number of IPOs by industry. Although the IPOs in our sample involved firms from more than 30 countries, as expected almost 2/3 of the IPOs happened in just 6 countries. It's no surprise either that Information Technology companies rank first in

³ 1USD = 0.76075 EUR

⁴ Defined as the difference between the IPO year and the founding year.

the number of IPOs by Industry Classification. As Pagano et al. (1998) and Chemmanur at al. (2010) state, riskier firms are more likely to go public. Industry clustering is also a phenomenon observed in IPO waves.

Table I: Sample Summary Statistics

Panel A shows the number of issues per year while Panel B presents some characteristics of IPO sample. Panel C reports the number of IPOs by firm nationality and Panel D the number of IPOs by Capital IQ industry classification. The sample of IPO firms was taken from Capital IQ database following the criteria set earlier in this thesis. Size of issue represents the gross proceeds raised at the IPO. Age is the age of the company at the time of the IPO and is defined as year of the IPO minus year of incorporation. Alpha is the fraction of equity retained by the original owners of the company after the IPO. Alpha is the difference between the number of shares outstanding after IPO and the number of shares offered as a percentage of the number of shares outstanding after IPO. As in Jain and Kini (1994), it is computed under the assumption that the overallotment options, if any, are not exercised. Initial Return is the first-day closing price minus the offering price as a proportion of the offering price. All we needed to calculate Age, Alpha and Initial Return was available from Capital IQ or online, in the website of the companies and the stock exchanges.

Panel A: Number of Issues per Year	
Year	Number of Issues
1995	7
1996	4
1997	14
1998	15
1999	16
2000	28
2001	13
2002	6
2003	3
2004	16
2005	167
2006	266
Total	555

Panel B: Characteristics of IPO Sample

<i>Variable</i>	Mean	Median	Std. Dev.	Min	Max	Obs.
Size of issue (\$ million)	254.96	44.61	813.56	0.48	10420.76	551
Age (years)	25.68	12.00	35.25	0.00	228.00	530
Alpha (%)	68.13	71.06	18.29	0.00	98.47	510
Initial return (%)	5.49	3.05	30.72	-88.72	426.53	500

Panel C: Number of IPOs per Firm Nationality

Country	Number of Issues
France	95
Germany	82
Poland	61
Sweden	53
United Kingdom	37
Italy	33
Norway	27
Belgium	27
Greece	25
Netherlands	18
Switzerland	17
Denmark	11
Russia	9
Finland	8
Austria	8
Spain	7
Ireland	6
Estonia	5
Bulgaria	5
Other (13)	21
Total	555

Panel D: Number of IPOs per Capital IQ Industry Classification

Industry Classification	Number of Issues
Information Technology	130
Consumer Discretionary	112
Industrials	105
Healthcare	80
Energy	32
Materials	31
Consumer Staples	31
Telecommunication Services	22
Utilities	12
Total	555

Jain and Kini (2006) study the industry clustering phenomenon. They say a good market reaction to a previous IPO by an industry competitor may lead other firms in the same industry to go public earlier than planned. Contrary, a cold reaction to a previous IPO by an industry rival could delay the going public decision of the other firms in the same industry. They find IPO clustering is more likely to happen in high growth and R&D intensive industries, definition that suits Information Technology firms.

4. Methodology

To measure operating performance, we used six cash-flow variables¹: (1) operating return on assets ($EBITDA^2/Total\ Assets$); (2) operating return on revenues ($EBITDA/Total\ Revenues$); (3) operating cash flows, defined as $EBITDA-Capital\ Expenditures$, as a percentage of assets ($Operating\ cash\ flows/Total\ Assets$); (4) operating cash flows as a percentage of revenues ($Operating\ cash\ flows/Total\ Revenues$); (5) $Capital\ Expenditures/Total\ Assets$ and (6) $Capital\ Expenditures/Total\ Revenues$. Accounting data is available from Capital IQ and Compustat Global and it is measured at the end of fiscal year.

As in other studies (e.g. Kaplan, 1989) medians are used rather than means as the measure of central tendency throughout the thesis to control for outliers that dominate the means.

We mostly followed Jain and Kini (1994). Hence, we measure the median change in operating performance as the median change in levels. For instance, median change in operating return on assets is the median value of [operating return on assets $_i(t) - operating\ return\ on\ assets\ _i(-1)$], where i represents a company, -1 represents the fiscal year prior to the IPO and t represents a post-IPO fiscal year end. Median industry-adjusted change in operating performance is also measured in levels. For example, median industry-adjusted change in operating return on assets is the median value of [operating return on assets $_i(t) - operating\ return\ on\ assets\ _i(-1)$] minus [industry operating return on assets $_i(t) - industry\ operating\ return\ on\ assets\ _i(-1)$]³, where, once again, i represents a company, -1 represents the first year prior to the IPO and t represents a post-IPO fiscal year end. We repeated the procedure for the remaining five cash-flow variables.

¹ These measures were used in earlier studies on operating performance such as Kaplan (1989), Jain and Kini (1994) and Guo et al. (2011). From these three papers, Kaplan (1989) and Guo et al. (2011) focus on the post-buyouts operating performance and only Jain and Kini (1994) focus in post-IPO operating performance.

² EBITDA - Earnings Before Interest, Taxes, Depreciation, and Amortization.

³ Industry operating return on assets is the median value of individual operating returns on assets in the same two-digit SIC code. The same happen for the remaining five cash-flow measures.

In order to collect industry operating performance measures we have used Capital IQ and Compustat Global databases. We collected the Standard Industrial Classification (SIC) for each company from Capital IQ⁴. Then we matched each IPO firm with all Compustat Global firms in the same two-digit SIC code. The analysis goes from Year – 1 relative to the completion of IPO through Year + 3⁵ and so we chose only the companies, in each SIC code, that had accounting data for the entire period, i.e. during the five years (-1, 0, +1, +2 and +3) around the IPO year.

The reported significance tests for median changes are based on the Wilcoxon signed-rank test, while the reported significance tests for the differences between the paired sub-samples created are based on the Wilcoxon rank-sum test (Mann-Whitney U-test). Both tests assume that the observations are independent.

⁴ We used the SIC codes because they are the mostly used classification on the empirical literature (e.g. Jain and Kini, 1994). In the case Capital IQ provides more than one SIC code to the same firm we chose the most suitable to the firm according to the business description available in the same database.

⁵ As in Jain and Kini (1994), Year – 1 is the fiscal year before the year during which the firm goes public.

5. Evidence on Operating Performance

5.1. Entire sample

We measure the change in operating performance relative to the fiscal year prior to the IPO (Year - 1). The results for the entire sample are reported in Table II.

Table II: Operating Performance of IPO Companies

Table values represent the median absolute change expressed in percentage for our sample of 555 initial public offerings (IPOs) occurred between 1995 and 2006. Change is operating performance is relative to Year - 1, which is the fiscal year ending prior to IPO completion. Operating return on assets equals EBITDA over total assets at the end of the fiscal year. Operating return on revenues equals EBITDA over total revenues at the end of the year. Operating cash flows are calculated as EBITDA minus capital expenditures. Asset turnover is defined as total revenues over total assets. The industry-adjusted change for a given company is the deviation from the contemporaneous industry median. The significance tests are based on the Wilcoxon signed-rank test, which assumes that the observations are independent.

Measure of Operating Performance	Year Relative to Completion of IPO			
	From - 1 to 0	From - 1 to + 1	From - 1 to + 2	From - 1 to + 3
Panel A: Operating Return on Assets				
Median level in Year - 1 (%):				
IPO sample: 12.76				
Matched industry firms: 9.45				
Median change (%)	-1.35***	-1.92***	-2.83***	-4.67***
Median industry-adjusted change (%)	-1.34***	-1.89***	-2.18***	-3.44***
Number of observations	473	474	451	433
Panel B: Operating Return on Revenues				
Median level in Year - 1 (%):				
IPO sample: 11.41				
Matched industry firms: 9.20				
Median change (%)	0.09	-0.41***	-1.36***	-1.96***
Median industry-adjusted change (%)	-0.21	-0.32***	-0.49**	-1.24***
Number of observations	467	470	447	430

Panel C: Operating Cash Flows/Total Assets				
Median level in Year - 1 (%):				
IPO sample: 7.44				
Matched industry firms: 4.57				
Median change (%)	-1.32***	-2.23***	-2.98***	-3.10***
Median industry-adjusted change (%)	-1.10***	-1.59***	-1.90***	-2.87***
Number of observations	424	424	401	388

Panel D: Operating Cash Flows/Total Revenues				
Median level in Year - 1 (%):				
IPO sample: 6.26				
Matched industry firms: 5.08				
Median change (%)	-0.52***	-1.33***	-2.34***	-2.32***
Median industry-adjusted change (%)	-0.73***	-0.75***	-1.40***	-1.75***
Number of observations	418	419	398	383

Panel E: Capital Expenditures/Total Assets				
Median level in Year - 1 (%):				
IPO sample: 4.15				
Matched industry firms: 3.25				
Median change (%)	-0.10	0.16	-0.05	-0.42***
Median industry-adjusted change (%)	-0.33**	-0.05	-0.46**	-0.35***
Number of observations	425	424	402	388

Panel F: Capital Expenditures/Total Revenues				
Median level in Year - 1 (%):				
IPO sample: 4.09				
Matched industry firms: 3.42				
Median change (%)	0.42***	0.62***	0.13**	-0.21
Median industry-adjusted change (%)	0.35***	0.53***	0.12	-0.08
Number of observations	417	419	397	383

Panel G: Asset Turnover				
Median level in Year - 1:				
IPO sample: 1.04				
Matched industry firms: 0.91				
Median change (%)	-14.89***	-13.63***	-13.86***	-17.37***
Median industry-adjusted change (%)	-13.55***	-10.57***	-12.55***	-13.59***
Number of observations	481	481	459	441

*** Significant at 1% level

** Significant at 5% level

Similarly to the results reported by Jain and Kini (1994), we observe a decline in post-IPO operating performance. We also observe that pre-IPO levels of all these cash flow variables are greater in IPO companies than in matched industry firms, which is consistent with the hypothesis that managers window-dress their accounts before going public.

Panel A documents the median change in operating return on assets. Both individual and industry-adjusted changes are significantly different from zero at the one percent level. The median raw changes in operating return on assets are - 1.35 percent, - 1.92 percent, - 2.83 percent, and - 4.67 percent for years 0, + 1, + 2 and + 3 relative to Year - 1, while the median industry-adjusted changes in operating return on assets are - 1.34 percent, - 1.89 percent, - 2.18 percent and - 3.44 percent for years 0, + 1, + 2, and + 3 relative to Year - 1.

Panel B shows the median change in operating return on revenues. The results show the same trend observed in operating return on assets, but in a smaller magnitude.

Panel C reports the median change in operating cash-flows deflated by assets. Once again, both individual and industry-adjusted changes are significantly different from zero at the one percent level. The median raw changes in operating cash flows over assets are - 1.32 percent, - 2.23 percent, - 2.98 percent and - 3.10 percent for years 0, + 1, + 2 and + 3 relative to Year - 1, while the median industry-adjusted changes in operating cash flows over assets are - 1.10 percent, - 1.59 percent, - 1.90 percent and - 2.87 percent for years 0, + 1, + 2 and + 3 relative to Year - 1.

Panel D indicates the median change in operating cash flows over total revenues. The results show the same trend observed in operating cash flows over total assets, but in a lower extent.

Panel E and Panel F exhibit the median change in capital expenditures over total assets and over revenues, respectively. Contrary to the other variables and as expected, because companies tend to use the proceeds to finance new investments, we find an increase in these measures after IPO. Actually, for the first measure we observe a positive, but statistically insignificant, median change of 0.16 percent in Year + 1 relative to Year - 1. Changes in Years + 2 and + 3 relative to Year - 1 are negative. The median change in capital expenditures over total revenues is positive and significantly

different from zero at one percent level in Years 0 and + 1 relative to Year – 1. These results show companies use at least part of the proceeds to fund capital expenditures. Once spent the proceeds (Year + 1), the ratios decrease in Years + 2 and + 3.

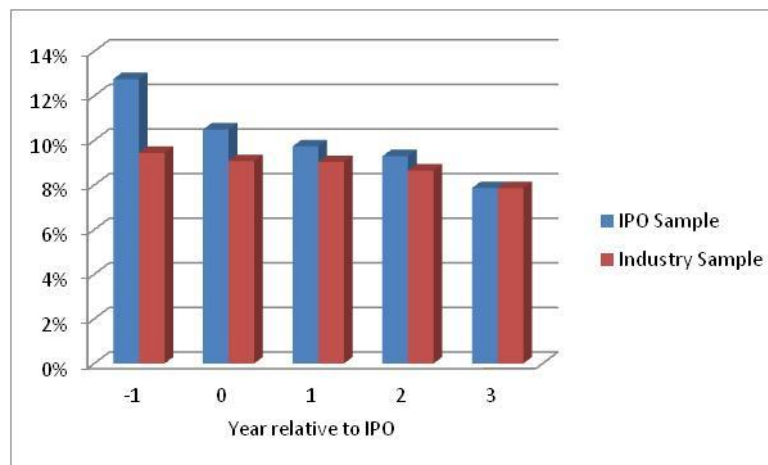
Regarding to Panel G, the median change in asset turnover decreases by 17.37 percent over a four-year window from - 1 to + 3, while over the same period, the median industry-adjusted decline in asset turnover is 13.59 percent. These two values are significant at the one percent level. This mean that IPO firms are less efficient after the IPO than they were before and that only part of this decrease can be explain by industry change.

These results clearly show that IPO firms' operating performance decline after the IPO. However, since cash flow variables are greater in IPO firms than in matched industry firms before the IPO, this significant decrease doesn't mean that IPO firms are less profitable, productive or efficient than industry-firms three years after the IPO.

In order to compare the performance level between IPO firms and industry firms, the actual value of the operating measures before and after the IPO are presented.

Figure 1 shows the median levels of operating return on assets for the IPO sample and their industry counterparts for Years – 1 to + 3 relative to IPO. The numbers graphed are related to those from Panel A of Table II.

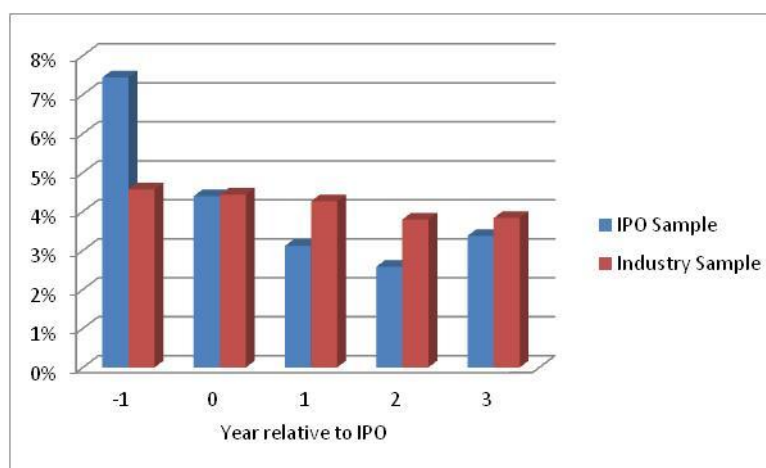
Figure 1: Post-IPO Operating Return on Assets



IPO firms clearly outperform the industry counterparts before the IPO, but the difference between IPO firms and the industry counterparts declines over time as the operating return on assets for the IPO sample declines more after the IPO than the firms in the same industry. Evidence is consistent with the hypothesis that managers attempt to window-dress their accounting numbers in order to make the issue more attractive for the investors.

In Figure 2 are outlined the median levels of operating cash-flows over total assets and it can be seen that although IPO firms outperform industry counterparts in the last year before the IPO, they perform worst than the industry counterparts right after the IPO. According to Jain and Kini (1994), operating cash flows over total assets is an important measure of operating performance because “operating cash flows are a primary component in net present value (NPV) calculations used to value a company”. They say the decline can happen if positive NPV projects have negative earnings early. Because we don’t have information regarding the investment made by the IPO firms after the IPO we can’t conclude if this happens in our case or the decline was just the result of bad investments made or a consequence of the pre-IPO accounting window-dress already mentioned.

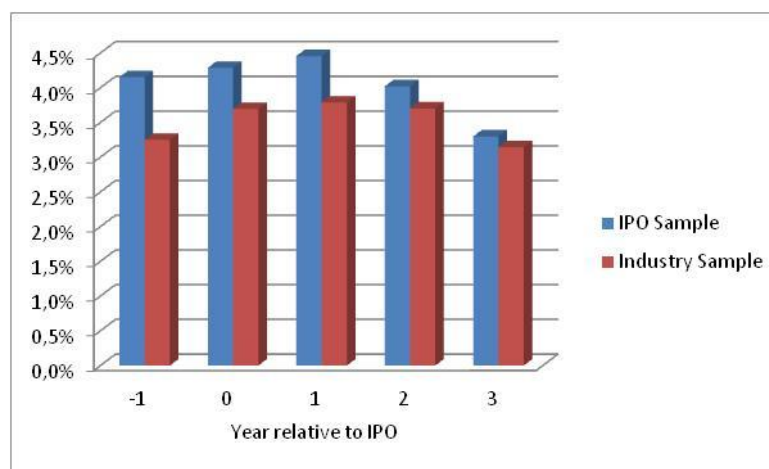
Figure 2: Post-IPO Operating Cash-Flows/Total Assets



Finally, Figure 3 documents the median levels of capital expenditures deflated by total assets. The numbers graphed are related to those reported in Panel E of Table II. We observe that IPO firms invested more than the industry counterparts, before the IPO,

but the difference between both groups tends to decline over the time. Although the IPO firms invest more than the industry counterparts during the entire period, the difference is most significant in the first year after the IPO which suggest IPO firms use the proceeds raised to increase their level of investments. When the effect of the IPO vanishes, the median level of capital expenditures deflated by total assets tend to equalize the median level of the industry counterparts.

Figure 3: Post-IPO Capital Expenditures/Total Assets



5.2. Geographic market and operating performance

Given the structural differences between European developed markets and European emerging markets, we tried to understand if there are differences between these two markets regarding IPO firms' characteristics and post-IPO operating performance. So, we applied Jain and Kini (1994) methodology and split the sample in two sub-samples.

In Table III, we present the summary statistics for these two groups. As expected, IPO issues in European developed countries are larger than the ones in the European Emerging Markets.

The results also show that IPOs are more underpriced in European emerging countries than in European developed countries. These differences are statistically significant. Original investors in IPO issues in European emerging countries retain a higher proportion of shares and firms involved are older at the time of the IPO. However, the differences to the IPOs occurred in European developed countries are not statistically significant.

IPO firms in European emerging countries exhibit higher levels of operating performance before the IPO than firms in European developed countries. The differences between both groups on all operating performance measures are statistically significant.

Table IV reports the post-IPO operating performance of European developed countries and European emerging countries. The post-IPO operating performance is measured using the same cash-flow variables and is relative to the last fiscal year prior to the IPO (Year - 1), as before.

Panel A of Table IV shows the median changes in operating return on assets in European developed countries and European emerging countries during a four-year window, from - 1 to + 3. Both groups exhibit a decline in this operating measure, however, the decline is greater for European emerging countries (those which present the higher pre-IPO levels), however the differences are not statistically significant.

Table III: Summary Statistics of the IPO Sample Split by Geographic Market

Size of issue represents the gross proceeds raised at IPO. Initial return is the first-day closing price minus the offering price as a proportion of the offering price. Alpha is the fraction of equity retained by the original owners of the company after the IPO. Alpha is the difference between the number of shares outstanding after IPO and the number of shares offered as a percentage of the number of shares outstanding after IPO. As in Jain and Kini (1994), it is computed under the assumption that the overallotment options, if any, are not exercised. Age is the age of the company at the time of the IPO and is defined as year of the IPO minus year of incorporation. Operating return on assets equals EBITDA over total assets at the end of the fiscal year. Operating cash flows are calculated as EBITDA minus capital expenditures. Asset turnover is defined as total revenues over total assets. Year – 1 is the fiscal year ending prior to IPO completion. Number of observations is in parenthesis in the geographic market columns. Significance levels of median differences (U-Statistic column) are based on a two-sample Wilcoxon rank-sum test (Mann-Whitney U-test), which assumes that the observations are independent.

Variable	European Developed Markets (EDM)	European Emerging Markets (EEM)	U-Statistic (p-value)
Median size of issue (\$ million)	59.52 (461)	17.70 (90)	3.98*** (0.000)
Median initial return (%)	2.73 (419)	5.22 (81)	2.12** (0.034)
Median alpha (%)	70.54 (425)	72.73 (85)	0.364 (0.716) 0.436 (0.663)
Median age (years)	11 (440)	14 (90)	0.663 3.04*** (0.002)
Median operating return on assets (Year - 1) (%)	11.89 (405)	15.18 (75)	3.04*** (0.002)
Median operating cash flows over total assets (Year -1) (%)	7.28 (374)	9.23 (74)	1.72* (0.085)
Median capital expenditures over total assets (Year -1) (%)	3.88 (374)	6.90 (74)	3.07*** (0.002)
Median asset turnover (Year-1) (%)	1.02 (406)	1.46 (83)	3.13*** (0.002)

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

For operating cash flows over total assets variable (Panel B of Table IV) the trend is the same: declines in European emerging countries for this operating performance measure are bigger. Nevertheless, and contrary to what happens in operating return on assets, differences between the two groups are statistically significant for the median change in Year + 1 and Year +2, relative to Year – 1.

Panel C documents the median changes in capital expenditures over total assets for the two groups of firms. IPO firms in European emerging countries increase their investment, not only on the first year after the IPO like the IPO firms in European

Table IV: Operating Performance of the IPO Sample Split by Geographic Market

Table values represent the median absolute change expressed in percentage for our sample of 555 initial public offerings (IPOs) occurred between 1995 and 2006. EDM are European Developed Markets and EEM are European Emerging Markets. Change in operating performance is relative to Year – 1, which is the fiscal year ending prior to IPO completion. Operating return on assets equals EBITDA over total assets at the end of the fiscal year. Operating cash flows are calculated as EBITDA minus capital expenditures. Asset turnover is defined as total revenues over total assets. The industry-adjusted change for a given company is the deviation from the contemporaneous industry median. Significance tests for median changes are based on the Wilcoxon signed-rank test, while significance levels of median differences (U-Statistic column) are based on a two-sample Wilcoxon rank-sum test (Mann-Whitney U-test), which assumes that the observations are independent.

Measure of Operating Performance	Year Relative to Completion of IPO											
	- 1 to 0			- 1 to + 1			-1 to + 2			-1 to + 3		
	EDM	EEM	U-Statistic (p-value)	EDM	EEM	U-Statistic (p-value)	EDM	EEM	U-Statistic (p-value)	EDM	EEM	U-Statistic (p-value)
Panel A: Operating Return on Assets												
Median change (%)	-1.25***	-2.18***	0.54 (0.589)	-1.65***	-2.76***	0.79 (0.427)	-2.45***	-3.21***	0.04 (0.967)	-4.18***	-5.77***	0.77 (0.440)
Median industry-adjusted change (%)	-1.16***	-2.36**	0.43 (0.664)	-1.26***	-2.88***	0.59 (0.553)	-1.99***	-2.33**	0.08 (0.935)	-3.12***	-4.68***	0.73 (0.468)
Number of observations	398	75		399	75		378	73		362	71	
Panel B: Operating Cash Flows/Total Assets												
Median change (%)	-0.96***	-2.71**	0.91 (0.363)	-1.43***	-5.73***	2.18** (0.029)	-2.29***	-6.51***	1.84* (0.065)	-2.59***	-6.50***	1.15 (0.252)
Median industry-adjusted change (%)	-0.60**	-2.78*	0.88 (0.380)	-0.94***	-4.56***	1.92* (0.055)	-1.46**	-4.15***	1.70* (0.089)	-2.25***	-4.03***	1.01 (0.313)
Number of observations	351	74		350	74		330	72		318	70	
Panel C: Capital Expenditures/Total Assets												
Median change (%)	-0.10	-0.11	0.59 (0.557)	0.03	1.70***	3.10*** (0.002)	-0.33***	2.12***	4.34*** (0.000)	-0.51***	-0.15	0.92 (0.358)
Median industry-adjusted change (%)	-0.36**	-0.05	0.82 (0.410)	-0.25	1.23*	2.42** (0.016)	-0.62***	1.50***	4.24*** (0.000)	-0.42***	-0.13	0.44 (0.661)
Number of observations	351	74		350	74		330	72		318	70	
Panel D: Asset Turnover												
Median change (%)	-14.22***	-20.72***	1.66* (0.096)	-11.34***	-21.03***	2.66*** (0.008)	-11.25***	-32.12***	3.00*** (0.003)	-12.88***	-36.04***	2.80*** (0.005)
Median industry-adjusted change (%)	-12.50***	-16.85***	1.30 (0.195)	-9.77***	-17.64***	2.27** (0.023)	-9.78***	-36.35***	2.96*** (0.003)	-10.64***	-29.15***	2.20** (0.028)
Number of observations	399	82		399	82		379	80		363	78	

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

developed countries, but during the first two years after the IPO. Even in the first year after the IPO the capital expenditures increase is much more significant in European emerging countries than in European developed countries

Finally, Panel D reports the median changes in asset turnover for the two groups. IPO firms in European emerging countries face a higher decrease after the IPO than the IPO firms in European developed countries. Moreover, all the differences are statistically significant at, at least, ten percent level with the exception in median industry-adjusted change in Year 0 relative to Year – 1.

In conclusion, there are some relevant differences between European developed countries and European emerging markets regarding IPO firms' characteristics statistics and post-IPO operating performance. IPO firms from European emerging markets tend to invest more and for a longer period after the IPO than IPO firms from European developed markets. IPO firms from European emerging markets tend also to present better operating performance measures before the IPO but then to perform much worse than IPO firms from European developed markets. This behavior is consistent with the hypothesis that managers attempt to window-dress accounting numbers even more in emerging countries as higher pre-IPO levels lead to worse post-IPO operating performance

5.3. Ownership and operating performance

Transition from private to public ownership could eventually bring increased agency costs. As documented by Jensen and Meckling (1976), agency costs are inherent to publicly held business corporations. It is expected that companies with higher ownership retained, and, therefore, with low agency costs, perform better. Nevertheless, Mikkelsen et al. (1997) findings show that changes in equity ownership after IPO don't lead to changes in operating performance of the firms.

As in Jain and Kini (1994), we split the IPO sample by the median proportion of the firm retained after IPO (α). Table V shows the summary statistics for the sample of IPOs split by median α . Issue size of low ownership ($\alpha \leq 71.06$) IPO firms is

larger than issue size of high ownership ($\alpha > 71.06$) IPO firms (median issue size equal to \$90.3 million against \$22.35 million). The difference is significant at the one percent level. However, both groups of firms present similar levels of operating performance in the year before the IPO.

Table V: Summary Statistics of the IPO Sample Split by Median Alpha

Size of issue represents the gross proceeds raised at IPO. Initial return is the first-day closing price minus the offering price as a proportion of the offering price. Alpha is the fraction of equity retained by the original owners of the company after the IPO. Alpha is the difference between the number of shares outstanding after IPO and the number of shares offered as a percentage of the number of shares outstanding after IPO. As in Jain and Kini (1994), it is computed under the assumption that the overallocation options, if any, are not exercised. Age is the age of the company at the time of the IPO and is defined as year of the IPO minus year of incorporation. Operating return on assets equals EBITDA over total assets at the end of the fiscal year. Operating cash flows are calculated as EBITDA minus capital expenditures. Asset turnover is defined as total revenues over total assets. Year - 1 is the fiscal year ending prior to IPO completion. Number of observations is in parenthesis in the $\alpha > 71.06$ and $\alpha \leq 71.06$ columns. Significance levels of median differences (U-Statistic column) are based on a two-sample Wilcoxon rank-sum test (Mann-Whitney U-test), which assumes that the observations are independent.

Variable	Alpha > 71.06	Alpha \leq 71.06	U-Statistic (p- value)
Median size of issue (\$ million)	22.35 (254)	90.28 (253)	5.99*** (0.000)
Median initial return (%)	3.43 (240)	3.16 (242)	0.40 (0.687)
Median alpha (%)	80.07 (255)	58.97 (255)	19.54*** (0.000)
Median age (years)	10 (247)	13 (245)	1.82* (0.069)
Median operating return on assets (Year - 1) (%)	12.83 (234)	12.57 (235)	0.53 (0.595)
Median operating cash flows over total assets (Year - 1) (%)	7.22 (212)	7.49 (226)	0.05 (0.962)
Median capital expenditures over total assets (Year - 1) (%)	4.30 (212)	3.68 (226)	1.03 (0.303)
Median asset turnover (Year-1) (%)	1.04 (241)	1.03 (236)	0.28 (0.781)

*** Significant at 1% level

* Significant at 10% level

Table VI presents post-IPO operating performance in high and low ownership firms. In contrast to Jain and Kini (1994), high ownership firms perform worse than low ownership firms. This result is not consistent with the fact that low ownership implies higher agency cost due to a large separation between managers and owners. However,

Table VI: Operating Performance of the IPO Sample Split by Median Alpha

Table values represent the median absolute change expressed in percentage for our sample of 555 initial public offerings (IPOs) occurred between 1995 and 2006. Change in operating performance is relative to Year – 1, which is the fiscal year ending prior to IPO completion. Operating return on assets equals EBITDA over total assets at the end of the fiscal year. Operating cash flows are calculated as EBITDA minus capital expenditures. Asset turnover is defined as total revenues over total assets. The industry-adjusted change for a given company is the deviation from the contemporaneous industry median. Significance tests for median changes are based on the Wilcoxon signed-rank test, while significance levels of median differences (U-Statistic column) are based on a two-sample Wilcoxon rank-sum test (Mann-Whitney U-test), which assumes that the observations are independent.

Measure of Operating Performance	Year Relative to Completion of IPO											
	- 1 to 0			- 1 to + 1			-1 to + 2			-1 to + 3		
	Alpha ≤ 71.06%	Alpha > 71.06%	U-Statistic (p-value)	Alpha ≤ 71.06%	Alpha > 71.06%	U-Statistic (p-value)	Alpha ≤ 71.06%	Alpha > 71.06%	U-Statistic (p-value)	Alpha ≤ 71.06%	Alpha > 71.06%	U-Statistic (p-value)
Panel A: Operating Return on Assets												
Median change (%)	-0.63	-2.09***	2.05** (0.041)	-0.84	-3.17***	1.31 (0.190)	-1.84***	-3.80***	1.20 (0.230)	-3.26***	-5.17***	1.17 (0.242)
Median industry-adjusted change (%)	-0.92**	-2.49***	1.86* (0.063)	-1.19*	-2.88**	1.08 (0.279)	-0.97	-2.67***	1.08 (0.278)	-2.18**	-3.57***	1.17 (0.241)
Number of observations	234	230		234	231		224	218		219	205	
Panel B: Operating Cash Flows/Total Assets												
Median change (%)	-0.81	-2.43***	1.72* (0.085)	-0.75	-3.36***	1.88* (0.061)	-1.98**	-4.48***	1.31 (0.192)	-2.38***	-3.70***	0.57 (0.570)
Median industry-adjusted change (%)	-0.12	-2.32**	1.82* (0.068)	-0.32	-3.62***	1.66* (0.098)	-0.63	-3.30**	1.32 (0.187)	-1.54	-3.77***	0.85 (0.394)
Number of observations	219	199		221	196		212	184		208	174	
Panel C: Capital Expenditures/Total Assets												
Median change (%)	-0.09	-0.10	0.16 (0.874)	0.06	0.42**	1.06 (0.289)	-0.06	0.14	0.82 (0.412)	-0.55***	-0.23*	0.41 (0.685)
Median industry-adjusted change (%)	-0.33*	-0.26	0.14 (0.889)	-0.25	0.16	1.10 (0.270)	-0.55**	-0.25	0.95 (0.341)	-0.33**	-0.27	0.19 (0.849)
Number of observations	219	199		221	196		212	184		208	174	
Panel D: Asset Turnover												
Median change (%)	-10.94***	-17.88***	2.22** (0.026)	-5.36**	-18.28***	2.49** (0.013)	-4.43	-19.10***	2.68*** (0.007)	-11.41***	-23.15***	2.01** (0.045)
Median industry-adjusted change (%)	-10.27***	-16.07***	2.12** (0.033)	-4.59**	-17.55***	2.70*** (0.007)	-4.87*	-20.64***	2.77*** (0.006)	-8.76***	-18.39***	2.19** (0.028)
Number of observations	235	237		235	237		225	225		220	212	

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

the post-IPO operating performance difference between both groups of firms is only significant in the first year after the IPO (with the exception of the median difference on asset turnover).

Brau and Fawcett (2006) find large old companies are less likely to go public and avoid ownership dilution because there is a desire to maintain decision-making control. This original owners' entrenchment could lead to a worse performance of high ownership firms, in line with our results. Wruck (1989) also find that between certain ranges of equity ownership, the ability of initial owners to become entrenched leads to a worst performance.

Table VI also shows that high ownership firms invest more than low ownership firms in the first two years after the IPO but the differences are not statistically significant.

5.4. Underpricing and operating performance

The underpricing is a widely discussed theme in the IPO literature throughout the years. Some authors (e.g. Welch, 1989) suggest that underpricing, in a context of asymmetric information, is a way of signaling the quality of the new issues, while others (e.g Ritter and Welch, 2002) believe that underpricing have behavioral and agency theory explanations and it is not related with asymmetric information.

If the signaling models are correct, we expect the high underpriced group performs better after the IPO. To test this prediction, we split the sample by median underpricing and the results are presented in Table VII and Table VIII.

Table VII: Summary Statistics of the IPO Sample Split by Median Underpricing

Size of issue represents the gross proceeds raised at IPO. Initial return is the first-day closing price minus the offering price as a proportion of the offering price. Alpha is the fraction of equity retained by the original owners of the company after the IPO. Alpha is the difference between the number of shares outstanding after IPO and the number of shares offered as a percentage of the number of shares outstanding after IPO. As in Jain and Kini (1994), it is computed under the assumption that the overallotment options, if any, are not exercised. Age is the age of the company at the time of the IPO and is defined as year of the IPO minus year of incorporation. Operating return on assets equals EBITDA over total assets at the end of the fiscal year. Operating cash flows are calculated as EBITDA minus capital expenditures. Asset turnover is defined as total revenues over total assets. Year - 1 is the fiscal year ending prior to IPO completion. Number of observations is in parenthesis in the Underpricing > 3.05 and Underpricing ≤ 3.05 columns. Significance levels of median differences (U-Statistic column) are based on a two-sample Wilcoxon rank-sum test (Mann-Whitney U-test), which assumes that the observations are independent.

Variable	Underpricing > 3.05	Underpricing ≤ 3.05	U-Statistic (p-value)
Median size of issue (\$ million)	50.85 (250)	47.32 (250)	0.19 (0.853)
Median initial return (%)	11.46 (250)	-0.45 (250)	19.35*** (0.000)
Median alpha (%)	71.08 (245)	70.59 (237)	0.13 (0.900)
Median age (years)	11 (246)	12 (240)	0.91 (0.363)
Median operating return on assets (Year - 1) (%)	12.98 (224)	11.88 (226)	0.64 (0.521)
Median operating cash flows over total assets (Year -1) (%)	7.89 (215)	7.39 (207)	0.53 (0.599)
Median capital expenditures over total assets (Year -1) (%)	4.40 (215)	3.64 (207)	1.10 (0.271)
Median asset turnover (Year-1) (%)	1.05 (234)	1.04 (226)	0.81 (0.417)

*** Significant at 1% level

Table VII shows the difference between above-median underpricing group and below-median underpricing group in the year before the IPO is not significant.

Table VIII presents the post-issue operating performance for both groups of firms (the above-median underpricing group and the below-median underpricing group). Median change in operating returns on assets (Panel A) declines more in below-median underpricing group, which suggests less underpriced firms perform worse than high underpriced ones, which is consistent with the signaling hypothesis. However, differences in median changes between the two groups are not significant.

Regarding operating cash flows over total assets (Panel B), the trend is similar. If we look to raw median changes, we find that the below-median underpricing group has faced a higher decline than the above-median underpricing group in Year + 2 and Year +3 relative to Year – 1, while if we take into account median industry-adjusted changes, below-median underpricing group has faced a higher decline in Year + 1 (relative to Year – 1) as well. However, none of these differences is significant.

Panel C shows median changes in capital expenditures for both groups of firms and Panel D documents the median changes in asset turnover. The measures are inconclusive and none of the differences is statistically significant.

In conclusion, underpricing seems to have a low explanatory power in post-IPO operating performance. All the differences in median changes between the two groups are insignificant and so our results are not consistent with the signaling hypothesis of underpricing.

Table VIII: Operating Performance of the IPO Sample Split by Median Underpricing

Table values represent the median absolute change expressed in percentage for our sample of 555 initial public offerings (IPOs) occurred between 1995 and 2006. Change in operating performance is relative to Year – 1, which is the fiscal year ending prior to IPO completion. Operating return on assets equals EBITDA over total assets at the end of the fiscal year. Operating cash flows are calculated as EBITDA minus capital expenditures. Asset turnover is defined as total revenues over total assets. The industry-adjusted change for a given company is the deviation from the contemporaneous industry median. Significance tests for median changes are based on the Wilcoxon signed-rank test, while significance levels of median differences (U-Statistic column) are based on a two-sample Wilcoxon rank-sum test (Mann-Whitney U-test), which assumes that the observations are independent.

Measure of Operating Performance	Year Relative to Completion of IPO											
	- 1 to 0		- 1 to + 1			-1 to + 2			-1 to + 3		U-Statistic (p-value)	
	Underpricing ≤ 3.05%	Underpricing > 3.05%	U-Statistic (p-value)	Underpricing ≤ 3.05%	Underpricing > 3.05%	U-Statistic (p-value)	Underpricing ≤ 3.05%	Underpricing > 3.05%	U-Statistic (p-value)	Underpricing ≤ 3.05%		Underpricing > 3.05%
Panel A: Operating Return on Assets												
Median change (%)	-1.84**	-1.28**	0.92 (0.356)	-2.05***	-1.48	0.50 (0.621)	-2.84***	-2.44***	0.23 (0.817)	-5.48***	-3.84***	0.79 (0.430)
Median industry-adjusted change (%)	-1.82***	-1.15*	1.13 (0.258)	-1.92***	-1.13	0.96 (0.337)	-2.54***	-1.75*	0.67 (0.505)	-4.31***	-2.18***	0.86 (0.391)
Number of observations	224	220		223	222		213	210		210	197	
Panel B: Operating Cash Flows/Total Assets												
Median change (%)	-1.19**	-1.82**	1.01 (0.312)	-2.22***	-2.29***	0.47 (0.641)	-3.24***	-2.41***	0.38 (0.703)	-3.78***	-2.40***	1.08 (0.282)
Median industry-adjusted change (%)	-1.06	-1.42	1.06 (0.290)	-2.38**	-1.35	0.61 (0.540)	-2.47**	-1.30	0.54 (0.587)	-3.23***	-2.99*	0.74 (0.460)
Number of observations	197	203		196	203		189	190		186	181	
Panel C: Capital Expenditures/Total Assets												
Median change (%)	-0.10	-0.09	0.53 (0.599)	0.23	0.09	0.20 (0.844)	0.09	-0.16	0.93 (0.352)	-0.33***	-0.36**	0.46 (0.643)
Median industry-adjusted change (%)	-0.31	-0.22	0.40 (0.691)	-0.05	-0.04	0.29 (0.772)	-0.42	-0.42	0.66 (0.510)	-0.30**	-0.28	0.11 (0.914)
Number of observations	197	203		196	203		189	190		186	181	
Panel D: Asset Turnover												
Median change (%)	-14.22***	-15.36***	0.05 (0.961)	-13.17***	-11.37***	0.60 (0.547)	-12.45***	-13.59***	0.46 (0.644)	-16.88***	-18.66***	0.63 (0.531)
Median industry-adjusted change (%)	-14.29***	-13.55***	0.23 (0.820)	-12.29***	-9.04***	0.90 (0.368)	-12.64***	-12.13***	0.11 (0.913)	-12.04***	-13.39***	0.28 (0.781)
Number of observations	223	231		223	231		213	220		211	206	

*** Significant at 1% level

** Significant at 5% level

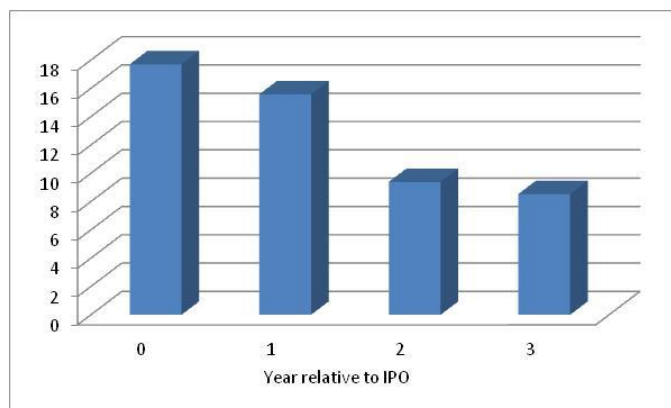
* Significant at 10% level

6. Post-IPO earnings performance, market expectations and capital structure

Similarly to Jain and Kini (1994), we observe two measures of investors expectations of post-IPO earnings growth, market-to-book (M-t-B) ratio and price-earnings (P/E) ratio in order to know if pre-IPO investors expectations are fulfilled.

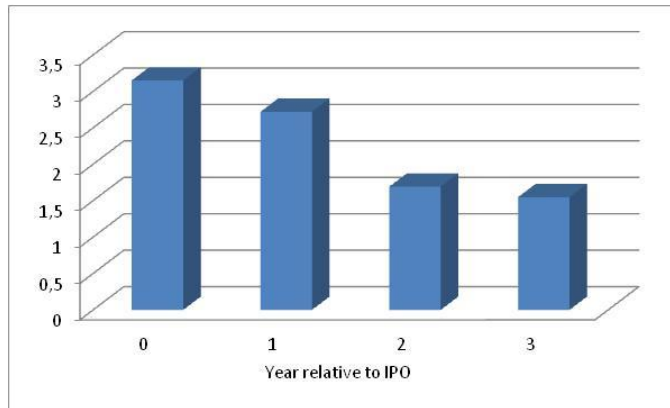
Figure 4 shows the median level of price-earnings ratio (P/E) for the IPO sample. P/E ratio is calculated as the stock price divided by earnings per share (EPS). According to market timing hypothesis, companies go public when market conditions are unusually good, in levels that can't be sustained in the future. As we can see P/E declines after IPO which suggests investors expectations and overoptimism are not sustained.

Figure 4: Post-IPO Price/Earnings Ratio



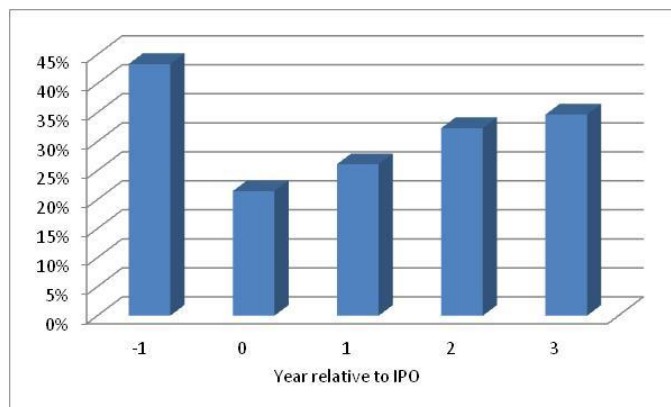
In Figure 5, we observe the median level of market-to-book ratio of equity for the IPO sample. The M-t-B ratio of equity is defined as the ratio of market value of equity to the book value of equity. Figure 5 confirms the conclusions of Figure 4. M-t-B ratio falls from about 3 to 1.5 in three years, which reveals growth expectations were overestimated.

Figure 5: Post-IPO Market-to-Book of Equity



Moreover, we go further and try to understand if IPOs influence the capital structure of firms. Figure 6 exhibits the post-IPO median level of total debt/capital for the IPO sample. Total debt/capital is computed as total debt divided by total debt plus total equity. Alti (2006) addresses the question and concludes IPO firms exhibit a decrease in their leverage ratios in the IPO year. However, he continues, this decline is brief and, immediately following the IPO, firms increase their leverage ratios by issuing more debt. Two years after the IPO, the impact of market timing in leverage disappears, he concludes. Figure 6 documents the median level of total debt/capital for the entire sample of IPO firms and the observed trend is consistent with Alti (2006) conclusions. Indeed, in the last year before the IPO, median total debt/capital, expressed in percentage, is almost 45 percent. In the IPO year, median total debt/capital significantly fall for about 20 percent. However, in the years after the IPO completion, the median ratio starts to increase and reaches almost 35% in Year + 3.

Figure 6: Post-IPO Total Debt/Capital



7. Conclusions

Although there are many papers studying the post-IPO stock performance, there are few papers studying the post-IPO operating performance. We tried to fill this gap with this study in which we present evidence on the post-IPO operating performance of European IPOs. Our results show that European IPO firms exhibit a decline in post-IPO operating performance, which is consistent with previous studies of U. S. IPO firms (e.g. Jain and Kini, 1994). Jain and Kini (1994) report three possible explanations for the post-IPO operating performance decline: higher agency costs due to the transition from private to public ownership, window-dress accounting figures by managers before the IPO and market timing hypothesis.

Our evidence is consistent with the last two explanations. Pre-IPO levels of cash-flows variables are systematically higher than post-IPO levels, which could suggest the window-dressing of accounting numbers. On the other hand, individual market-to-book ratios and price-earnings ratios decrease considerably after the IPO which suggest that managers time the new issues, trying to benefit from good stock market conditions.

We measured operating performance from Year – 1 to Year + 3 relative to the IPO completion by using several ratios such as the operating returns (EBITDA) on assets or the operating cash flows (EBITDA-CAPEX) over assets, following a well established methodology which primarily focus in Jain and Kini (1994) work, but with roots in Kaplan (1989).

Our sample includes 555 European IPOs occurred between 1995 and 2006. The majority of those IPOs occurred in 2005 and 2006, suggesting the existence of an IPO wave. We also observe an industry clustering in IPO activity, as suggested by Jain and Kini (2006). There's a prevalence of Information Technology companies in those companies that went public during those years. The mean (median) size of issue was about 255 million dollars (45 million dollars) while the mean (median) fraction of equity retained by initial owners was about 68 percent (71 percent). Finally, average (median) age of IPO companies is around 26 years (12 years), a high value when we

consider U. S. IPOs, but a low value in Europe in comparison to the results achieved by Pagano et al. (1998) or Huyghebaert and Hulle (2006).

In order to test some hypothesis discussed in the literature our sample was split in several sub-samples based in different criteria.

First we split the sample by geographic market, which is the main innovation of our work. We split our sample between European developed countries and European emerging countries and our results show that firms' post-issue operating performance of IPOs occurred in European emerging countries is worse than those of firms that went public in European developed countries. We found significant differences between the two groups on operating cash flows, capital expenditures and asset turnover variables. Hence, we can conclude that there is in fact a Berlin wall in post-issue operating performance of the firms.

Why this happens, it's difficult to know and our conclusion could be bias by the fact that the majority of IPOs occurred in European emerging countries took place in just one country, Poland. Indeed, the Polish IPO market, the most representative of Eastern Europe, is a very dynamic IPO market and, therefore, can be affected by investors' overoptimism. On the other hand, pre-IPO levels of cash flow measures are higher in European emerging countries than in European developed countries and the post-IPO performance decline is greater which can suggest that firms' managers window-dress accounting figures before going public, trying to take advantage of a new, maybe inexperience class of IPO investors.

Second, we split the sample by median proportion of the firm retained by original owners after the IPO (α) to test the increased agency costs hypothesis. We find that firms in which original investors retain less equity didn't decline so much as the others, which contrasts to Jain and Kini (1994) findings and suggest that the increased agency costs are not relevant for the post-issue operating performance. This results are however consistent with the managerial entrenchment hypothesis (Wruck, 1989, Brau and Fawcett, 2006). Firms in which there is a managerial entrenchment or those in which managers retain more equity could be less permeable to technological change and innovation, what explains the poor post-IPO performance.

Then, we split the sample by median underpricing, trying to test the signaling hypothesis of underpricing. Our results find that although high underpriced issues didn't perform so badly as low underpriced issues the difference is not significant, which suggest that underpricing has a very low explanatory power in post-issue operating performance, contrary to the predictions of the signaling hypothesis of underpricing.

Finally, regarding post-IPO earnings growth and market expectations, we observed a decrease in price-earnings and market-to-book ratios for the IPO sample. This finding suggests that European companies explore windows of opportunity, going public in the presence of favorable market conditions and benefiting for overestimated valuations. We also find the going public decision has a residual impact in the long-term capital structure of the IPO firms. Although there is a relevant reduction of total debt/capital ratio in the first year after the IPO, this effect disappears during the first three years after the IPO.

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