

Do Venture Capitalists Certify and Monitor New Issues?

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[Abstract]

This paper explores the signalling and monitoring effects of venture capital (VC) backing on performance of IPOs in France. IPOs where VCs are affiliated to lead underwriters (i.e., affiliated VCs) have lower underpricing than both non affiliated VC-backed IPOs and non-VC backed IPOs. Similarly, affiliated VC-backed IPOs have higher earnings surprise and market performance at the end of the one year period following the IPO date. There is an inverted U-shape relationship between VCs' retained equity and both underpricing and earnings surprise. Our analysis of IPO performance indicates that underwriters enhance effective screening, certification and monitoring roles of their "captive" VCs.

Key Words : Venture Capital, Initial Public Offerings, performance.

EFM : 210; 230; 810

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Introduction

Although the development of the venture capital industry over the last decade was driven by an increasing demand for finance specifically aimed at small and medium enterprises, it was also driven by a growing need for a third-party, certifying agent that may reduce *ex ante* information asymmetries between managers and investors at the time of IPOs. Because of their relatively long-term involvement with entrepreneurial ventures, VCs also act as monitors who ensure a continuous alignment of the interests of managers and external shareholders (Lee and Wahal, 2003).

Previous studies of the certification and monitoring roles of venture capitalists at the time of IPOs focus on their effects on initial underpricing and post-IPO performance, but show mixed results. Megginson and Weiss (1991) find lower initial returns for venture backed IPOs. Hamao et al. (2000), however, find that venture backed IPOs are associated with a higher initial return, whereas Barry et al. (1990) show no significant difference between VC-backed and non-VC backed IPOs. In their study of private to public MBOs in the UK, Jelic et al. (2004) find that VC-backed MBOs seem to be more underpriced than MBOs without venture capital backing. Similarly, Jain and Kini (1995) show that US VC-backed IPOs have a higher operating performance than non-VC backed IPOs over a three year period following the IPO date. Rinderman (2003) analyses 303 IPOs in the French *Nouveau Marché*, the German *Neuer Markt*, and the British *techMARK* from 1996 to 1999, and finds weak evidence that venture-backing has positive effects on both the operating and market performance of portfolio firms. While Brav and Gompers (1997) find that VC-backed IPOs out-perform non-VC backed IPOs

in the US markets¹, Hamao et al. (2000) find that long-term performance of Japanese venture-backed IPOs is no better than that of other IPOs.

Within this framework, Gompers and Lerner (1998) and Hamao et al. (2000) predict that conflicts of interest between underwriters and investors in those IPOs where the VC firms backing the offering are also related to the underwriter, may result in a worsening of the long-term performance. Espenlaub et al. (1999) show that initial return is lower for IPOs underwritten by more prestigious investment banks, whereas it is higher when VCs are related to the underwriters.

This paper explores the relationships between the roles of VCs and their effect on short- and long-term performance of IPOs in France. It argues that the certification (*ex ante*) and monitoring (*ex post*) roles of VCs may provide a solution to the underpricing problem, and may lead to more accurate information disclosure of earnings-per-share expectations. Therefore, this paper complements previous studies by suggesting that VCs' certification and monitoring roles should lead to (1) lower initial return during the first days of trading, and (2) positive long-term abnormal return and earnings surprise at the end of the first year following the IPO.

The contributions of this paper are two-fold. First, in addition to short- and long-term abnormal returns, this paper considers earnings surprise in post-IPO periods. Earnings surprise compares the actual earnings to the investment bank's earnings-per-share (EPS) expectations disclosed during the pre-IPO period. The paper argues that VCs have the incentive and ability to monitor managers of their portfolio firms to obtain actual earnings that are higher than expected earnings at the time of IPO, i.e. positive forecast errors.

Second, this paper contributes to discussions on the governance roles of VCs in different country environments. La Porta et al. (1997, and 1998) argue that agency problems exist in many diverse forms, and VCs in a particular economy may not play the same roles given country-specific differences in the nature and severity of agency problems. Jelic et al. (2004) indicate that notable differences between countries may give rise to differences in findings concerning IPOs. In contrast to the US, European private equity markets are dominated by captive firms, i.e., those that are subsidiaries of banks, insurance companies and other savings institutions (Jelic et al., 2004; Li and Masulis, 2003). These institutions may have different time horizons for investing (Jelic et al., 2004) or different objectives compared to other investors in the IPO (Hamao et al., 2000). By focusing on institutional characteristics of the French venture capital market, the second largest European market after the UK in terms of investment (EVCA, 2003), this paper extends prior research on the governance effects of VCs and underwriters. Unlike the mature IPO market in the USA, where there is a clear institutional separation between investment banks and the VC industry that is dominated by independent limited partnerships (Black and Gilson, 1998, Gompers and Lerner, 1999), in countries with relatively “young” IPO markets, such as France, the roles of the underwriter and VC firm are often performed by major investment banks and their affiliated private equity arms. Moreover, while VCs in the USA often invest in their portfolio firms at early stages of their development, VC firms are usually later-stage investors in France and other European countries, and they prefer to get involved with firms that have already developed and started marketing their products (Espinlaub et al., 2001; Jeng and Wells, 2000). As a result, these firms may have other financing opportunities, and a higher bargaining power with regard to VCs. One may thus expect relatively lower certification and monitoring effects of VC ownership and reputational concerns in France compared to the US.

Therefore, this study attempts to answer the following questions:

- Do VCs certify *ex ante* quality of an issue by reducing the underpricing of VC- backed IPOs?
- Do they perform an *ex post* monitoring function that generates positive earnings surprise and long-term abnormal return at the end of the first year after flotation?
- Do underwriters have a conflict of interest with IPO investors in issues that are backed by captive VCs?

This paper uses data on 138 firms that have been floated on the French market during the period of 1996-2000, for which information on VC investment and earnings expectations was found. It shows a non-linear relationship between underpricing and VCs' retained ownership. At lower levels of VC ownership a positive relationship between these two variables is driven by conflicts of interest. However, the certification effect dominates this relationship at higher levels of VC ownership, and it becomes negative. The maximum underpricing occurs when VC ownership amounts to 34.48%.

The paper's analysis of VC monitoring effects on long-run performance is based on earnings surprise and long-term stock price performance. Our empirical results show that earnings surprise of VC-backed IPOs is significantly higher than for non VC- backed IPOs ($p=10\%$), whereas the one-year period "buy-and-hold-average-return" (BHAR) is not significantly different. Moreover, earnings surprise has a non-linear relationship with VCs' retained ownership. Earnings surprise first increases and then decreases when VC's ownership reaches the level of 50%. This suggests that at low levels, an increase in VC's ownership improves

incentives to monitor and restrain managerial opportunism. However, wealth maximization strategy at high levels of share ownership may tempt VCs to release over-optimistic information at the time of IPO. Finally, contrary to prior research, our study shows that affiliated VC-backed IPOs may benefit from more effective screening and certification effects at the time of IPO (e.g., a low initial return), and more effective *ex post* monitoring effects (e.g., a higher long-run abnormal performance, and earnings surprise). This suggests that there are differences in the effects of VCs and underwriters on IPO performance in different national and institutional context environments (Jelic et al., 2004).

The paper is organized as follows. The second section presents a review of the literature on the roles of venture capitalists at the time of IPOs and develops testable hypotheses. The third section describes the data and provides summary statistics with regard to VC share ownership, and short- and long-term IPO performance. Section four discusses empirical results related to the certification and monitoring roles of VCs. Section five provides conclusions and outlines future research.

2. Literature Review and Hypotheses

Previous studies have investigated the roles of VCs in the price discovery process at the time of IPO. They generally argue that VCs may reduce the information asymmetry at the time of the issue, and have a value-enhancing effect. Depending on their ownership, VCs may have the incentive to be involved in the decision-making process and to exert a significant influence on management before and after flotation. Therefore, VCs have a dual role as a third-party, certifying agent and as a monitor of issuing firms. Both these roles should have an

impact on the IPO short- and long-term performance. In the following sections we extend this theoretical framework and suggest a number of testable hypotheses.

2.1. Certification Role of VCs and Underpricing

Previous research suggests that relatively high quality firms may try to attract VCs because VC involvement may serve as a signal of high quality that other, poor quality firms are not able to imitate. Since VC involvement causes dilution of initial owners' holdings, and therefore creates a misalignment of incentives in issuing firms, VCs design contracts that aim to reduce information asymmetry and maximize disclosure of private knowledge by the initial owners-managers. Initial owners are also enforced to disclose their private information as some VCs have managerial redemption rights that allow them to re-sell their stake if certain milestones are not met. Although VCs may have an incentive to mis-represent and overprice the issue, this overpricing may reduce the proceeds from subsequent share sales and damage their reputation. Gompers (1995), for example, reports that VCs have a compounded annual return of 60% on investment when they exit through the IPO, and 15% return on their investment in trade sales. Therefore, VCs are aware that losing reputation in the IPO market would reduce their returns.

In addition, a substantial number of VC-backed IPOs involve syndication of investment, which is an important and widespread part of the venture capital industry (EVCA, 2003). Each syndicate usually contains a lead firm and one or more non-lead firms, with an individual venture capital firm playing both roles over time depending on the particular deal. The higher the number of VCs involved in the IPO, the more accurate the information disclosure at the time of flotation should be.

A growing number of studies provide an empirical verification of the links between VC involvement and IPO performance, but the results are ambiguous. For example, in their analysis of US IPOs during the period of 1978-1987, Barry et al. (1990) find a negative association between underpricing on the one hand, and ownership and the number of VC backers of the IPO firm on the other. Megginson and Weiss (1991) provide empirical support to the certification hypothesis, and find that VC-backed IPOs over the period of 1983-1987 were significantly less underpriced than non-VC backed IPOs. However, contrary to Megginson and Weiss (1991), Francis and Hasan (2000) show a higher underpricing for VC-backed IPOs. Gompers (1996) emphasises a potential conflict of interests between VC firms and the IPO. He shows that young VCs grandstand, i.e. they take firms public earlier than more established firms, in order to raise their profile in the market and attract capital in future rounds.

This ambiguity in empirical findings may be explained by a possible trade-off between incentives and rent-seeking effects associated with VC share ownership. Previous research has recognized several possible governance roles for large-block shareholders, some of which are likely to be value-enhancing while others are likely to have negative effects. A fast growing literature on optimal ownership structures of firms depending on the levels of 'private benefits of control' (e.g., Grossman and Hart, 1988; Harris and Raviv, 1988) suggests that large-block shareholders may abuse their power and try to extract a control premium at the expense of other shareholders. At low levels of ownership, opportunistic VCs may be tempted to float their portfolio firms earlier and/or at a substantial discount, and, therefore, underprice the issue. However, building on Jensen and Meckling's (1976) analysis of the incentive effect of concentrated entrepreneurial ownership on the consumption of perquisites, Shleifer and

Wolfenzon (2002) suggest that the greater the concentration of cash-flow rights in the hands of large-block shareholders, the greater are the incentives not to behave opportunistically. Therefore, high equity stakes by VC firms may align their interests with that of the IPO firm, thus reducing the initial underpricing level.

Building on these research perspectives, we suggest the following hypotheses:

Hypothesis 1.1: VC-Backed IPOs in general, and VC-syndicated IPOs in particular, have lower initial underpricing than non VC-backed IPOs.

Hypothesis 1.2: There is a curvilinear (an inverted U-shape) relationship between underpricing and retained share ownership of VCs.

Extending the certification framework, issuing firms may reduce the agency costs associated with information asymmetry by selecting more experienced and ‘prestigious’ underwriters (Beatty and Ritter, 1986; Booth and Smith, 1986; Carter and Manaster, 1990). However, another potential source of agency costs is associated with the dual role of the underwriter. Whereas the underwriters have typically only one business transaction with the firm, they have long-standing relationships with their clients (Filatotchev and Bishop, 2002). The balance between these two opposite incentives depends not only on the bank’s reputation, but also on the bargaining power of the issuer and outside investors (Beatty and Ritter, 1986).

The impact of underwriters on IPO performance becomes even more ambiguous when underwriters have an *ex ante* equity investment in the firm through their VC arms or “captive” VC firms. The limited longevity of the syndicated investments may create agency problems

associated with opportunistic behavior of underwriter-VC, information asymmetries and other aspects of what has become known in the agency research literature as the “principal-principal” relationship (Young et al., 2002) as opposed to the conventional principal-agent problem.

Extending this framework, Gompers and Lerner (1998), and Hamao et al (2000) argue that prior underwriter’s venture investment may create conflict of interests with IPO investors who anticipate that the underwriter has an incentive to set a high offer price. IPO investors will therefore require a higher risk premium, increasing the initial underpricing level.

The underwriters’ involvement in the venture capital industry, however, provides superior access to issuer information, which may lead to a more accurate disclosure policy, reducing the asymmetric information between issuers, underwriters and investors, and thus the initial underpricing. This is more likely when VC-related underwriters have reputation-related incentives not to underprice the issue. Ljungqvist and Wilhelm (2003) argue that “if underpricing is in part caused by an agency conflict, it is not surprising that it should be lower when investment banks are shareholders and so when interests are better aligned”. In their study of U.S. IPOs during the Internet boom, they provide empirical evidence that VC and investment bank investments reduce underpricing. Li and Masulis (2003) show similar results for venture capital investments by lead underwriters in the German IPOs market during the period of 1997-2001. Therefore, we suggest:

Hypothesis 1.3: Underpricing is lower for issues where the lead underwriter is a parent of the VCs involved in the IPO.

2.2. Monitoring Role of VCs and IPO Performance

Brav and Gompers (1997) argue that VCs perform a number of crucial strategic functions such as management advice and assistance, which help firms to perform better in the long run. Megginson and Weiss (1991) indicate that venture capitalists continue to be involved in issuing firms' projects even after IPOs. This long-term involvement of VCs is expected to have a positive influence on firms' post-issue operating and market performance. VCs also gain a detailed knowledge and substantial decision-making rights in firms that they finance (Lerner, 1994). In particular, VC firms impose contractual restraints on managerial discretion, including the use of staged investment, an enforceable nexus of security covenants, and the option to replace the entrepreneur as manager unless key investment objectives are met (see Megginson and Weiss, 1991, for a discussion).

This research suggests that VC involvement in the IPO should have positive effects on the long-term performance of IPOs. More specifically, the *ex post* monitoring role of VCs should be reflected not only in share price dynamics, but also in the earnings forecast's accuracy. Using a sample of 456 IPOs between 1989 and 1994 on the NASDAQ, NYSE and AMEX, Doukas and Gounenc (2000) show that VC backed IPOs have better market performance than non-VC backed IPOs. Van Frederikslut and Van der Geest (2000) provide similar findings in their study of IPOs on the Amsterdam Stock Exchange during the period of 1985-1998. In line with previous studies, we suggest:

Hypothesis 2.1a: VC-Backed IPOs have a higher earnings surprise than non VC-backed IPOs.

Hypothesis 2.1b: VC-Backed IPOs have a higher long-term buy-and-hold abnormal return than non-VC backed IPOs.

However, the relationship between the *ex ante* certification and the *ex post* monitoring roles of venture capitalists depends on their shareholdings. In this framework, VCs with low shareholdings may not be able to have access to accurate information or to offer effective monitoring. As long as VCs are unable to compensate for the relative loss of control at the IPO by strengthening other corporate governance mechanisms, such as board independence (Black and Gilson, 1998), an effective combination of *ex ante* certification and *ex post* monitoring roles for low VCs shareholdings is highly problematic. Therefore, an increase in VCs' retained equity should be positively associated with long-term performance. However, VCs with high shareholdings may be tempted to produce optimistic earnings forecasts in order to maximize firms' value at the time of IPO. This is likely to reduce the effectiveness of the *ex post* monitoring as measured by the post-IPO performance. Consequently, there may be an optimal level of shareholdings where VCs are able to obtain accurate information, and to offer an effective combination of *ex ante* certification and *ex post* monitoring increasing the post-IPO earnings surprise and market performance². Hence:

Hypothesis 2.2a: There is a curvilinear (an inverted U-shape) relationship between earnings surprise and retained share ownership of VCs.

Hypothesis 2.2b: There is a curvilinear (an inverted U-shape) relationship between the long-term BHAR and retained share ownership of VCs.

Gompers and Lerner (1998) and Hamao et al (2000) suggest that the adverse effect of unexpected conflicts of interests between IPO investors and VC-related underwriters will result in a lower long-term return, as investors will realise their initial mistake and adjust their valuation accordingly. They predict that companies where the adverse effects of self-interested underwriters on IPO pricing are not fully anticipated at the time of offerings will have a lower long-term performance, whereas IPOs where the effects are fully anticipated and incorporated in the immediate post-IPO share price, should not have long-term underperformance, at least compared to other IPOs. However, they recognize that more prestigious underwriters may value their reputation and compensate for the adverse effects of these conflicts of interest by truthfully certifying and screening issues. Espenlaub et al. (1999) find a higher long-run return for UK IPOs backed by VCs affiliates than IPOs underwritten by independent investment banks, but only if those affiliates are not employed as the actual IPO sponsors. Rindermann (2003) investigates the impact of venture capitalists on the operating and market performance of IPOs in France, Germany, and UK, and shows a significant positive impact of “captive” VCs on market performance in France. While prior research associates analysts’ optimism with agency problems (e.g., Dugar and Nathan, 1995, Lin and McNichols, 1995, Michaely and Womack 1996) or extrapolation of past performance (e.g., Lakonishok et al., 1994), reputational considerations may limit the conflicts of interest between VC backers and IPO investors, reducing over-optimism of disclosed expected earnings and valuation multiples at the time of IPOs. Therefore, if underwriter-associated VCs are involved in the post-IPO period, one may expect that alignment of interests will lead to conservative earnings expectations at the IPO date. It should also encourage effective monitoring that increases both post-IPO earnings surprise and market performance. The study of the relation between the *ex ante* certification and the *ex post* monitoring roles should control for the affiliation between VCs and lead underwriters. Therefore, we suggest:

Hypothesis 2.3a: Earnings surprise is higher for issues where the lead underwriter is a parent of the VCs involved in the IPO.

Hypothesis 2.3b: Long-term BHAR is higher for issues where the lead underwriter is a parent of the VCs involved in the IPO.

3. Data and Research Methodology

The database includes 138 of the 335 French companies that went public over the period 1996 to 2000. These IPOs are firms for whom data on both venture capital investment and expected earnings was found. Venture capital ownerships are obtained in preliminary prospectuses, whereas the expected earnings over a one-year period following the IPO date (EPS^e_1) are obtained from pre-research notes produced by the lead-underwriter during the pre-IPO period³. These IPOs typically have a one-year lock-in agreement with VC firms. The database does not show any significant differences in short- and long-term abnormal returns with a control sample of 138 IPOs floated during the same period that was selected on the basis of firms' size.

Short- and long-term abnormal returns have been calculated with respect to the SBF 250 French index. This benchmark, which includes the 250 most representative firms traded on the French market, does not include IPOs from our sample and, therefore, it does not suffer from the bias identified by Loughran and Ritter (2000).

To verify our hypotheses 1.1, 1.2 and 1.3 we use the following linear expression:

$$AR = a + b_1. NbVC + b_2. \%VC + b_3. URank + b_4. LeadVC + b_5. Hi-tech + b_6. M.Momentum + b_7. M.Volatility + b_8. \Delta EPS^e_{1,0} + e \quad (1)$$

where the dependent variable is the initial underpricing (AR), i.e. the initial abnormal return adjusted by the SBF 250 market index return. The explanatory variables include the number of VCs in the issuing firm ($NbVC$), the post-IPO VC ownership in percentage terms ($\%VC$), the underwriter ranking ($URank$), a dummy variable indicating whether the VC is affiliated to the lead underwriter of the issue ($LeadVC$), a dummy variable for the industry membership equal to 1 if high-tech, zero otherwise ($Hi-tech$), market conditions in terms of market momentum, ($M.Momentum$) and market volatility ($M.Volatility$) calculated over a three months period prior to the IPO date, and, finally, the expected change in earnings-per-share ($\Delta EPS^e_{1,0}$), calculated as the percentage change with regard to the actual earnings during the year preceding the IPO, i.e. $\Delta EPS^e_{1,0} = (EPS^e_1 - EPS_0) / EPS_0$.

To measure the forecast accuracy, we compare the one-year expected earnings to actual earnings (EPS_1), and calculate the earnings surprise (ES_1) observed at the end of the first year following the IPO date. The earnings surprise (ES_1) is equal to the difference, in percentage terms, between actual earnings (EPS_1) and expected earnings (EPS^e_1) for the end of the first year period, where $ES_1 = (EPS_1 - EPS^e_1) / EPS^e_1$. As with the initial underpricing, the regression of earnings surprise is as follows:

$$ES_1 = a + b_1. NbVC + b_2. \%VC + b_3. URank + b_4. LeadVC + b_5. Hi-tech + b_6. \Delta EPS_{-1,0} + b_7. \Delta EPS^e_{1,0} + e \quad (2)$$

Equation (2) adds the changes in earnings per share over the year period prior to the IPO date, ($\Delta EPS_{-1,0}$), to control for the extrapolation of past performance hypothesis (Lakonishok, Shleifer and Vishny, 1994), where $\Delta EPS_{-1,0} = (EPS_0 - EPS_{-1})/EPS_{-1}$.

Finally, to test hypotheses 2.1b, 2.2b, and 2.3b related to market performance, we use the following expression:

$$BHAR_t = a + b_1. NbVC + b_2. \%VC + b_3. URank + b_4. LeadVC + b_5. Hi-tech + b_6. P/B + b_7. \Delta EPS_{-1,0}^e + b_8. ES_t + e \quad (3)$$

Where, $BHAR_t$ is the one-year buy-and-hold abnormal return adjusted by the SBF 250 market index return. In addition to previous explanatory variables, we assume the long-run abnormal return to be positively related to the surprise effect, i.e. the aftermarket performance is a response to new information about true earnings perspectives. Consistent with prior evidence in Fama and French (1993) and Lakonishok et al. (1994), equation (3) controls for the price-to-book effect. Firms with a low price-to-book ratio are supposed to earn higher returns.

4. Results

4.1. Descriptive Statistics

The descriptive statistics in different tables below provides information separately for the total sample: VC-backed IPOs, affiliated VC-backed IPOs, and non-VC backed IPOs. T-tests are used to compare firms in sub-samples.

Panel A in Table 1 indicates that 63% of firms in the sample belong to the hi-tech industry, with similar percentages of hi-tech companies in both the VC and non-VC backed IPOs sub-samples.

Consistent with Barry et al. (1990), Panel B in Table 1 indicates that VC-backed IPOs typically involve three venture capitalists. Interestingly, there is a significantly higher number of VCs involved in firms where one of the venture capitalists is an affiliate of the underwriters (5.35 on average). Table 1 also shows that VC backed IPOs are not significantly overvalued, and do not have better growth opportunities in terms of the offer price-to-book ratio compared to non-VC backed IPOs. However, VCs appear to raise larger amounts of funding since VC-backed IPOs have a significantly higher percentage of outstanding shares compared to non-VC backed IPOs ($p=10\%$).

In this study, the underwriters are ranked from more prestigious (rank 1) to less prestigious (rank 3) on the basis of their dynamic cumulative market share over the study period⁴. A significantly lower average rank of the underwriters of VC backed IPOs suggests that firms with VC investments choose more prestigious underwriters to manage the offering. Consistent with Barry et al. (1990) VC-backed IPOs are floated with the help of more reputable underwriters. While VC-backed IPOs go public following a period of positive market momentum compared to non VC-backed IPOs, they have a significantly lower price revision.

Table 1 near here

Results in Table 2 indicate that VCs' equity stake on average accounts for 30.2% of initial shares. It falls to 19.30% at the time of IPO, as VCs sell 22.1% of their pre-IPO shares⁵. As announced in preliminary prospectuses, VCs keep their shares over the first year period, and their equity stake remains stable over this time period.

VCs' shareholdings are not significantly different with regard to whether they are associated with the lead underwriter of the offering or not. Interestingly, the percentage of shares sold by VCs at the time of IPOs is significantly ($p=10\%$) higher for issues where a VC firm is related to the lead underwriter. When VCs sell a higher amount of shares, they choose to manage issues in order to make the offering successful.

Table 2 near here

Consistent with previous studies of French IPOs (e.g., Chahine, 2002;2003), Panel A in Table 3 indicates an average first day abnormal return of 19.3%. It is positively skewed when compared to its median value of 9.4%. Further empirical analyses use the 4th day buy-and-hold abnormal return, BHAR, as a proxy for the underpricing. Although empirical investigations using the first day abnormal return exhibit virtually identical results, significant daily abnormal returns for days one through four suggest a partial stock price adjustment during the first days of trading, and justify the use of the 4th day BHAR⁶. As Table 3 shows, the 4th day BHAR is equal to 23.4% on average (a median value of 7.4%).

Following Lyon and Barber (1999), Panel B includes the results for the long-term post-IPO performance calculated using the buy-and-hold abnormal return. It shows a significantly positive first year BHAR ($p=10\%$), equal to 38.2% on average. However, the median value of

-25.3% suggests that, except for some issues, that are mainly associated with the Internet boom in the 1999, IPOs tend to underperform the SBF250 market index.

Despite the potential conflict of interests, Panel A shows a significantly lower initial underpricing for IPOs backed by VC affiliates of underwriters, than both non-affiliated VC-backed and non-VC backed IPOs (at the 5% and 1% levels respectively). Contrary to Baron (1982), this finding suggests that investment bankers do not take advantage of their superior market conditions, and provide more effective screening and certification of the issue's quality. Panel B in Table 3 shows that while affiliated VC-backed IPOs have a higher long-term performance than non-affiliated VC backed IPOs, they do not significantly out-perform non-VC backed IPOs. This suggests a less effective monitoring role of independent VCs.

Table 3 near here

Consistent with Fama (1998), Table 4 shows significantly positive changes in the percentage of the EPS over the one year period prior to the IPO date for the entire sample. Firms tend to go public following a sharp increase in their performance as measured by the changes in EPS ($\Delta EPS_{-1,0}$), where $\Delta EPS_{-1,0} = (EPS_0 - EPS_{-1}) / EPS_{-1}$. Although non-VC backed IPOs have a higher average EPS compared to VC-backed IPOs over the year prior to the flotation, the difference between these groups is insignificant. This may be explained by the skewed nature of the $\Delta EPS_{-1,0}$ associated with the decision of some non-VC backed IPOs to go public after a highly profitable year.

Non-VC backed IPOs have a strongly positive and higher change in the one-year expected earnings per share $\Delta EPS^e_{-1,0}$ compared to VC backed IPOs. This is mainly related to non-

affiliated VC-backed firms that have significantly lower expected earnings than affiliated VC-backed IPOs. One explanation is that non-affiliated VC-backed IPOs tend to disclose more conservative forecasts than other groups. However, the negative and significant earnings surprise (ES_1) for VC-backed IPOs, together with the insignificantly different from zero ES_1 for affiliated VC-backed IPOs, suggest that non-affiliated VC-backed IPOs have a significantly negative ES_1 . This implies that non-affiliated VCs may have lower incentives to disclose optimistic forecasts at the IPO date, and they do not provide effective monitoring that leads to a positive post-IPO performance. At the same time, non-VC backed IPOs disclose optimistic forecasts, and have a negative earnings surprise.

Although with negative median value, the earning surprise for firms whose lead underwriter is related to VCs is positive, but not significantly different from zero. This is consistent with the assumption that issues where VCs are related to underwriters are more effectively monitored, and they benefit from management support that minimizes the forecast error.

Table 4 near here

Results in Table 4 suggest that venture capitalists act as (1) a third party certifying agent who ensures disclosure of more accurate information at the time of IPOs, and (2) a monitor who provides management support to the IPO firm in order to obtain a positive earnings surprise compared to the expected figures disclosed at the time of IPOs.

4.2. Regression Results

A- The Initial Underpricing and the Certification Role of VCs

Table 5 includes regressions (1) to (3) of the initial underpricing that contain VC investments characteristics and other commonly used determinants.

Table 5 near here

Contrary to hypothesis 1.1, model (1) does not show any significant linear effect of VC investment characteristics, such as ownership and the extent of syndication, on underpricing. As predicted by hypothesis 1.3, this model provides a negative relationship between the initial underpricing and the dummy variable that indicates that the VC is related to the lead underwriter. In contrast with prior research in the USA by Gompers and Lerner (1998), Japan by Hamao et al. (2000), and Germany by Klein and Zoeller (2001), results in Table 5 provide support to the signalling hypothesis and show that affiliated VC-backed IPOs have lower underpricing than non-VC-backed IPOs. Lower underpricing of IPOs where the lead underwriter is related to one of the VCs investing in the firm suggests that the certification effect dominates the conflict of interest effect. VCs have a third party certification role when managing the offering.

Consistent with previous studies, model (1) shows that initial underpricing is positively related to price revision, *Price Adj.*, within the price range in the pre-IPO period, and is negatively related to market volatility, *M.Volatility*. Moreover, initial underpricing is negatively and significantly related to the expected change in earnings per share over the first year period ($p=5\%$). The risk premium required by investors is higher for firms with lower earnings expectations disclosed at the time of IPOs.

Model (2) controls for the hypothesised non-linear relationship between underpricing and post-IPO venture capital ownerships, and clearly shows that underpricing first increases and then decreases with the equity holding of venture capitalists. This is consistent with hypothesis 1.2, and suggests that conflict of interest dominates the relationship between venture capitalists and investors at lower levels of VC shareholding, whereas the certification effect dominates this relationship at higher levels. The maximum underpricing is obtained at 34.48% of VC ownership. Figure 1 indicates the existence of an optimal percentage of VC ownership beyond which VCs act as certifying agents who reduce the *ex ante* uncertainty level.

Figure 1 near here

Model (3) controls for the differences in impact on underpricing of expected earnings changes for VC- and non-VC backed IPOs, using a dummy variable Vc equal to 1 if VC-backed IPOs, zero otherwise. The model's results indicate that initial underpricing is negatively associated with the expected earnings changes for the entire sample whereas the negative change in slope of expected earnings changes of VC backed IPOs is insignificant. While initial underpricing decreases in expected earnings for non-VC backed IPOs, it is less sensitive to earnings expectations for VC-backed issues

Overall, results in Table 5 provide some evidence of the signalling effect of captive VCs on initial underpricing. Further empirical tests may help to verify the expected monitoring role of VCs and answer the following questions: Does VC participation in issuing firms provide more accurate earnings per share expectations at the time of issue? Does it generate a higher

long-term abnormal return? Does the affiliation between VCs and underwriters generates a better monitoring in the post-IPO period?

B- Post-IPO performance and the monitoring role of VCs

The Accuracy of Earnings Forecasts in VC-Backed Issues

Regressions in Table 6 explore the monitoring effect of VC investment characteristics on earnings surprise over a one-year period following the IPO date.

Table 6 near here

Model (4) represents the regression results for earnings surprise as the dependent variable on VC-related variables only. This model shows no evidence of possible links between earnings surprise and the number of venture capitalists. As suggested by hypothesis 2.2a, it indicates a non-linear relationship between the earnings surprise and the level of retained VC ownership. Figure 5 clearly shows that there is an optimal level of VC ownership (50%) where the earnings surprise reaches a maximum. At this level, VCs certify issuing firms' quality and release accurate forecasts. They also provide management support and monitoring in line with other investors' interests.

Figure 2 near here

Model (5) adds variables related to underwriter characteristics and to the effect of the expected earnings at the time of IPOs. In line with hypothesis 2.3a, it provides evidence of a

positive and significant relationship between VC-affiliated underwriters and earnings surprise ($p=10\%$). There is a negative and significant association between earnings surprise and the underwriter ranking ($p=1\%$). This indicates that a higher earnings surprise is achieved for offerings underwritten by more prestigious investment banks. More prestigious underwriters disclose a more conservative expected EPS, leading to higher actual earnings, and thus generating a positive earnings surprise at the end of the first year period following the IPO date. Moreover, model (5) shows that the earnings surprise is negatively related to the hi-tech dummy variable. Negative relationship between the earnings surprise and expected earnings at the time of offerings suggests that more optimistic issuing firms have a lower earnings surprise.

Model (6) explores the differential effect of expected earnings-per-share changes of VC-backed IPOs on earnings surprise, using the Vc dummy variable defined previously in model (3). Model (6) confirms the negative and significant relationship between the earnings surprise and the expected earnings changes for the entire sample, whereas the slope of the relationship for VC-backed IPOs is not significant. One explanation is that the negative relation between earnings surprise and expected earnings changes is mainly related to non-VC backed IPOs. Non-VC backed IPOs with a lower (higher) expected earnings have a higher (lower) earnings surprise at the end of the first year period, and they seem to disclose less accurate information than VC backed IPOs. Again, model (6) shows a positive and significant effect of the affiliation of VCs to lead-underwriters ($p=10\%$).

The Long-term Stock Price Performance of VC-backed Issues

In line with previous research, regressions in Table 7 complement previous models and use the one-year period post-IPO stock price performance as a proxy for the monitoring effect of VCs. Models (7) to (9) include regressions of the one-year buy-and-hold abnormal returns on venture capital investment characteristics, earnings expectations and earnings surprise, in addition to traditional control variables that are related to the firm's characteristics such as industry membership and price-to-book ratio.

Model (7) shows a negative and significant intercept term. Consistent with previous studies on French IPOs (e.g., Chahine, 2004), this suggests a negative BHAR over the first year following the IPO date. The regression results do not provide evidence of a relationship between the BHAR and the number of venture capitalists. Similarly, there is no evidence of a significant relationship between IPO performance and VC's retained ownership, and hypotheses 2.1b and 2.2b are not supported⁷. In contrast to Espenlaub et al. (1999), an increase in the number of venture capitalists does not lead to a higher monitoring effect. Consistent with hypothesis 2.3b, VC- backed IPOs with a lead underwriter affiliated to VCs have higher long-run abnormal performance. Moreover, market performance is positively associated with earnings surprise. In contrast with prior research, market performance is also positively related to the price-to-book ratio. This suggests that companies with growth potential approximated by their price-to-book-ratio have a higher long-run abnormal return following their IPOs.

However, the regression results in model (7) may suffer from a potential bias related to the association between earnings surprise and venture capital characteristics. To check the robustness of our analysis, model (8) controls for a simultaneous relationship between the buy-and-hold abnormal return and the earnings surprise that may be related to the venture

capitalists characteristics. Using the results in model (5) in Table 6 as the first stage of the 2SLS regression improves the explanatory power of the model and confirms a positive and significant effect of the earnings surprise on buy-and-hold abnormal return. These findings also confirm our assumption that IPOs whose VC backers are related to their underwriters have more effective monitoring and management support that leads to a higher post-IPO stock price performance (see hypothesis 2.3b). Model (9) controls for possible differences in impact of the expected earnings-per-share changes and the earnings surprise on the first year BHAR for VC- and non-VC backed firms. It shows that post-IPO performance (1) is negatively related to the expected earnings-per-share for the entire sample, and (2) is positively related to expected earnings-per-share changes for the VC-backed IPOs. While the long-run market performance adjusts to (not accurate) expected earnings of non-VC backed IPOs, it is positively associated with expected earnings of VC-backed IPOs. Moreover, post-IPO performance is positively related to changes in the slope of earnings surprise due to VC-backed IPOs. Consistent with Espenlaub et al. (1999), the results in models (9) and (10) indicate a possible alignment of interest between VCs and investors, especially in issues where the lead underwriter is a parent of VCs involved in the IPO.

4.3. Sensitivity Analyses

The Calculation of Long-Run Market Performance

Recent studies suggest that long-run performance of IPOs is sensitive to the valuation method (Loughran and Ritter 1995, Lyon et al., 1999). To verify the robustness of our results, we calculated the value weighted short- and long-run market performance. This showed that the value-weighted 4th day BHAR is equal to 32.69% for VC-backed IPOs. It was insignificantly

different from the 4th day value-weighted BHAR of 23.41% for non-VC backed IPOs. Affiliated VC-backed IPOs had a significantly lower average abnormal return of 6.88% compared to both non-affiliated VC-backed IPOs and non-VC backed IPOs ($p=5\%$). Moreover, VC-backed IPOs had the one-year value-weighted BHAR of 0.00% (the median value of -15.02%). It was insignificantly different from the non-VC backed IPOs average abnormal return of 31.62% (the median value of -8.79%). IPOs that were backed by underwriter-related VCs had the average abnormal return of 67.53% (the median value of 3.03%), significantly higher than the abnormal return of non-affiliated VC-backed IPOs ($p=5\%$). Overall, our original results still hold when we use the average value-weighted abnormal returns. Affiliated VCs provide more effective certification and monitoring roles. Independent VCs do not have effective certification and monitoring roles. Further investigations using the Fama and French (1993) three-factor asset pricing model provided similar results.

The Underwriter Reputation

As the dynamic cumulative market share over the study period of 1996-2000 may not be a robust proxy of underwriter reputation, we calculated the underwriters' market share over the period of 1990-1995 for 55 IPOs obtained from Thomson One Banker. Although some new investment banks have joined the underwriting industry in France in the late nineties (see Chahine, 2003), the ranking of banks operating in the early nineties did not change. Using the underwriter ranking based on the 1990-1995 data in the regressions for short- and long-run performance did not provide significant differences with our original results⁸. More prestigious underwriters managed more underpriced issues, and these issues had a higher

earnings surprise. This confirms the robustness of the choice of dynamic cumulative market share as a metric for underwriter reputation.

Moreover, in the regressions for the short- and long-run performance we considered the choice of the underwriter as an exogenous variable. This implies that VC do not choose underwriter as a quality signal of the issuing firm. To verify the robustness of these results, we also controlled for a simultaneous relationship between the underwriter ranking and the number of venture capitalists in the issuing firm. However, this did not produce any significant changes in our results.

Long-Run Effects of Affiliated versus Non-affiliated VCs

Since expected earnings in preliminary prospectuses are mainly disclosed for a one-year period following the IPO, our empirical analysis of VC effects on the long-run performance focus on one-year period following the IPO date. When we excluded the earnings surprise from our analysis and ran regressions for two- and three-year abnormal returns, this confirmed the positive and significant BHAR for VC-backed IPOs where the VC is an affiliate of the lead underwriter ($p=10\%$).

5. Discussion and Conclusions

This paper analyses 138 French IPO firms that went public between 1996 and 2000. It focuses on the signalling and monitoring effects of VCs and it also explores possible effects of underwriters' involvement in the venture capital industry.

We found that affiliated VC- backed IPOs have lower underpricing than both non-affiliated VC-backed and non VC-backed IPOs. There is a non-linear relationship between underpricing and post-IPO VC ownership, where the underpricing first increases, and then decreases with VC ownership. This is consistent with the assumption that conflicts of interest dominate this relationship first, and it is dominated by a certification effect when VC ownership is higher than 34.48%. Furthermore, while there is no evidence of significant differences in the one-year period BHAR between VC- and non VC- backed IPOs, our results suggest that the earnings surprise should be used to verify the monitoring effect of venture capital investments. Within this framework, earnings surprise first increases and then decreases as VCs ownership reaches the level of 50%. At this level, VCs certify issuing firms' quality and allow the establishment of accurate forecasts.

The non-linear relationship between EPS and VC share ownership may be explained by a possible trade-off between the VCs' incentives to monitor and a temptation to release over-optimistic information at the time of IPO. Agency research suggests that large-block holders play a critical leadership and monitoring role. They have both the incentives and the means to restrain the self-serving behaviour of managers (Maug, 1998; Shleifer and Vishny, 1986). Therefore, changes in EPS should be positively associated with VC ownership. However, VC backers of IPOs with high levels of equity stake may be tempted to disclose over-optimistic information at the time of IPOs in order to maximize the offer price. At the same time, both self-interested and more reputable underwriters would manage less optimistic issues in order to protect their reputational capital. These effects are consistent with the negative, although insignificant, relationship between underpricing and expected changes in EPS for VC backed IPOs (Model 3 in Table 5). These findings combined suggest that VCs with a relatively high equity stake are more concerned with their wealth maximization at the time of IPOs, whereas

underwriters are mainly driven by their long-term reputational considerations. While VCs provide more optimistic EPS, the latter group reveals more conservative EPS at the time of IPO.

Interestingly, our results suggest the existence of an optimal level of VCs holdings within the range of 34.48% and 50%, where firms going public may benefit from a combination of effective screening and certification (e.g., a low initial return) and *ex post* monitoring (e.g., positive earnings surprise). This ownership range seems to create a unique overlap of *ex ante* and *ex post* positive effects of VCs' involvement in the IPO, and future research should explore possible implications of this "window of opportunity" further.

Our results related to the involvement of underwriters in the venture capital industry in the French IPO market were rather surprising. Contrary to previous studies, we discovered that there is a significantly higher number of VCs in those IPOs where one of the VCs is an affiliate of the lead underwriter. These IPOs have a higher quality in terms of lower underpricing, higher earnings surprise and long-term abnormal return when compared to the rest of the sample. These IPOs are also managed by more reputable underwriters. These findings point to the effective certification and monitoring roles of underwriters-VCs that create benefits for the issuers, who maximise their proceeds; and long-term investors, who obtain benefits from improved long-term performance. Since our sample includes issues with a one-year lock-in period, VC-underwriters seem to have an interest in building and maintaining their reputation in the IPO-market.

These arguments are consistent with a number of empirical findings in previous research. For example, Jelic et al. (2004) in their study of flotations of UK MBOs suggest that VCs that are

subsidiaries of larger financial organisations have a lower pressure to grandstand in order to raise further funds than independent VCs. They may be under less pressure to engage in underpricing and may have the incentive to consider the long-term performance of the MBO. Evidence from the US suggests that commercial bank-affiliated VCs act more like reorganizers than screeners (Cantillo and Wright, 2000). Finally, Hellman et al (2003) in their analysis of the US venture capital industry find that commercial banks are more likely to invest in later stage, less risky ventures, similar to a widespread practice in France.

In conclusion, our focus on the French IPO market helps to further extend previous research on the roles of VC backers of IPOs that has to date been predominantly developed in the US/UK context. This paper sheds new light on the possible agency effects of VC affiliation with other financial institutions, such as investment banks, which is a common practice in many European countries (Jeng and Wells, 2000). It also raises new questions with regard to the roles of VC industry in growing and less mature markets, such as France, as third-party certifying agents, financiers and monitors.

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Table 1
Distribution and Characteristics of VC backed and non-VC backed IPOs

The sample includes 138 IPOs in the *Nouveau Marché* (NM) and the *Second Marché* (SM) during the period of 1996-2000. Descriptive statistics are presented for the full sample, VC-backed IPOs and non-VC-backed IPOs. The Table also provides statistics for VC-backed IPOs where one of the venture capitalists is an affiliate of the underwriters. Panel A contains distribution of firms in terms of their industry membership (hi-tech vs. non-hi-tech). Panel B provides statistics on the number of venture capitalists (*NbVC*) per issuing firm, *Hi-Tech Dummy*, that is equal 1 for hi-tech firms and zero otherwise. It also includes market capitalization (*Size*) calculated at the offer price in millions of euros, the offer price-to-book ratio (*OP/B*), the percentage of offered shares (*Outstanding Shares*), and the underwriter reputation (*URank*), ranked from 1 to 3, with 1 being more prestigious underwriter. *M.Momentum* and *M.Volatility* are the SBF 250 Buy-and-Hold return and daily standard deviation calculated over a 3-month period prior to the IPO date. Finally, Price Adj. is the price revision during the pre-IPO period. It is calculated based on the mid-point of the initial price range in book-building procedures. The last columns show T-test results for differences between (a) affiliated VCs, where one of the VC is an affiliate of the lead underwriter, and non-affiliated VCs, (b) VC-backed and non-VC backed IPOs, and (c) affiliated VCs and non-VC backed IPOs.

Panel A : Industry Distribution of VC vs non-VC backed IPOs

Industry membership	Total	VC	non - VC
Hi-tech	87	47	40
Non-hi-tech	51	25	26
Total Number	138	72	66

Panel B : Characteristics of VC backed and non VC backed IPOs

Variable	Total		VC backed IPOs (1)		if VC = Lead Underwriter (2)		Non-VC backed IPOs (3)		T- Difference in Mean (bilateral) vs. Non-Aff. (1-3) (2-3)		
	Mean (std-dev)	Median	Mean (std-dev)	Median	Mean (std-dev)	Median	Mean (std-dev)	Median			
NbVC	1.971 (3.035)	1.000	3.778 (3.294)	3.000	5.350 (4.534)	4.000			***		
Hi-tech Dummy	0.630 (0.484)	1.000	0.653 (0.479)	1.000	0.550 (0.510)	1.000	0.606 (0.492)	1.000	....	....	....
Size (in M€)	79.839 (111.35)	37.719	88.038 (107.59)	48.777	71.475 (60.388)	46.972	70.894 (115.48)	32.729	....	....	....
OP/B	15.076 (17.035)	8.476	13.625 (16.216)	7.555	13.806 (16.726)	7.994	16.660 (17.875)	9.923	....	....	....
Outstanding Shares	0.266 (0.126)	0.251	0.282 (0.129)	0.272	0.294 (0.101)	0.292	0.248 (0.121)	0.237	....	*	*
URank	2.072 (0.893)	2.000	1,931 (0.909)	2.000	1.750 (0.910)	1.000	2.227 (0.856)	2.500	*	**	**
M.Momentum	0.118 (0.137)	0.085	0.132 (0.117)	0.094	0.150 (0.108)	0.158	0.102 (0.156)	0.082	....	*	....
M.Volatility	0.013 (0.004)	0.012	0.013 (0.004)	0.012	0.013 (0.003)	0.012	0.013 (0.004)	0.012	....	....	....
Price Adj.	0.032 (0.067)	0.042	0.023 (0.065)	0.036	0.020 (0.052)	0.032	0.042 (0.069)	0.047	....	*	....

(1): Aff. vs. Non-Aff. provides comparisons between VC-affiliated underwriters and non-VC-affiliated underwriters. ***, **, * : significant at the 1%, 5%, and 10% level respectively.

Table 2
Involvement of different types of VCs

This table provides VCs' equity stake before and after the IPO date for VC backed IPOs and for VCs who are affiliates of the lead underwriters. It also shows the amount of sold shares as the percentage of pre-IPO shareholding.

Shareholding	before		after		Sold Shares (in % of pre-IPO shareholding)	
	Mean (std-dev)	Median	Mean (std-dev)	Median	Mean (std-dev)	Median
VC	0.302 (0.231)	0.251	0.193 (0.157)	0.170	0.221 (0.274)	0.128
when VC=Lead Underwriter	0.324 (0.162)	0.317	0.207 (0.125)	0.178	0.244 (0.302)	0.202

Table 3
Stock Price Performance

The sample includes 138 IPOs in the *Nouveau Marché* (NM) and the *Second Marché* (SM) over the period of 1996-2000. Descriptive statistics are presented for the full sample, VC-backed IPOs and non-VC-backed IPOs. The Table also provides statistics for VC-backed IPOs where one of the venture capitalists is an affiliate of the lead underwriter. In addition to the 1st day abnormal return, Panel A includes the 4th, 10th and 60th day Buy-and-Hold Abnormal Returns (BHAR). Abnormal returns are adjusted by the SBF 250 market index return. Panel B includes the BHAR over one, two, and three year periods based on the closing price of the 4th day of trading. The last columns show T-test results for differences between (a) affiliated VCs, where one of the VC is an affiliate of the lead underwriter, and non-affiliated VCs, (b) VC-backed and non-VC backed IPOs, and (c) affiliated VCs and non-VC backed IPOs.

Variable	Total		VC backed IPOs (1)		if VC = Lead Underwriter (2)		Non-VC backed IPOs (3)		T- Difference in Mean vs. Non-Aff.		
	Mean (std-dev)	Median	Mean (std-dev)	Median	Mean (std-dev)	Median	Mean (std-dev)	Median	Aff. (1-3)	(2-3)	(2-3)
Panel A - Initial Underpricing											
AR 1 st day	0.193*** (0.329)	0.094	0.189*** (0.387)	0.077	0.034 (0.095)	0.032	0.198*** (0.256)	0.112	**	.....	***
BHAR 4 th day	0.234*** (0.419)	0.074	0.233*** (0.464)	0.047	0.063 (0.209)	0.006	0.236*** (0.369)	0.140	**	.....	**
BHAR 10 th day	0.251*** (0.539)	0.079	0.232*** (0.576)	0.019	0.083 (0.259)	0.019	0.272*** (0.499)	0.183	*	.....	**
BHAR 60 th day	0.324*** (0.999)	0.122	0.312** (0.975)	0.055	0.023 (0.045)	0.017	0.338** (1.035)	0.157	.....	.....	.....
Panel B- Post IPO Performance (Based on the closing price of the 4th day of trading)											
BHAR 1 st Year	0.382* (2.319)	-0.253	0.235 (1.803)	-0.265	1.050 (3.017)	0.078	0.542 (2.781)	-0.236	**	.....	.....
BHAR 2 nd Year	0.4185 (3.666)	-0.516	0.333 (3.098)	-0.524	1.975 (5.830)	-0.453	0.509 (4.211)	-0.479	**	.....	.....
BHAR 3 rd Year	-0.116 (2.111)	-0.465	-0.258 (1.293)	-0.462	0.525 (2.150)	-0.083	0.029 (2.716)	-0.468	**	.....	.....

***, **, * : significant at the 1%, 5%, and 10% level respectively.

(1): Aff. vs. Non-Aff. provides comparisons between VC-affiliated underwriters and non-VC-affiliated underwriters.

Table 4
Earnings Changes and Forecast Accuracy

This table includes (1) changes in earnings-per-share, EPS, over the one year period prior to the IPO date ($\Delta EPS_{-1,0}$), (2) expected changes in EPS over the one-year period following the IPO date ($\Delta EPS_{1,0}^e$), and (3) the earnings surprise (ES_1) that is equal to the percentage difference between actual earnings (EPS_1) and expected earnings (EPS_1^e) for the end of the first year period following the IPO date. The last columns show T-test results for differences between (a) affiliated VCs, where one of the VC is an affiliate of the lead underwriter, and non-affiliated VCs, (b) VC-backed and non-VC backed IPOs, and (c) affiliated VCs and non-VC backed IPOs.

Variable	Total		VC backed IPOs (1)		if VC = Lead Underwriter (2)		Non-VC backed IPOs (3)		T- Difference in Mean (bilateral) Aff. (1-3) (2-3) vs. Non-Aff. ⁽¹⁾		
	Mean (std-dev)	Median	Mean (std-dev)	Median	Mean (std-dev)	Median	Mean (std-dev)	Median			
$\Delta EPS_{-1,0}$ (%)	0.491*** (2.096)	0.361	0.284 (2.272)	0.322	0.316 (1.646)	0.234	0.717*** (1.877)	0.365	---	---	---
$\Delta EPS_{1,0}^e$ (%)	0.488** (2.447)	0.501	0.124 (2.193)	0.374	0.806** (1.446)	0.449	0.884*** (2.657)	0.544	*	**	---
ES_1 (%)	-0.595*** (1.062)	-0.606	-0.441*** (1.094)	-0.512	0.054 (1.499)	-0.209	-0.763*** (1.006)	-0.684	**	*	***

***, **, * : significant at the 1%, 5%, and 10% level respectively.

(1): Aff. vs. Non-Aff. provides comparisons between VC-affiliated underwriters and non-VC-affiliated underwriters.

Previous changes in earnings-per-share: $\Delta EPS_{-1,0}(\%) = [EPS_0 - EPS_{-1}] / EPS_{-1}$

Expected changes in earnings-per-share: $\Delta EPS_{1,0}^e(\%) = [EPS_1^e - EPS_0] / EPS_0$

Earnings Surprise: $ES_1(\%) = [EPS_1 - EPS_1^e] / EPS_1^e$

Table 5
Underpricing and the Certification role of Venture Capitalists

This table presents the OLS regression results for Initial Underpricing, i.e. the 4th day BHAR, as the dependent variable and VC investments characteristics, firm characteristics, and earnings expectations as the regressors. Model (3) controls for the differences in impact of the expected earnings changes for VC- versus non-VC backed IPOs using a dummy variable Vc that is equal to 1 if VC-backed IPOs, zero otherwise. White Heteroskedasticity-Consistent-Standard Errors are in parenthesis.

	Underpricing Model (1) OLS	Underpricing Model (2) OLS	Underpricing Model (3) OLS
Intercept	0.418*** (0.119)	0.429*** (0.121)	0.428*** (0.121)
<i>Venture Capital Investments</i>			
NbVC	-0.009 (0.011)	-0.012 (0.009)	-0.011 (0.009)
Ownership (%)	0.016 (0.175)	0.560* (0.298)	0.548* (0.294)
Ownership ² (%)		-0.846** (0.329)	-0.817** (0.323)
URank	-0.041* (0.023)	-0.045* (0.023)	-0.042* (0.023)
If Und=VC	-0.120** (0.056)	-0.152*** (0.058)	-0.141** (0.058)
<i>Firms Characteristics</i>			
Hi-tech Dummy	0.048 (0.046)	0.036 (0.044)	0.035 (0.044)
Price Adj.	0.795** (0.326)	0.781** (0.321)	0.747** (0.320)
M.Momentum	0.145 (0.166)	0.133 (0.162)	0.129 (0.159)
M.Volatility	-14.818** (6.853)	-15.442** (6.767)	-16.075** (6.843)
<i>Earnings Expectations</i>			
$\Delta EPS^e_{1,0}$	-0.021** (0.009)	-0.018** (0.008)	-0.010** (0.004)
$\Delta EPS^e_{1,0} * Vc$			-0.018 (0.020)
Adjusted R ²	0.158	0.181	0.181
F-statistic	3.861	4.018	3.745
Prob(F-statistic)	0.000	0.000	0.000

***, **, * : significant at the 1%, 5%, and 10% level respectively.

Figure 1

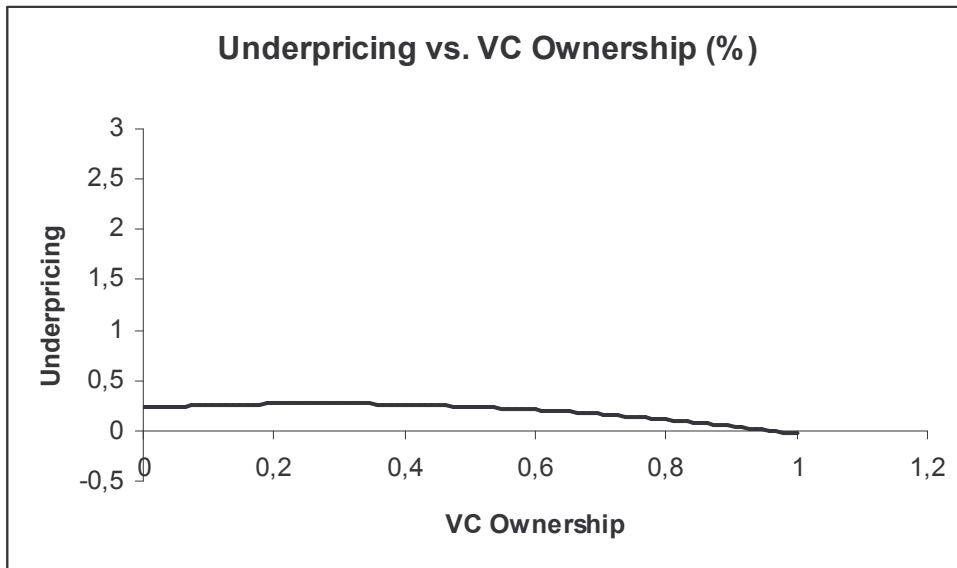


Table 6
Post-IPO Performance and the Monitoring Role of Venture Capitalists

This table presents the OLS regressions results for earnings surprise, defined as the percentage of predicted EPS over the first year following the IPO date, as the dependent variable, and VC investments characteristics, firm characteristics, and earnings expectations as the regressors. Model (6) controls for differences in impact of the expected earnings changes for VC- versus non-VC backed IPOs using a dummy variable Vc that is equal to 1 if VC-backed IPOs, zero otherwise. White Heteroskedasticity-Consistent-Standard Errors are in parenthesis.

Variable	ES ₁ Model (4) OLS	ES ₁ Model (5) OLS	ES ₁ Model (6) OLS
Intercept	-0.787*** (0.112)	0.065 (0.246)	0.077 (0.249)
<i>Venture Capital Investments</i>			
NbVC	0.010 (0.042)	-0.015 (0.050)	-0.017 (0.051)
Ownership (%)	2.327* (1.317)	1.815* (1.048)	1.793* (1.029)
Ownership ² (%)	-2.544* (1.478)	-1.938* (1.142)	-1.891* (1.092)
URank		-0.241*** (0.087)	-0.244*** (0.088)
If Und=VC		0.633* (0.363)	0.616* (0.359)
<i>Firms Characteristics</i>			
Hi-tech Dummy		-0.366** (0.163)	-0.363** (0.163)
$\Delta EPS_{-1,0}$		-0.619 (1.074)	-0.628 (1.077)
<i>Earnings Expectations</i>			
$\Delta EPS^e_{1,0}$		-0.098*** (0.028)	-0.108*** (0.023)
$\Delta EPS^e_{1,0} * Vc$			0.026 (0.059)
Adj.R-squared	0.029	0.135	0.129
F-statistic	2.347	3.676	3.259
Prob(F-statistic)	0.076	0.001	0.001

***, **, * : significant at the 1%, 5%, and 10% level respectively.

Figure 2

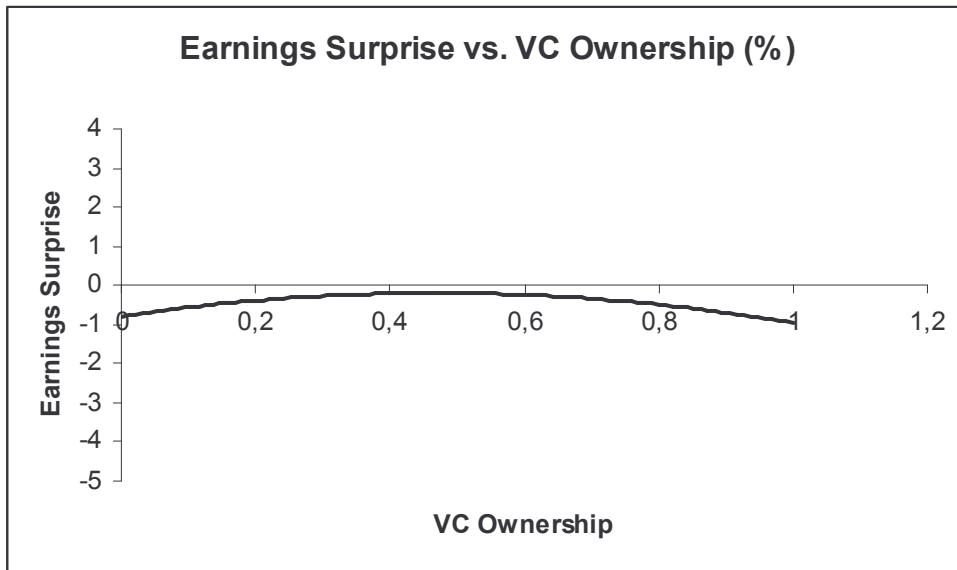


Table 7
One Year Buy-and Hold Abnormal Returns and the Monitoring Role of Venture Capitalists

This table presents the regressions results for the one year Buy-and-hold Abnormal return as the dependent variable, and VC investments characteristics, firm characteristics, and earnings expectations as the regressors. The 2SLS regression in models (8) and (9) uses the results of the model (5) in Table 6, i.e. the Earnings Surprise regression, as a first stage. Model (9) controls for the differences in impact of (1) the expected earnings changes for VC- versus non-VC backed IPOs using a dummy variable Vc that is equal to 1 if VC-backed IPOs, zero otherwise. White Heteroskedasticity-Consistent-Standard Errors are in parenthesis.

Variable	BHAR1 Model (7) OLS	BHAR1 Model (8) 2SLS	BHAR1 Model (9) 2SLS
Intercept	-0.410* (0.230)	-0.415* (0.234)	-0.346 (0.234)
<i>Venture Capital Investments</i>			
NbVC	-0.019 (0.035)	-0.022 (0.035)	-0.028 (0.035)
Ownership (%)	-1.918 (1.261)	-1.295 (1.329)	-1.061 (1.269)
Ownership ² (%)	2.662 (1.654)	1.432 (1.805)	1.261 (1.759)
URank	-0.024 (0.091)	-0.069 (0.086)	-0.078 (0.086)
If Und=VC	0.628** (0.253)	0.717*** (0.262)	0.592** (0.249)
<i>Firms Characteristics</i>			
Hi-tech Dummy	0.191 (0.162)	0.106 (0.158)	0.124 (0.157)
OP/B	0.019*** (0.005)	0.019*** (0.005)	0.019*** (0.005)
<i>Earnings Expectations</i>			
$\Delta EPS_{1,0}^e$	0.031 (0.042)	-0.061 (0.059)	-0.082** (0.041)
$\Delta EPS_{1,0}^e * Vc$			0.138*** (0.045)
Earnings Surprise ES ₁	0.191** (0.088)	0.141*** (0.075)	0.084 (0.069)
ES ₁ *Vc			0.124* (0.073)
<hr/>			
Adjusted R-squared	0.158	0.146	0.163
F-statistic	3.844	3.586	3.409
Prob(F-statistic)	0.000	0.000	0.000

***, **, * : significant at the 1%, 5%, and 10% level respectively.

¹ Brav and Gompers (1997) find that non-VC backed IPOs have a significant long-term underperformance, whereas VC-backed IPOs do not show any significant underperformance. However, they indicate that, while VC-backed IPOs out-perform non-VC backed IPOs on the basis of equally weighted returns, the difference is significantly reduced when the value-weighted returns are used.

² Although there is some debate when and how VCs add value, monitoring and guidance by VCs are the most often mentioned in the literature (see Jelic et al., 2004, for an extended discussion).

³ Despite many similarities between IPO mechanisms in France and US, there are some structural differences in the marketing processes. Jenkinson and Jones (2002) note that European IPOs are accompanied by pre-deal research that is prepared by analysts from “syndicate” banks, while in the US such research is not generally published.

⁴ The dynamic cumulative underwriter's market share is defined as the euro value of all shares underwritten by the bank since 1996 divided by the total euro value of all IPOs over the same period on the *Second* and *Nouveau Marché*. The relative market share for the 1999, for example, is calculated over the period of 1996-1999. On the basis of this ranking, the top 5 underwriters are ranked 1, the 6th to the 10th underwriters are ranked 2, with the remaining underwriters being ranked 3. The underwriter ranking is calculated on a yearly basis.

⁵ This is much higher than results in Lin and Smith (1998), and this suggests that VCs in France are more likely to remain involved in management of the firm after the IPO date.

⁶ This is consistent with Chahine (2002) who finds significant abnormal return for days one through to day three for a sample of 305 IPOs from January 1996 to December 2000 on the French *Second Marché* and *Nouveau Marché*.

⁷ Although not mentioned in Tables 6 and 7, there is no evidence of a linear relationship between IPO performance (either operating or market performance) and VC shareholdings.

⁸ The sample of 56 IPOs represents 60% of non financial IPOs listed in Euronext data base over the period of 1990-1995. The results of our study show that large banks such as BNP, Credit Lyonnais and Société Générale are the top tier underwriters during the period of 1996-2000. Moreover, our ranking of foreign banks is consistent with prior research in the US. Over the late 1990s, more reputable foreign banks such as HSBC and Merrill Lynch have managed a number of large issues which placed them in the top tier categories.