Grandstanding and Spinning in VC-Backed IPOs on AIM UK

Alberto Dell'Acqua

Antonio Guardasole

Stefano Bonini

Department of Finance

Bocconi University

Via Rontgen, 1 – 20131 Milan (Italy)

Phone #: +39.02.5836.6815 – Fax #: +39.02.5836.6993

Corresponding author: alberto.dellacqua@sdabocconi.it

This version: 16 July 2012

Abstract

We study a hand-collected dataset that includes 507 IPOs on the UK Alternative Investment Market (AIM) from FY 2004 to FY 2010. IPOs backed by venture capitalists registered an average underpricing of 25.8%; almost double that of non-venture-backed IPOs (14.6%). We test for the presence of grandstanding and spinning phenomena through OLS regressions and provide new empirical evidence that venture capitalists (VCs) *do* grandstand firms and strike *quid pro quo* agreements with underwriters, thus increasing the level of underpricing. The grandstanding and spinning hypotheses also hold when controlling for IPO year and industry effects.

1. Introduction

We conduct an empirical test on a hand-collected dataset that includes 507 UK IPOs on the London Stock Exchange Alternative Investment Market (AIM) from FY 2004 to FY 2010 and address the relationship between venture funds and IPO underpricing. The sample was divided into two pools: the first (99 observations) containing venture-capital-backed IPOs (VC-Backed IPOs), the second (408 observations) non-venture-capital-backed IPOs (non-VC-backed IPOs). The descriptive analysis immediately demonstrates that venture-capital-backed issues are on average more underpriced (25.8% VC-Backed vs. 14.6% non-VC-backed). Using OLS regressions with IPO underpricing as the main dependent variable and grandstanding and spinning proxies as the main explanatory variables, we find evidence that grandstanding and spinning hypotheses *do* explain IPO underpricing. This evidence holds when controlling for year and industry effects. We also provide some time-related insights, dividing the timeframe between the pre-crisis (2004-2007) and post-crisis periods (2008-2010).

We contribute to existing literature in several ways. First, the focus on AIM allows investigating our hypotheses on a market specifically conceived as an exit for VCs and, more importantly, with a much larger degree of variation in terms of investors as well as the countries and sectors of listed companies.[1] As such, this marginally exploited market provides fertile testing ground for the grandstanding and spinning hypotheses with only limited data snooping issues. Secondly, the rules of UK markets, and AIM in particular, have not yet embodied an "Anti-Spinning" rule such as Rule 5131 introduced by FINRA and SEC in the US. Third, in excluding the dotcom bubble period we specifically test the grandstanding and spinning theories in a more general form and establish whether this VC behavior is specific to a unique environment, such as the Internet bubble, or is a structural bias in investment and exit processes. Finally, we extend our analysis to the crisis period and provide further insights on the exit decision process of investors in both favorable and unfavorable market conditions.

---

[1] The London Stock Exchange website defines the AIM Market as "London Stock Exchange's international market for smaller growing companies (where)… a wide range of businesses including early stage, venture capital backed as well as more established companies join (it) seeking access to growth capital". Since its establishment in 1995, more than 3,000 companies joined AIM from across the globe. At the end of 2011, a total of 1,143 companies were listed, 225 of which were non-UK.

2. Literature review

Do venture capitalists increase or decrease the average IPO underpricing? This question has been amongst the most debated by scholars studying the relationship between listing firms and venture capitalists. A first group of theories claims that venture capitalists assume a certification role through monitoring activities on behalf of managed firms. VCs are subsequently assumed to reduce asymmetric information and thus underpricing, as confirmed by Barry et al (1990), who state that the certification role and complementary monitoring activity would be seen as the main causes of decreasing investor uncertainty. Supporting evidence is offered by Megginson and Weiss (1991), who affirm that VCs are able to certify that the offer price reflects all private information so that the initial share price is equivalent to the intrinsic fair value of shares, excluding mispricing issues. Megginson and Weiss (1991) also argue that VC-backed companies attract prestigious underwriters, which should reduce underpricing and thus decrease the cost of going public, as also confirmed by Carter and Manaster (1991). Since the authors find that usually VCs are major shareholders, retaining a large part of their shares at the IPO would easily ensure their certification role. Moreover, VCs are able to take companies to market earlier (Megginson and Weiss, 1991). As demonstrated by Sahlman (1990), retaining a portion of their holdings grants VCs credibility in their certification role. Selling their entire holding at the IPO date may be perceived as a negative signal by the market, which may reconsider the reputation level assigned to the fund. In addition, since it can be costly for issuers to purchase the certifier's reputational capital, the authors, focusing on high-tech businesses, assert that VCs are the most suitable source of financing for young and rapidly growing companies. The importance of the certification role is also underlined by Chahine et al (2006), who claim that on average VC-backed-IPOs in the UK are less underpriced than non-VC-backed-IPOs. Lin and Smith (1995) and Neus and Walz (2004) offer some studies on the reputation issue. Lin and Smith assert that venture capitalists are perceived as insiders and a substantial sale of shares at the IPO would therefore be perceived by the market as a negative signal. In fact, since VCs generally maintain part of their position beyond the IPO, selling the majority or their entire stake would lead outsiders to consider the new issue as overpriced. The empirical analyses conducted by the authors confirm that VCs are aware that maintaining their positions at the IPO serves as proof to underwriters and the market that they are not acting opportunistically. Neus and Walz's (2004) contribution demonstrates that venture capital funds face a trade-off: although fund reputation is a key determinant to obtaining future financing, postponing the exit time will lead to VCs loosing many investment opportunities. Since VC funds have a limited life span, requiring rates of return up to 50% (Sahlman, 1990), a high *share overhang*

(calculated as shares retained/shares issued) could be associated with high six-month underpricing, which could constitute future compensation for venture capitalists on final exit.

This comment leads us to the second school of thought on VCs and underpricing. The main findings, with a number of different explanations, conversely indicate that VCs increase underpricing. Bradley and Jordan (2002) provide a particular interpretation, finding that VC-backed IPOs are more underpriced than non-VC-backed IPOs. They find no evidence on the VC certification role and agree with several other studies that hot issue periods are usually more underpriced than others are. A first issue to be discussed is whether VCs take more companies public during high market peaks (Lerner, 1994), and if this is the case, what the main explanation are. As stated by Gompers et al (2005), since VCs are very successful during hot issue periods, it can be assumed that VCs underprice more during bubble periods. In fact, investors are incentivized to acquire what they perceive to be quality securities, generating what is generally called a "cascade effect". This latter consideration is supported by Bessler and Seim (2011), who recently conducted research on underpricing of VC-backed IPOs in Europe. Testing their assumptions on a sample of European IPOs, they find that the underpricing level, especially for venture capital backed IPOs, is higher during hot issue periods, such as the dotcom bubble and pre-financial crisis periods. However, the authors show that the underpricing experienced by European markets during the 1998-2000 period is much higher than the level observed during the 2003-2007 period. Further support is provided by Oehler et al (2004), who argue that in certain periods underpricing is not in fact due to ex-ante uncertainty but to investor sentiment and demand. They empirically prove their hypothesis using a sample based on German IPOs.

The main explanation of higher underpricing for VC-backed IPOs is attributed to the well known *grandstanding theory* (Gompers, 1996) and *spinning hypothesis* (Loughran and Ritter, 2004). Gompers (1996) states that underpricing is a natural consequence of the greater risk perceived by the market when venture capital funds take very young companies public, since these are still very risky due to their lifecycle phase. In view of the fact that in the early years of their existence companies are unable to support their operations with internal resources, they require strong partnerships with reliable source of financing that can lead them towards the second phase of their lifecycle. When the grandstanding theory holds, VCs act opportunistically, looking for a quick exit in order to cash out and seize other opportunities. The dynamics and implications of grandstanding will be discussed in detail in the next section.

The second main reason, attributed to Loughran and Ritter (2004), implies an agreement between IPO decision-makers and the bank sponsoring the IPO. Underwriters may find it convenient to underprice shares, principally to provide clients with greater initial returns, which

increases their reputation and renders their services much more marketable. VC managers tolerate underpricing because they obtain indications on other hot and underpriced allocations, which will allow them to attain some personal risk-free capital gains in a very short time. Furthermore, banks guarantee VCs their support for future market opportunities. Coakley et al (2009) undertook research on venture-capital-backed IPOs in the UK for the period 1985-2003 and found empirical evidence on spinning, but only during the dotcom bubble. The spinning practice will be discussed further in the following section.

2.1. *Grandstanding theory*

According to Sirri and Tufano (1993) and Lee and Wahal (2004), reputation is a key factor for venture capital firms. Their funding activity is strictly correlated to past performance, which is often measured by the number of IPOs sponsored by each fund (Sirri and Tufano, 1993). The finite lifetime of venture partnerships leads to frequent recapitalizations since venture capitalists have to cease operations when not raising money. In order to obtain funds to recapitalize and invest in new projects, VCs need a strong reputation, often provided by quick and excellent results. Hence, Gompers (1996) states that VCs, especially if young, take companies to market after a few years, affirming that young VCs usually grandstand because they are anxious to build a solid reputation, which will grant them access to new sources of finance. Although it has been empirically shown that young VCs grandstand more than older VCs, grandstanding is common in VCs generally. This may be caused by hot issue periods, which offer ample investment opportunities to VCs who thus need money to invest in different ideas. Anecdotal evidence illustrates a high number of cases of established VCs leading young companies to market during the Internet bubble.[2] In his study, Gompers finds that on average VCs take companies to market after four to five years, a finding that is also supported by Lee and Wahal (2004).[3] Leading companies to IPO is a clear signal and provides strong evidence of highly developed skills in aggressively managing portfolios with the aim of obtaining higher returns in a few years. In fact, Sahlman (1990) attests that the biggest portion of VC returns is earned on IPO operations. As argued by Welch (1989), Grinblatt and Hwang (1989) and Allen and Faulhalber (1989), underpricing may be part of a defined strategy based on signaling models. In these models, underpricing would be seen as a signal of quality given

---

[2] An excellent example is given by the Sequoia Capital case, the most renowned VC fund in Silicon Valley, which brought numerous young companies to market during the Internet bubble years.

[3] A former model developed by Gompers (1993) shows that VCs prefer to bear the cost of underpricing by taking companies public after a few years rather than trying to maximize their return on a single investment. Limited partnerships usually have a short lifespan, such as ten years. This means that returns must be earned quickly, and that the more investments they make, the more return opportunities they create (Gompers and Lerner, 1998).

by the issuer to the market, since only a good company is able to bear this cost and recoup it in the future. Thus, underpricing is a heavy burden for venture capital firms when VCs need to fully exit from the investment to obtain funds for other projects. While other studies argue that VCs remain on the board of directors even beyond the IPO, Gompers (1996) affirms that when VCs have to move quickly they cannot wait long before cashing out, which leads to a further consideration: in order to reduce wealth losses due to underpricing, the stake held by VCs needing to sell the majority of their shares at IPO cannot be large.[4] Lin and Smith (1995) find that the cost sustained by VCs when taking companies to market too early is strongly linked to the percentage of shares retained. Retaining too many shares does not allow VCs to reposition their resources elsewhere. At the same time, Lin and Smith (1995) also argue that high-reputation VCs experience less underpricing when selling the majority of their shares. This is probably due to the fact that the market does not perceive a negative signal in their behavior, since well-established VCs have a solid reputation. Thus, no big risk premiums are required through underpricing. In conclusion, the amount of costs VCs have to bear when prematurely taking companies to market depends on the stake held in the company and on the need to cash out.

Focusing on the UK, Jelic et al. (2005) conducted a study on VC-backed MBOs, finding that these are usually underpriced to a greater extent than non-VC-backed buyouts. A similar result was found by Espenlaub et al (2000). Nevertheless, it is interesting to note that although Barnes and McCarthy (2002) state that VCs usually take companies public after a few years, they find no evidence that VC-backed IPOs are significantly more underpriced than non-VC-backed IPOs. In fact, according to the reputation theory discussed at the beginning of this section, they argue that young VCs usually rush companies to market and obtain new funds sooner than old VCs. Yet VCs do not appear to bear the cost of underpricing. Given the theories discussed earlier, this finding seems contradictory and illogical. While there is no doubt that young companies going public have a higher risk profile and structurally present greater ex-ante uncertainty due to factors related to the first phase of their lifecycle, why the market should not require greater compensation when purchasing shares issued by a risky company remains undefined.

---

[4] This statement is not actually very coherent with other theories arguing that the greater the share overhang (calculated as shares retained by the leading VC/shares issued by the company) the greater the underpricing, since this would not concern VCs when the majority of the stake is retained. At times, VCs retain shares anticipating an increasing trend in stock prices.

2.2. Spinning practice

Loughran and Ritter (2004) consider a number of hypothesis to elucidate the underpricing phenomenon. As documented by Ritter (1984), riskier IPOs are more underpriced. It has thus been widely assumed in literature that underpricing is a form of compensation offered to investors who face greater risks. This theory is known as the *changing risk composition hypothesis* (Loughran and Ritter, 2004). Another explanation concerns what the authors call the *realignment of incentives hypothesis*, implying that issuers accept leaving money on the table for several reasons. The third and last theory proposed is the *changing issuer objective function hypothesis*, which can be split into two parts. The first is known as the *analyst lust hypothesis*, which claims that issuers will allow underwriters to underprice new issues in exchange for future analyst coverage to provide strong buy recommendations on the issuer's shares. The second hypothesis is related to the *spinning practice*, which is supposedly one of the main reasons why VC-backed IPOs are on average more underpriced (if they are). In essence, issuers would look for underwriters with a reputation for underpricing new issues. This may occur for a number of reasons. First, underwriters find underpricing new shares convenient to be able to offer their clients high first-day returns, which will increase their reputation and thus the number of subscribers (and commissions paid). Since underwriters use the book-building method, their discretion in allocating shares would completely eliminate both the winner's curse problem and any kind of asymmetric information (Loughran and Ritter, 2004). Second, a *quid pro quo* agreement takes place between the issuer and the bank in view of the fact that issuers tolerate underpricing and require something in return. IPO decision-makers often receive side payments by way of underwriters providing indications on other hot issues. VC managers thus benefit personally from underpricing, obtaining suggestions on quick return opportunities in exchange. Furthermore, banks frequently promise to sponsor their future market opportunities, which will allow VCs to establish convenient relations with underwriters (UWs) and thus lead companies more easily to market. An interesting study was conducted in 2006 by Coakley et al (2009) on the UK market. The authors did not find any empirical evidence that VCs grandstand and build relationships with banks that lead to spinning behaviors in the pre-bubble years. Nevertheless, they show that grandstanding and spinning during the bubble years (1998-2000) were significant, proving that a large number of institutions acted opportunistically in order to exploit investor sentiment in these years.

3. Data and methodology

3.1. Data mining

The dataset used for the analysis contains a sample of 507 IPOs that took place on the UK Alternative Investment Market (AIM) from January 1, 2004 to December 31, 2010. During this period, 1,132 companies went public on this market and thus our sample represents 44.79% of the total number of IPOs. The list of IPOs was taken from the London Stock Exchange website, which also discloses the IPO date and sector for each firm gone public. SEOs and reallocations from the Main Market to AIM were excluded. Only half the total number of IPOs were considered due to lack of data. Following outlier detection, some further observations were deleted from the sample. Outlier detection concerns two variables: first-day underpricing and total money raised, the only data available on Bloomberg prior to individually analyzing IPO prospectuses. Outliers deleted from the sample were those with a distance from the mean of at least +/- five times the standard deviation. Thus, the percentage of IPOs for each year considered ranges between 43% and 48%. Delisted companies were also considered, taking into account both successful and unsuccessful cases. The sample was divided into venture-capital-backed IPOs (99 observations) and non-venture-capital-backed IPOs (408 observations).[5] Financial IPOs account for 22.68% of the total sample (115 observations).[6] This result is in line with the total percentage of financial firms listed on AIM in 2011 (around 23%). The sample used for this sector is therefore considered representative. Excluding financial IPOs from the sample would have provided an imprecise and unreliable picture of AIM UK. Although financial firms are usually deleted from samples in literature, we decided to retain these for our analysis. However, in order to avoid biases that could arise from anomalous trends in the financial industry, the models were also controlled by excluding financial firms. Information on financial data, funds raised and initial offer prices were collected from both the IPO prospectuses and Bloomberg, which enabled double-checking the information provided by both sides to verify its accuracy. Whenever a mismatch occurred, the data from the IPO prospectuses were considered more reliable. The Sales to Total Assets ratio was constructed through the Pre-IPO financial data while GBP was the currency used. Incorporation dates were collected through the

---

[5] In order to establish whether a firm was VC-backed or not, the IPO prospectus of each company was analyzed. AIM Rule 26 obliges companies to disclose information on the pre-IPO ownership structure, which is necessary to determine if a company was supported by one or more venture capital funds. When available, information on VCs was taken from the British Venture Capital Association (BVCA) or from venture capital fund websites. When a syndicate existed, information on the lead VC was used.

[6] Financial IPOs are related to these sectors: Banks, Equity Investment Instruments, General Financial, Insurance, Non-Equity Instruments and Real Estate.

IPO prospectuses or company websites to calculate the age of the firm going public. Whenever the incorporation date did not coincide with the foundation date, the former was not considered as indicative.[7] Underpricing was calculated as the percentage differential of the first-day closing price and the offer price, both found on Bloomberg. The offer price was compared to the information from the IPO prospectus, which also provides data on the amount of shares issued and total money raised. Information on leading NOMADs and brokers was derived from the IPO list on the London Stock Exchange website. Brokers also operate as NOMADs in most of the IPOs included in the dataset. Whenever this was not the case, underwriter ranking - used to calculate the proxy representing spinning practice - was correlated to the broker. Underwriter ranking was derived from Carter and Manaster's index, which ranks US underwriters on a scale of zero to nine with a rank of eight or nine given to prestigious underwriters. Since our analysis was undertaken on AIM UK, some NOMADs/brokers were not included in the Carter and Manaster ranking. The following criterion was used to assign a grade to each underwriter: if underwriters sponsored less than 15 IPOs included in the sample, they were considered as non-prestigious underwriters while those who sponsored at least 15 IPOs were included amongst prestigious underwriters.[8]

3.2. Dataset Description

The most prominent sector in the sample is Mining (59 observations), followed by General Financial (48 IPOs), Oil & Gas (43 observations), Support Services (42 observations), Software & Computers (39 IPOs), Real Estate (37 observations). Financial IPOs account for 22.68% of the total sample. The sectors with the highest number of venture-capital-backed firms are Pharma & Biotech, Software & Computers (both with 14 VC-backed observations) and Chemicals (12 observations). In percentage terms, the sector with the largest number of VC-backed IPOs is Pharma & Biotech (87.5%), followed by Chemicals (85.71%) and Alternative Energy (80%) (see Appendix 1 for further details).

---

[7] For example, incorporation dates related to new holding companies are not useful in determining when the business was established. As a matter of fact, incorporations of parent companies often occur a few months before the IPO, showing that these firms are created with the sole purpose of representing the entire group on AIM. The foundation dates were taken into account to establish when the groups started running their businesses.

[8] We are aware of the bias that may be generated by this criterion, since the quantity of sponsored IPOs is not always synonymous with quality. Nevertheless, NOMADs have a particular role in AIM regulation. Therefore, the number of sponsored IPOs seems to be the most appropriate choice to represent reputation, since it should reflect the credibility of underwriters and how much firms going public trust them. Having stated that VCs grandstand companies to increase the number of sponsored IPOs and then improve their reputation, it can also be argued that the number of operations undertaken by underwriters is strictly related to their reputation. Given the above criterion, it was not possible to calculate the average underwriter rank for the entire sample and for VC-backed or non-VC-backed observations.

(Insert Table 1 about here)

Average underpricing is 16.7%, which is coherent with the average evidence reported in previous studies (Ibbotson et al, 1994). Venture-capital-backed IPO underpricing was found to be extremely high (25.8%), while non-venture-capital-backed IPOs are underpriced less than the average (14.6%). The underpricing differential is thus 11.2%, which clearly indicates that venture-capital-backed IPOs are underpriced on average much more than non-venture-capital-backed IPOs. This is a fundamental consideration for the analysis we perform in the next section, since the descriptive data show that the certification role of VCs does not work as argued by Barry et al (1990) and Megginson and Weiss (1991). To the contrary, it seems that the data support the second school of thought discussed in section 2 (Lee and Wahal, 2004), but it has yet to be proven that these results are caused by VC moral hazard behaviors such as *grandstanding* and *spinning*. Underpricing was relatively high before 2008, while IPOs were on average slightly overpriced during 2009. Generally speaking, underpricing reduces over the years considered in our sample. A downward trend manifested for both venture-backed and non-venture-backed IPOs.

(Insert Table 2 about here)

The average time to IPO is 6.31 years, which is slightly lower than the average time to go public for non-venture-capital-backed firms (6.86 years). In line with expectations, VC-backed firms need only 3.49 years to go public (on average); time to IPO increased during the financial crisis.

Grandstanded firms are defined as VC-backed companies that went public aged zero to four years. Hence, the following percentages concern only VC-backed observations. The average percentage of grandstanded firms in the total sample is 74.75% (74 observations out of 99). This indicates that almost three out of four VC-backed firms went public when aged four years or less. This result seems to support the grandstanding theory. Notwithstanding this, grandstanded firms significantly decreased during the financial crisis. Those sectors that are usually VC-backed experienced a high percentage of grandstanded firms, namely, 100% for IT, 85.7% for Pharma & Biotech, 75% for Chemicals, 66.67% for Electronic and 33.33% for Health and Healthcare (see Appendix 2 for further details). Prestigious underwriters supported IPOs prior to the financial crisis, while only five VC-backed IPOs occur in the sample after 2007 and only one of these is sponsored by a prestigious UW. Around 47% of VC-backed companies chose a prestigious underwriter before the financial crisis. Thereafter, the spinning effect decreases and eventually disappears given that

after 2007 only a few VC-backed companies were taken to market. It could thus be hypothesized that both grandstanding and spinning did not exist during the 2008 financial crisis or during crises in general (Coakley et al., 2009).

(Insert Table 3 about here)

The most underpriced sectors are Pharma & Biotech (54.74%), Health & Healthcare (31.75%) and IT (30.08%), which all experienced underpricing above 30%. If we take into account VC-backed IPOs only, the most underpriced sectors are Specialty and Other Finance (80%), Food Producers (72.62%), Health & Healthcare (70.56%), Pharma & Biotech (68.41%) and IT (40.37%). These figures indicate that the two most underpriced sectors – considering VC-backed observations only – are not typical sectors that venture capitalists invest in. Going into further detail, VC-backed observations in Specialty and Other Finance account for only 3.85% of the total number of IPOs in this sector (only one observation), while the number of VC-backed IPOs in Food Producers is 18.18% (two observations overall). Thus, excluding the sectors with low venture-backing frequency, the results obtained are in line with expectations, since the most underpriced sectors are those with the highest percentage of VC-backed IPOs.

To enable a more detailed analysis, the sample was divided into two sub-samples considering the pre-crisis and financial crisis periods of the economic cycle separately. The first includes 463 observations from 2004 to 2007, while the second contains 44 IPOs that took place between 2008 and 2010.[9]

3.3. *The variables and their definition*

Herewith following we describe the variables used in the OLS regression framework in our study.

I.

% Underpricing: calculated as the percentage differential between the closing price after the first day of trading and the initial offer price. This is the dependent variable used in the regressions. Prices are in GBP.

---

[9] Although the real estate crisis began in 2007 in the US, the effects on the equity capital market occurred only in 2008, starting from the US ECM and then hitting the entire economic system. This is why 2007 was excluded from the financial crisis sample, which includes 2008, 2009 and 2010.

II.

VC dummy: indicating venture backing. A value of one represents venture-capital-backed IPOs.

III.

AGE: age is measured as the difference between the IPO date and the incorporation/foundation date and represents the timeframe to going public. Young companies are supposedly more underpriced than old firms due to a higher level of uncertainty. The coefficients are thus assumed to be negative.

IV.

SALES/ TOT. ASSETS Ratio: this ratio was created because sales are not always indicative and must be compared to firm size. Total Assets (which include both financial and operating assets) was chosen as a proxy of firm size. A low Sales/Total Assets ratio implies greater risk and hence higher underpricing is expected. If high values decrease underpricing, negative coefficients are expected. Financial data are in GBP millions.

V.

MONEY RAISED/ TOT. ASSETS: this shows the gross amount of proceeds collected through the IPO in relation to the assets of the firm going public. The amount raised cannot be taken alone since it would not indicate if enough money was raised at the IPO date. In order to build a more explicative predictor, Total Assets was again chosen as a proxy of firm size. Fees were not taken into account, since underwriters generally apply the same fixed percentages. Data are in GBP millions.

VI.

UW dummy: a value of one represents prestigious underwriters (underwriters with a ranking of 8 or 9). If the spinning theory holds, a prestigious UW should increase underpricing with positive coefficients. The results may vary depending on the period of time considered.

VII.

MATURITY INDEX: this is constructed through the interaction between AGE and SALES/ASSETS ratio. It is assumed to be high for low-risk companies that should experience a low level of underpricing. The coefficients are therefore assumed to be negative.

VIII.

CRISIS dummy: The IPOs that took place during 2008, 2009 and 2010 have a value of one; the others have a value of zero. The aim of this dummy is to understand whether the financial crisis explains underpricing.

IX.

GRANDSTANDING: a proxy of grandstanding was produced through the interaction between the VC dummy and the Young Firm dummy (Flagg, 2007). The Young Firm dummy assigns a value of one to companies going public aged zero to four, while a value of zero is given to companies aged five or more. According to Gompers (1996), grandstanding should explain why VC-backed IPOs are more underpriced. If this theory holds, the coefficients are expected to be positive. The grandstanding dummy has a value of one when the considered observation is a VC-backed company that went public aged zero to four.

X.

SPINNING: a proxy of spinning is constructed by multiplying the VC dummy by the UW dummy (Flagg, 2007). If the spinning theory (Loughran and Ritter, 2004) is validated, this variable should explain and increase underpricing. A value of one is assigned to VC-backed companies that were sponsored by prestigious UWs; a value of zero is given to the others. The coefficients are expected to be positive if prestigious UWs and VCs increase the underpricing level when working together.

XI.

IPO year dummies: IPO years were used as control variables.

XII.

Industry dummies: industry dummies were created only if 20 or more IPOs took place in a specific sector in the sample.[10]

XIII.

Financial dummy: this assigns a value of one to financial sectors (Banks, Equity Investment Instruments, General Financial, Insurance, Non-Equity Investment Instruments and Real Estate) – which account for 115 observations (22.68% of the total sample) – while giving a value of zero to all others. The aim of this dummy is to determine whether the results change when considering financial IPOs.

XIV.

Share Overhang: calculated as the ratio between the shares retained by the venture capital fund and the total amount of shares issued. If a VC retains many shares, it should not be concerned about underpricing and the coefficients should thus be positive. *Share overhang* is used as a control variable.

---

[10] Dummies were used for the following sectors: Equity Investment Instruments, General Financial, IT & Electronic, Media, Mining, Oil & Gas, Real Estate, Software and Computers, Specialty and Other Finance, Support Services, Telecommunications and R&D Intensive, which includes Alternative Energy, Chemicals and Pharmaceuticals & Biotechnology. "Other Sectors" contains all remaining sectors. Industry dummies are used as control variables.

4. Empirical Results and Discussion

In this section, the results obtained through OLS regressions are presented. The main analysis was conducted on the entire sample, using the variables described in section 3.3. After discussing the main results, the analysis will briefly focus on the pre-crisis and crisis periods in order to determine and compare the main trends occurring in two different economic cycles.

4.1. Analysis of the overall period (2004-2010)

The main aim of the first two models used for the analysis is to understand whether venture backing explains and affects the underpricing phenomenon. The independent variables used for the regressions are VC DUMMY, UW DUMMY, CRISIS DUMMY, AGE, SALES/TOT.ASSETS and MONEY RAISED/TOT.ASSETS. Table 4 shows that venture backing strongly increases underpricing. Although the adjusted R-squared is only .101, most of the predictors show a p-value equal to .000 (or extremely close to it), proving that they are significant and reliable in explaining the dependent variable. As expected, SALES/TOT.ASSETS has a negative coefficient and its p-value equals .000, showing that higher ratios reduce underpricing. MONEY RAISED/TOT.ASSETS also has a p-value equivalent to .000 indicating that underpricing is positively correlated to the amount of money raised through IPOs (in relation to firm size). Another extremely significant variable is CRISIS DUMMY, which indicates that underpricing strongly decreased during the financial crisis. Furthermore, there are a few VC-backed observations in those years. As argued by Lerner (1994) and Gompers et al (2005), VCs frequently take companies public in hot issue periods in order to exploit positive trends. As far as AGE is concerned, this shows a negative coefficient and is significant at a confidence level equivalent to .966, which can be considered quite a good result. It can therefore be argued that the older a company is, the less the underpricing is (Muscarella and Vetsuypens, 1989), both because uncertainty on old firms is less and because old companies are less likely to be VC-backed, hence reducing on average the probability of high underpricing, as previously seen. The only variable that is hardly significant at a confidence level equal to .90 is the UW DUMMY, which is somewhat correlated to the VC DUMMY (-0.427). This actually leads the UW DUMMY to explain the underpricing effect less, which has already been partially captured by the VC DUMMY. Moreover, the UW DUMMY coefficient is negative, showing that on average prestigious UWs reduce

underpricing. Hence, financial IPOs account for almost a quarter of the entire sample and their weight may affect the UW DUMMY coefficient. Financial firms are expected to decrease underpricing when working with prestigious UWs, thanks to their expertise and valuation skills. The F test has a p-value equal to .000, confirming that the predictors fit the model well.

The following regression maintains the same independent variables but also includes the FINANCIAL DUMMY, generating interesting implications. The adjusted R-squared is higher than previously (0.148) and the F test produces a p-value of .000. AGE, SALES/TOT.ASSETS, MONEY RAISED/TOT.ASSETS and the VC DUMMY are extremely significant, showing a p-value equal or close to .000. The FINANCIAL DUMMY is also particularly significant and has a negative coefficient, proving that financial IPOs sharply reduce underpricing. The FINANCIAL DUMMY therefore proves that underpricing on average concerns real economy firms. An interesting consideration relates to the CRISIS DUMMY, which is no longer significant. This is likely to be due to the new variable included in the model, which perhaps captures the underpricing effect much better. The UW DUMMY is relatively significant (at a 97% confidence level) and its coefficient is positive, after controlling for financial IPOs. Since its coefficient was negative before adding the FINANCIAL DUMMY to the model, it would appear that prestigious underwriters reduce underpricing only when working with financial firms.

In the third regression, our main assumptions are applied to the model. In fact, proxies representing grandstanding and spinning are added as major predictors. Both are significant at a confidence level of .98 and their coefficients are positive, showing that the grandstanding theory and the spinning hypothesis are supported by empirical evidence. This means that venture capital funds *do* grandstand companies in order to cash out quickly and increase their reputation, taking a large number of young companies to market. This would mainly occur when there are many investment opportunities to seize. The spinning hypothesis also stands and it can thus be argued that VCs and prestigious UWs strike *quid pro quo* agreements in order to take reciprocal advantage of their relations. After controlling for GRANDSTANDING and SPINNING, the VC DUMMY and the UW DUMMY show negative coefficients, proving that both VCs and prestigious UWs reduce underpricing if grandstanding and spinning are isolated as independent variables. Except for the CRISIS DUMMY, which is not significant, as shown in the previous model, all other predictors are reliable. The FINANCIAL DUMMY confirms that financial companies are on average less underpriced, unaffected by grandstanding and spinning, since none of the financial IPOs considered are VC-backed. The adjusted R-squared of the model is .167 and the p-value for the F test is .000.

Further regressions were used as robustness checks for the previous models. The first analyzes the results and potential changes occurring when controlling for industry and year effects.

Table 5 shows that the model also holds when using the YEAR DUMMIES and the INDUSTRY DUMMIES. Age is not as significant as before, but a confidence level of 95% is still acceptable. The adjusted R-squared is .169 and the p-value is still .000, sustaining the strength of the model.

(Insert Table 5 about here)

The second robustness check concerns financial IPOs. In order to realign with the main methodology used in literature, core models were also tested when financial IPOs are not considered, decreasing the sample used to 392 observations. Table 6 shows that the models hold when controlling without financial firms. The variables are as significant as before, while the CRISIS DUMMY is not significant at all, as expected. The adjusted R-squared are .154 and .159 and the F-tests support the strength of the analysis (the p-value is .000). The model concerning grandstanding and spinning was controlled for YEAR DUMMIES and INDUSTRY DUMMIES, confirming its robustness.

(Insert Table 6 about here)

Some other variables were added to enrich the model and undertake further analyses. The first predictor added is *share overhang*. In the model, SHARE OVERHANG has a positive coefficient and should thus increase underpricing (see Table 7). Although the other variables are significant (except for the CRISIS DUMMY, which is not significant), SHARE OVERHANG has a very high p-value (.13). This does not consent any definite considerations about this predictor and therefore does not enable stating that the effect shown by the model is absolutely correct. The adjusted R-squared is fairly satisfying (.168) while the F test shows a p-value of .000.

The MATURITY INDEX was then added to the model (see Table 7). The MATURITY INDEX is constructed through the interaction between AGE and SALES/TOT.ASSETS, and should represent a better proxy of risk. The coefficients are expected to be negative, since the values are assumed to be greater for older companies, which should have higher sales. If a firm is facing a strong expansion period, or operates in a capital-intensive sector, TOT.ASSETS could increase sharply and hence decrease the ratio. Therefore, when multiplying SALES/TOT. ASSETS by AGE, the value given should provide better indications on the company risk-profile. Young companies are expected to have low MATURITY INDEX values, both because of their age and the low sales volumes experienced in the first phase of their lifecycle. Contrary to our expectations, we find that the MATURITY INDEX shows a positive coefficient. Thus, underpricing does not appear to be

related to the youth of firms *per se* while other factors - such as the role played by VC funds - appear to interact in the relationship between young companies and underpricing. The model shows a small rise in the adjusted R-squared (.172) while the F test still gives excellent results (the p-value equals .000). The variables used are all significant with confidence levels between 0.96 and 0.99, except for the CRISIS DUMMY, which is not significant, while the UW and VC DUMMY are only significant at a 10% level. AGE and SALES/TOT.ASSETS are moderately correlated to the MATURITY INDEX (around 0.55) as expected.

(Insert Table 7 about here)

The preceding models all show that venture backing strongly increases the underpricing phenomenon. In spite of this, after controlling for grandstanding and spinning, which are both statistically significant, it has been demonstrated that venture backing reduces average underpricing. Thus, first-day returns are sharply driven by the grandstanding and spinning hypotheses, whose consistency is verified and supported by empirical evidence also when controlling for industry and year or when financial companies are excluded from the sample. We may thus conclude that VCs play a certification role only when grandstanding and spinning do not hold.[11] The next stage of the analysis aims to understand whether the trends and results found in the overall period also occurred during the pre-crisis and the financial crisis periods, or whether the financial crisis is characterized by other outcomes.

4.2. Analysis of the pre-crisis period (2004-2007)

The number of IPOs considered in this period is 463, which is 91.32% of the entire sample. The year 2007 was included in the pre-crisis sample because the UK equity capital market had not yet been affected by the financial crisis that concerned the real estate market in the US at the time.[12] Table 8 shows the basic model used for the previous analyses. All the predictors are exceptionally significant. The UW DUMMY is the only non-significant variable with a 99% confidence level. Thus, venture-backing and prestigious underwriters increased underpricing during the years before the financial crisis by respectively 18.2% and 8.4%. The adjusted R-squared is slightly lower than previously (.146), while the F test provides an excellent result (p-value = .000).

---

[11] An interesting observation can be made about financial firms: they consistently decrease underpricing, probably as a result of their expertise (Peavy, 1990).

[12] Since the sample was divided into two different periods, the CRISIS DUMMY was dropped from the model.

In the next regression, GRANDSTANDING and SPINNING are added to the model. Except for the VC DUMMY and the UW DUMMY, all other variables are extremely significant. For this reason, we can assert that both the grandstanding and spinning hypotheses hold during the pre-crisis years, confirming the overall period findings.[13] After controlling for GRANDSTANDING and SPINNING, the VC and UW DUMMY again show a negative coefficient, proving that VCs and prestigious UWs reduce average underpricing when grandstanding and spinning are isolated as predictors. The adjusted R-squared increases to .164, which is a positive result, since underpricing is a very complex phenomenon that could be explained in several ways. The F-test provides positive indications on the strength of the model (its p-value is .000).

The results show that the models hold even when financial firms are excluded from the sample. Grandstanding and spinning are slightly less significant than previously, but the confidence levels of 95% and 97% still apply and thus confirm the main assumptions of the model. The model based on the whole sample and including grandstanding and spinning was also controlled for industry and year effects. The results are the same as before, but AGE is significant only at a 95% confidence level. The adjusted R-squared reaches .161.

(Insert Table 8 about here)

SHARE OVERHANG was considered thereafter. Its p-value is around .16, a result that does not improve the previous outcomes. In fact, a confidence level of 0.84 is too high to be used and hence no definite considerations can be made on share overhang and its relation to the dependent variable. The F-Test (p-value = .000) and the adjusted R-squared (.165) are still satisfactory.

In the next regression, share overhang is replaced by the MATURITY INDEX. We still observe a positive coefficient of this variable, in contrast to our initial expectations. The adjusted R-squared jumps to .170, while the F-test confirms that the data fit the model well. All the variables used have a comparatively high degree of reliability, except for the VC DUMMY and the UW DUMMY, which are less significant when GRANDSTANDING and SPINNING are included in the regressions. The FINANCIAL DUMMY validates the assumptions on financial IPOs (the coefficient is negative); moreover, the grandstanding and spinning theories stand at a confidence level of 95% and 98%. The MATURITY INDEX is significant at 0.955, but is highly correlated with AGE (with a correlation coefficient equal to 0.558) and SALES/TOT.ASSETS (correlation coefficient of 0.534).

---

[13] Since a confidence level of 97.5% can be used for grandstanding and 98% for spinning, the proxies representing these theories can be considered reliable and efficient.

In conclusion, we can infer that the grandstanding and spinning theories also hold in the pre-crisis period, but after controlling for these, the VC DUMMY and UW DUMMY show negative coefficients, confirming that without opportunistic behaviors venture capital funds and prestigious underwriters reduce underpricing. Furthermore, all the main results in the overall period analysis can also be found here. The models hold even when excluding financial firms and controlling for industry and year effects. Financial IPOs are confirmed as less underpriced on average, MONEY RAISED and SALES/TOT. ASSETS are in line with expectations, although doubts on the SHARE OVERHANG issue have not been settled. Moreover, AGE is less significant during 2004-2007 than during the overall period. The last step of the analysis concerns the financial crisis. Contradicting results are expected, since grandstanding and spinning should characterize hot issue periods, while the timeframe 2008-2010 is a dark chapter in the world's economic history and in financial markets.

4.3.   Analysis of the crisis period (2008-2010)

The sample used for the following analysis contains only 44 observations, and includes FY2008, FY2009 and FY2010. Among the IPOs considered, only five are venture-capital-backed. Given the low number of observations in this sample, the results are not expected to be very significant. Apart from the CRISIS DUMMY, some other variables were dropped from the model. SHARE OVERHANG cannot be included in regressions, since there are only five VC-backed IPOs and the results would be worthless for a correct interpretation. Industry dummies were not taken into account given the reduced sample size. IPO year dummies were also excluded, since they almost never show statistically relevant outcomes. Furthermore, since SALES/TOT.ASSETS and AGE are not expected to be good predictors as previously, the MATURITY INDEX would not fit the model appropriately. Thus, the control variables were dropped and the regressions in this period only concern the basic assumptions. Nevertheless, GRANDSTANDING and SPINNING are not expected to be useful in providing empirical evidence, as both their proxies are interactions based on the VC DUMMY, which assumes the value of one only five times out of 44. Table 10 shows the basic model tested. The adjusted R-squared is .062, while the F test gives negative results, since its p-value is very high (.219). This indicates that the predictors do not fit the model, as anticipated. The variables are actually never significant, except for the FINANCIAL DUMMY (p-value = .018). The only relevant statistical result is therefore that financial firms reduce underpricing, as also shown in the previous models. Predictors that were totally reliable, such as AGE, SALES/TOT.

ASSETS and MONEY RAISED/TOT.ASSETS, do not in any way explain the dependent variable. Aside from the fact that the sample size is considerably small, equity capital market performances may strongly affect the results. AGE and SALES/TOT.ASSETS, which were considered proxies of risk, no longer work efficiently. In addition, a relation with underpricing is difficult to find given very low or no first-day returns. As far as MONEY RAISED/TOT. ASSETS is concerned, the non-significant result obtained can be justified with the same explanations given previously. Money raised during the financial crisis decreased substantially and this is assumed to reduce underpricing. Although the MONEY RAISED p-value is extremely high, the related coefficient is negative, indicating (although not supported by empirical evidence) that a smaller amount of money raised leads to lower underpricing. The VC DUMMY and UW DUMMY are also non-significant. They were expected to have negative coefficients. Venture capital funds and prestigious underwriters are not assumed to increase underpricing in recession periods, since they cannot fight the negative market trend. Again, the explanations given are rational but cannot be supported by statistical evidence.

The last step concerns GRANDSTANDING and SPINNING. As for the previous regression, SALES/TOT. ASSETS, MONEY RAISED/TOT. ASSETS and AGE are not significant, while the FINANCIAL DUMMY can be considered at a confidence level of .982. The FINANCIAL DUMMY once again has a negative coefficient. GRANDSTANDING and SPINNING are totally non-significant, but are not expected to hold over the time horizon considered. In fact, venture capitalists encounter numerous difficulties when exiting through IPOs during crises and also have to deal with negative market sentiment, which does not allow the initial offer price to rise once securities are available for trading. It is thus rather difficult to underprice shares, and the most likely scenario is that underpricing is close to zero, or there may be small upward or downward adjustments to the initial offer price. The model does not have any statistical relevance here, as proven by the low adjusted R-squared (.03) and by the high p-value shown by the F-test (.35). The empirical evidence therefore does not support the previous interpretations. Although the crisis models are not statistically useful, it can be argued that the grandstanding and spinning theories do not hold after bubbles burst, as indicated by Coakley et al. (2009). They conducted a similar study on the UK Main Market using a different time horizon and proving that spinning is significant only during the dotcom bubble, the hot issue period analyzed in their sample.

(Insert Table 10 about here)

Although the findings are supported by the broad literature (Gompers, 1996; Habib and Ljungqvist, 2000; Bradley and Jordan, 2002; Loughran and Ritter, 2004; Lee and Wahal, 2004; Gompers et al, 2005), the limitations of this research must be acknowledged. First, it is not possible to support the assumptions and considerations made for the financial crisis period (2008-2010) with sound empirical evidence. This is because few IPOs took place over the entire period and thus the sample size used for the analysis is not robust enough for significant tests. In addition, underpricing is negative or close to zero during the financial crisis period and is therefore difficult to explain through significant predictors. Secondly, the UW DUMMY is not entirely constructed through a validated ranking for underwriters. The UWs sponsoring IPOs in the sample were not always found in the Carter and Manaster ranking. The criterion constructed to assign ranks to those underwriters not taken into account by Carter and Manaster have been clearly specified, but may not be considered representative of the reality. Thus, bias could have been generated on a variable that assumes a critical role in this research, since it is also used to create the proxy representing the *spinning theory*.[14] Finally, some issues regarding venture capitalists must be discussed. First, information on pre-IPO ownership structures was collected from IPO prospectuses. Therefore, when a venture capital fund exited through an M&A deal some years before the IPO, such information was missing and the observation was considered non-venture-capital-backed. Since the majority of VC-backed IPOs are grandstanded (hence, firms going public were aged zero to four), an M&A deal is unlikely for at least 75% of the VC-backed observations. Lastly, venture backing could be an endogenous choice (Lee and Wahal, 2004). Some entrepreneurs do not want venture capitalists to manage their firms, or are unable to obtain their financing. Thus, when arguing that venture backing causes some effects, it is unclear whether these effects are caused by venture capitalists. It may be that VCs prefer to invest in companies that are already experiencing similar effects and thus venture backing would not actually generate any of these. Although Bradley and Jordan (2002) demonstrate that VC-backed IPOs are generally more underpriced, they do not address the cause of underpricing in terms of venture backing itself, but argue that VCs usually invest in industries that are already highly underpriced.

---

[14] In fact, SPINNING is assumed to increase the underpricing (Loughran and Ritter, 2004) of VC-backed IPOs. Nevertheless, if assuming that VCs grandstand in order to increase the number of sponsored IPOs and thus their reputation, it could be asserted that only prestigious UWs deal with a high volume of transactions. Furthermore, since NOMADs (who often operate as underwriters) risk their own reputation when sponsoring companies on UK AIM, it could be argued that only quality underwriters are able to help a lot of companies go public. Therefore, the criterion used to construct the UW DUMMY also has some pros.

5. Conclusions

The aim of this research is to verify whether venture capitalists increase average underpricing of companies going public. In literature, a broad school of thought has empirically proven that venture capital backed IPOs are on average more underpriced. As discussed in the previous sections, the most popular explanations of this phenomenon lead to the grandstanding and spinning theories. Our contribution is related to the time period - including the 2008 financial crisis and its effects and implications - and market analyzed. Despite that the UK equity capital market is one of the most developed in the world and the closest to the US market, most studies on underpricing have been undertaken on the US market. Moreover, UK is the most relevant European country for venture capitalists, since they play a vital role in the entire British economy. The AIM Market serves as an ideal marketplace for their exit processes. We considered this a suitable rationale to fill this gap and provide new research on the UK market. The regressions clearly show that the assumptions on grandstanding and spinning by VCs hold over the entire period considered and during the pre-crisis years (2004-2007). The limited sample size concerning the financial crisis period (2008-2010) does not enable reaching any statistically significant conclusions in terms of these years, although none of the theories considered should hold during negative economic cycles.

Our new empirical evidence leads to affirming that agency theory issues, such as grandstanding and spinning, *do* affect venture-capital-backed IPO underpricing. Nevertheless, after controlling for grandstanding and spinning we find evidence that venture capitalists and prestigious underwriters reduce underpricing, again in line with previous evidence (Barry et. al, 1990; Carter and Manaster, 1990; Megginson and Weiss, 1991). Thus, it may be argued that when avoiding moral hazard behaviors, VCs assume a certification role, reducing information asymmetry and thus underpricing (Coakley et al., 2009). Agency theory issues are likely to arise during hot issue periods and FY 2004 to FY 2007 can be considered as the hottest period ever on AIM UK.[15]

Some general questions remain for scholars studying IPO events and the behaviors of financial actors involved therein. The first main question is why rational investors do not appear to anticipate underpricing in light of the overwhelming evidence of this phenomenon, especially in hot issue periods. Is underpricing just the rational price of grandstanding and spinning practices? Or rather, does it once again concern the noted book-building inefficiency? Our study may be helpful in completing the base on which future scholars may build further knowledge to answer the

---

[15] In fact, the highest peak of money raised through IPOs was reached in these years. In particular, in FY 2007 £16.2 billion was cumulatively raised in IPOs and SEOs on AIM UK.

aforementioned questions. Furthermore, our evidence may be beneficial to UK market regulators in evaluating the introduction of "Anti Spinning" rules according to the US Rule 5131 model.

References

Allen, F. and Faulhalber, G. (1989). Signaling by underpricing in the IPO market. Journal of Financial Economics 23, 303-323.

Barnes, E. and McCarthy Y. (2002). Grandstanding in the UK venture capital industry. The Journal of Alternative Investments 6, 60-80.

Barry, C., Muscarella, C., Peavy, J. and Vetsuypens M. (1990). The role of venture capital in the creation of public companies: evidence from the going public process. Journal of Financial Economics 27, 447-472.

Bessler, W. and Seim, M. (2011). European venture backed IPOs: an empirical analysis. Working Paper. European Venture Capital Association (EVCA).

Bradley, D. and Jordan, B. (2002). Partial adjustment to public information and IPO Underpricing. Journal of Financial and Quantitative Analysis 37, 595–616.

Carter, R.B. and Manaster S. (1990). Initial public offerings and underwriter reputation. Journal of Finance 45, 1045-1067.

Chahine, S., Filatotchev, I. and Wright, M. (2007). Venture Capitalists, business angels and performance of entrepreneurial IPOs in the UK and France. Journal of Business Finance & Accounting 34, 505-528.

Coakley, J., Hadass, L., Wood A. (2009). UK IPO underpricing and venture capitalists. The European Journal of Finance 15, 421-435.

Espenlaub S., Garrett I. and Mun W. (2000). Conflicts of interest and the performance of venture-capital backed IPOs: a preliminary look at the UK. Journal of Entrepreneurial Finance 1, 325-349.

Flagg, D. (2007). Two Essays on Venture Capital: What Drives the underpricing of venture capital backed IPOs? And do venture capitalists provide anything more than money?. Unpublished Ph.D. thesis (University of South Florida).

Gompers, P. (1993). The theory, structure and performance of venture capital. Unpublished Ph.D. thesis (Harvard University, Cambridge, MA).

Gompers, P. (1996). Grandstanding in the venture capital industry. Journal of Financial Economics 42, 133-156.

Gompers, P., Kovner, A., Lerner, J. and Scharfstein, D. (2005). Venture capital investment cycles: the impact of public markets. Working Papers 11385, NBER.

Gompers, P. and Lerner, J. (1998). Conflict of interest in the issuance of public securities: evidence from venture capital. Working Papers 6847, NBER.

Grinblatt, M. and Hwang, C. (1989). Signaling and the pricing of unseasoned new issues. Journal of Finance 44, 383-420.

Habib, M.A. and Ljungqvist, A.P. (2001). Underpricing and entrepreneurial wealth losses in IPOs: theory and evidence. Review of Financial Studies 14, 433-458.

Ibbotson, R.G., Sindelar, J.L. and Ritter, Jay R. (1994). The market's problem with pricing of initial public offerings. Journal of Applied Corporate Finance 7, 66-74.

Jelic, R., Saadouni, B. and Wright, M. (2005). Performance of private to public MBOs: the role of venture capital. Journal of Business Finance & Accounting 32, 643-682.

Lee P. and Wahal S. (2004). Grandstanding, certification and the underpricing of the venture capital backed IPOs. Journal of Financial Economics 73, 375-407.

Lerner, J. (1994). Venture capitalists and the decision to go public. Journal of Financial Economics 35, 293-316.

Lin, T. and Smith, R.L. (1995). Insider reputation and selling decisions: the unwinding of venture capital investments during equity IPOs. Journal of Corporate Finance 4, 241-263.

London Stock Exchange (2011), AIM 15th Anniversary Factsheet.

Loughran T. and Ritter, J.R. (2004). Why has IPO underpricing changed overtime? Financial Management 33, 5-37.

Megginson, W. and Weiss, K. (1991). Venture capitalist certification in initial public offerings. Journal of Finance 46. 879-903.

Muscarella, C. and Vetsuypens M. (1989). Initial public offerings and information Asymmetry. Working Paper. Penn State University, University Park, PA; Southern Methodist University, Dallas, TX.

Neus, W. and Walz, U. (2004). Exit timing of venture capitalists in the course of initial public offering. Journal of Financial Intermediation 14, 253-277.

Oehler A., Rummer M. and Smith P.N. (2005). IPO pricing and the relative importance of investor sentiment – evidence from Germany. Working Paper.

Peavy, J.W. (1990). Returns on initial public offerings for closed-end funds. The Review of Financial Studies 3, 695-704.

Ritter, J.R. (1984). The "hot issue" market of 1980. Journal of Business 57, 215-240.

Sahlman, W. (1990). The structure and governance of venture capital organizations. Journal of Financial Economics 27, 473-521.

Sirri, E. and Tufano P. (1993). The demand for mutual fund services for individual investors. Working Paper, Harvard University, Cambridge, MA.

Welch, I. (1989). Seasoned offerings, imitation costs and the underpricing of initial public offerings. Journal of Finance 44, 421-449.

Table 1

Main descriptive statistics of the sample data

IPO year	Total			VCB		NVC	
	#	Avg. UP (%)	VCB (%)	#	Avg. UP (%)	#	Avg. UP (%)
2004	107	21.80%***	21.50%	23	27.90%***	84	20.10%***
2005	147	17.30%***	20.41%	30	24.30%***	117	15.50%***
2006	124	18.80%***	19.35%	24	25.50%**	100	17.20%***
2007	85	15.40%**	20.00%	17	32.10%**	68	11.30%***
2008	18	2.30%*	16.67%	3	4.60%*	15	1.50%**
2009	6	-2.10%*	0.00%	0	0.00%	6	-2.10%*
2010	20	3.30%**	10.00%	2	3.50%***	18	2.90%**
Avg.	**72**	**16.70%*****	**19.53%**	**14**	**25.80%*****	**58**	**14.60%*****

This table contains the main descriptive data regarding the sample of IPOs on the AIM Market UK selected for the analysis during the period 2004-2010. VC-backed IPOs (VCB) reveal the presence of a venture fund in the ownership structure of the listing firm. This table contains the average underpricing (Avg. UP) for the sample companies during the period 2004-2010. Underpricing is calculated as the percentage differential between the stock closing price after the first day of trading and the initial offer price. The table also reports the average underpricing (Avg. UP) registered by VC-backed companies (VCB) and Non VC-backed companies (NVC) in the same timeframe. P-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% levels respectively.

Table 2

Average age to IPO (2004-2010)

IPO Year	Avg. Age to IPO	Avg Age to IPO for VCB	Avg Age to IPO for NVC
2004	6.52***	3.30***	7.40***
2005	6.27***	3.13***	7.07***
2006	5.83***	4.08***	6.24***
2007	6.45**	3.50**	7.23**
2008	5.55**	4.33**	6.70**
2009	7.00*	0.00	7.00*
2010	6.70**	5.50**	7.94**
Total	**6.31***	**3.49***	**6.86***

This table shows the average age to IPO of the sample companies during the period 2004-2010 and the average age to IPO when splitting the sample between VC-backed companies (VCB) and Non VC-backed companies (NVC). P-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% levels respectively.

Table 3

Grandstanding and spinning main data (2004-2010)

IPO Year	Grandstanded companies (%)	VCB with prestigious UW	VCB with prestigious UW (%)
2004	73.91%	11	47.83%
2005	86.67%	14	46.67%
2006	58.33%	13	54.17%
2007	82.35%	8	47.06%
2008	66.67%	1	33.33%
2009	0.00%	0	0.00%
2010	50.00%	0	0.00%
Total	**74.75%**	**47**	**47.47%**

This table shows the percentage of grandstanded companies within the sample during the period 2004-2010. Grandstanded companies are those companies that are VC-backed (VCB) and aged zero to four. The table also reports the absolute and relative numbers of VC-backed companies (VCB) whose IPO was run by a prestigious underwriter (UW).

Table 4

Regression results for the basic model

Dependant variable: UNDERPRICING.			
	(1)	(2)	(3)
AGE	-0.009	-0.012	-0.011
	(0.034)**	(0.006)***	(0.012)**
MONEY RAISED/TOT. ASSETS	0.004	0.005	0.005
	(0.000)***	(0.000)***	(0.000)***
SALES/TOT. ASSETS	-0.090	-0.099	-0.094
	(0.000)***	(0.000)***	(0.000)***
VC DUMMY	0.167	0.178	-0.131
	(0.001)***	(0.002)***	(0.076)*
UW DUMMY	-0.034	0.095	-0.038
	(0.098)*	(0.027)**	(0.083)*
CRISIS DUMMY	-0.209	-0.067	-0.068
	(0.004)***	(0.386)	(0.370)
FINANCIAL DUMMY		-0.216	-0.208
		(0.000)***	(0.000)***
GRANDSTANDING			0.263
			(0.018)**
SPINNING			0.251
			(0.019)**
Constant	0.209	0.057	0.075
	(0.004)***	(0.273)	(0.150)
Adj R^2	0.101	0.148	0.167
Number of Observations	507	507	507

This table reports the underpricing of IPOs on the AIM UK during the 2004-2010 period in an OLS regression framework. Underpricing is calculated as the percentage differential between the closing price of the stock after the first day of trading and the initial offer price. Column 1 contains the results of the basic model, whereas Column 2 and Column 3 show the results when a dummy on IPOs belonging to financial sectors (financial dummy) and dummies for grandstanding and spinning are introduced. P-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% levels respectively.

Table 5

Robustness check for the basic model (I)

Dependant variable: UNDERPRICING.	
	(1)
AGE	-0.008
	(0.048)**
MONEY RAISED/TOT. ASSETS	0.005
	(0.000)***
SALES/TOT. ASSETS	-0.077
	(0.003)***
VC DUMMY	-0.089
	(0.072)*
UW DUMMY	-0.038
	(0.084)*
GRANDSTANDING	0.252
	(0.026)**
SPINNING	0.263
	(0.016)**
INDUSTRY	YES
IPO YEAR	YES
CONSTANT	0.190
	(0.089)*
Adj R^2	0.169
Number of Observations	507

This table serves as robustness check for the basic models presented in Table 4 It contains the results of the regression when controlling for industries (through Industry dummies) and years effects (through IPO year dummies). P-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% levels respectively.

Table 6

Robustness check for the basic model (II)

Dependant variable: UNDERPRICING.		
	(1)	(2)
AGE	-0.016	-0.012
	(0.003)***	(0.044)**
MONEY RAISED/TOT. ASSETS	0.006	0.006
	(0.000)***	(0.000)***
SALES/TOT. ASSETS	-0.106	-0.087
	(0.000)***	(0.004)***
VC DUMMY	0.160	-0.117
	(0.012)**	(0.074)*
UW DUMMY	0.100	-0.019
	(0.056)**	(0.089)*
CRISIS DUMMY	-0.177	
	(0.287)	
GRANDSTANDING		0.239
		(0.031)**
SPINNING		0.287
		(0.019)**
INDUSTRY (NO FINANCIALS)		YES
IPO YEAR		YES
Constant	0.307	0.302
	(0.000)***	(0.056)**
Adj R^2	0.154	0.159
Number of Observations	392	392

In this table the basic model is tested without considering the IPOs belonging to the financial sectors and controlled for the remaining industries and years effects in the overall period of the analysis (2004-2010). P-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% levels respectively.

Table 7

Robustness check for the basic model (III)

Dependant variable: UNDERPRICING.		
	(1)	(2)
AGE	-0.011	-0.017
	(0.011)**	(0.001)***
MONEY RAISED/TOT. ASSETS	0.005	0.005
	(0.000)***	(0.000)***
SALES/TOT. ASSETS	-0.091	-0.168
	(0.000)***	(0.000)***
VC DUMMY	-0.231	-0.113
	(0.064)*	(0.076)*
UW DUMMY	-0.040	-0.038
	(0.075)*	(0.091)*
CRISIS DUMMY	-0.068	-0.074
	(0.375)	(0.330)
FINANCIAL DUMMY	-0.208	-0.223
	(0.000)***	(0.000)***
GRANDSTANDING	0.271	0.234
	(0.015)**	(0.036)**
SPINNING	0.235	0.247
	(0.028)**	(0.020)**
SHARE OVERHANG	0.334	
	(0.130)	
MATURITY INDEX		0.007
		(0.043)**
Constant	0.073	0.330
	(0.164)	(0.000)***
Adj R2	0.168	0.172
Number of Observations	507	507

This table contains a further development of the basic models. In Column 1 the model includes the *share overhang* variable, calculated as the ratio between shares retained by VC funds/total shares issued, while in Column 2 the model is tested again introducing the *Maturity Index* that is calculated as the age multiplied by the ratio Sales/Total Assets. P-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% levels respectively.

Table 8

Regression results for the basic model in the pre-crisis period (2004-2007)

Dependant variable: UNDERPRICING.

	(1)	(2)	(3)	(4)
AGE	-0.013	-0.012	-0.017	-0.013
	(0.007)***	(0.013)**	(0.003)**	(0.033)**
MONEY RAISED/TOT. ASSETS	0.005	0.005	0.006	0.006
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
SALES/TOT. ASSETS	-0.102	-0.096	-0.107	-0.081
	(0.000)***	(0.000)***	(0.000)***	(0.001)***
VC DUMMY	0.184	-0.141	0.163	-0.123
	(0.003)***	(0.063)*	(0.017)**	(0.063)*
UW DUMMY	0.084	-0.024	0.096	-0.020
	(0.068)*	(0.087)*	(0.034)**	(0.082)*
FINANCIAL DUMMY	-0.212	-0.202		
	(0.000)***	(0.001)***		
GRANDSTANDING		0.268		0.254
		(0.025)**		(0.052)*
SPINNING		0.265		0.296
		(0.019)**		(0.023)**
INDUSTRY				YES
IPO YEAR				YES
CONSTANT	0.076	0.098	0.322	0.205
	(0.170)	(0.081)*	(0.000)***	(0.189)
Adj R^2	0.146	0.164	0.156	0.161
Number of Observations	463	463	357	357

This table reports the IPO underpricing on the AIM UK during the pre-crisis period (2004-2007) in an OLS regression framework. Column 1 contains the results of the basic model when a dummy on IPOs belonging to financial sectors (financial dummy) is introduced, whereas Column 2 extends the results when dummies for grandstanding and spinning are introduced. Column 3 contains the results of the model without considering IPOs belonging to the financial sectors (excluding the financial dummy) and Column 4 extends the results of the model when controlling for grandstanding and spinning dummies, industries and years effects. P-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% levels respectively.

Table 9

Robustness checks for the basic model in the pre-crisis period (2004-2007)

Dependant variable: UNDERPRICING.		
	(1)	(2)
AGE	-0.012	-0.018
	(0.012)**	(0.001)***
MONEY RAISED/TOT. ASSETS	0.005	0.005
	(0.000)***	(0.000)***
SALES/TOT. ASSETS	-0.094	-0.175
	(0.000)***	(0.000)***
VC DUMMY	-0.233	-0.119
	(0.080)*	(0.078)*
UW DUMMY	-0.026	-0.024
	(0.091)*	(0.089)*
GRANDSTANDING	0.270	0.235
	(0.023)**	(0.050)**
SPINNING	0.248	0.260
	(0.030)**	(0.021)**
FINANCIAL DUMMY	-0.202	-0.218
	(0.001)***	(0.000)***
SHARE OVERHANG	0.323	
	(0.163)	
MATURITY INDEX		0.008
		(0.045)**
Constant	0.298	0.351
	(0.000)***	(0.000)***
Adj R^2	0.165	0.170
Number of Observations	463	463

This table contains a further development of the basic model on the pre-crisis period (2004-2007). In Column 1 the model includes the *share overhang* variable, calculated as the ratio between shares retained by VC funds/total shares issued, while in Column 2 the model is tested again introducing the *Maturity Index* that is calculated as the age multiplied by the ratio Sales/Total Assets. P-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% levels respectively.

Table 10

Regression results of the basic model in the post-crisis period (2008-2010)

Dependant variable: UNDERPRICING.		
	1	2
AGE	-0.009	-0.008
	(0.295)	(0.336)
MONEY RAISED/TOT. ASSETS	-0.056	-0.047
	(0.538)	(0.617)
SALES/TOT. ASSETS	-0.022	-0.011
	(0.771)	(0.888)
VC DUMMY	0.194	0.033
	(0.134)	(0.880)
UW DUMMY	0.081	0.065
	(0.319)	(0.465)
FINANCIAL DUMMY	-0.051	-0.046
	(0.018)**	(0.019)**
GRANDSTANDING		0.177
		(0.441)
SPINNING		0.100
		(0.658)
CONSTANT	0.119	0.107
	(0.272)	(0.343)
Adj R^2	0.062	0.030
Number of Observations	44	44

This table measures the underpricing of IPOs on the AIM UK during the post-crisis period (2008-2010) in an OLS regression framework. Column 1 contains the results of the basic model when a dummy on IPOs belonging to the financial sectors (financial dummy) is introduced whereas Column 2 extends the results of the model by introducing dummies for grandstanding and spinning. P-values are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, 10% levels respectively.

APPENDIX 1.

Sample industries (2004-2010)

This Table contains the main descriptive data for the sectors of the sample companies during the period 2004-2010. It provides the absolute and relative numbers of VC backed companies, the average underpricing and the average VC backed underpricing per sector.

Sector	N. Obs.	VC Backed companies	VC Backed companies (%)	Avg. Underpricing	Avg. VC Backed Underpricing
Alternative Energy	5	4	80.00%	15.70%	19.63%
Automobiles	2	0	0.00%	0.65%	0.00%
Banks	2	0	0.00%	-1.50%	0.00%
Chemicals	14	12	85.71%	27.12%	32.13%
Construction	8	0	0.00%	-1.39%	0.00%
Electricity	2	0	0.00%	13.75%	0.00%
Electronic	8	3	37.50%	24.95%	34.72%
Engineering	3	0	0.00%	11.26%	0.00%
Equity Inv. Instruments	26	0	0.00%	-4.68%	0.00%
Food Producers	11	2	18.18%	14.01%	72.62%
Forestry & Paper	1	0	0.00%	-11.82%	0.00%
Gas & Water	1	1	100.00%	0.00%	0.00%
General Financial	48	0	0.00%	1.40%	0.00%
General Retailers	9	3	33.33%	15.07%	32.71%
Health & Health Care	12	6	50.00%	31.75%	70.56%
Household goods	3	0	0.00%	13.04%	0.00%
Industrial	16	4	25.00%	2.50%	12.68%
IT	13	5	38.46%	30.08%	40.37%
Insurance	1	0	0.00%	1.14%	0.00%
Investment Companies	1	0	0.00%	2.00%	0.00%
Leisure Goods	3	0	0.00%	19.61%	0.00%
Leisure & Hotels	4	0	0.00%	-9.03%	0.00%
Media	28	5	17.86%	12.17%	23.73%
Mining	59	7	11.86%	24.12%	21.68%
Mobile	3	2	66.67%	1.26%	1.89%
Non Equity Instruments	1	0	0.00%	-14.31%	0.00%
Non-life insurance	4	0	0.00%	-3.22%	0.00%
Oil&Gas	44	8	18.18%	28.60%	28.84%
Personal Goods	1	0	0.00%	7.46%	0.00%
Pharma & Biotech	16	14	87.50%	57.74%	68.41%
Real Estate	37	0	0.00%	3.51%	0.00%
Software & Computers	39	14	35.90%	11.21%	18.30%
Specialty and other finance	26	1	3.85%	21.71%	80.00%
Support Services	42	7	16.67%	7.46%	22.29%
Telecom Services	3	1	33.33%	3.22%	20.00%
Travel & Leisure	10	0	0.00%	2.35%	0.00%
Utilities - Other	1	0	0.00%	-16.00%	0.00%

APPENDIX 2.

Grandstanding and spinning by sector (2004-2010)

This table contains the percentage of grandstanded IPOs, IPOs with a prestigious underwriter and the VC backed IPOs with a prestigious underwriter filtered for the sectors of the sample companies during the period 2004-10.

Sector	Grandstanded IPOs (%)	Prestigious UW IPOs (%)	VC Backed IPOs with prestigious UW(%)
Alternative Energy	100.00%	20.00%	25.00%
Automobiles	0.00%	0.00%	0.00%
Banks	0.00%	50.00%	0.00%
Chemicals	75.00%	42.86%	41.67%
Construction	0.00%	62.50%	0.00%
Electricity	0.00%	0.00%	0.00%
Electronic	66.67%	37.50%	66.67%
Engineering	0.00%	66.67%	0.00%
Equity Inv. Instruments	0.00%	42.31%	0.00%
Food Producers	100.00%	36.36%	100.00%
Forestry & Paper	0.00%	100.00%	0.00%
Gas & Water	0.00%	0.00%	0.00%
General Financial	0.00%	27.08%	0.00%
General Retailers	66.67%	66.67%	66.67%
Health & Health Care	33.33%	58.33%	66.67%
Household goods	0.00%	33.33%	0.00%
Industrial	50.00%	37.50%	50.00%
IT	100.00%	46.15%	100.00%
Insurance	0.00%	100.00%	0.00%
Investment Companies	0.00%	100.00%	0.00%
Leisure Goods	0.00%	33.33%	0.00%
Leisure & Hotels	0.00%	0.00%	0.00%
Media	100.00%	57.14%	40.00%
Mining	71.43%	42.37%	42.86%
Mobile	0.00%	33.33%	50.00%
Non Equity Instruments	0.00%	0.00%	0.00%
Non-life insurance	0.00%	25.00%	0.00%
Oil&Gas	75.00%	38.64%	37.50%
Personal Goods	0.00%	100.00%	0.00%
Pharma & Biotech	85.71%	50.00%	57.14%
Real Estate	0.00%	62.16%	0.00%
Software & Computers	78.57%	48.72%	42.86%
Specialty and other finance	100.00%	53.85%	0.00%
Support Services	71.43%	30.95%	28.57%
Telecom Services	100.00%	66.67%	100.00%
Travel & Leisure	0.00%	60.00%	0.00%
Utilities - Other	0.00%	100.00%	0.00%