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ABSTRACT

This study examines the extent to which principal-principal agency conflicts within venture capital (VC) syndicates lead to additional principal-agent conflicts in IPO firms in two institutional contexts. Using a matched sample of 274 VC-backed IPOs in the US and the UK, it shows that the diversity of a VC syndicate increases pre-IPO discretionary current accruals, used as a proxy for earnings management, but the impact of such diversity is higher in the US. There is also evidence of higher underpricing and lower aftermarket performance in firms with higher earnings management and VC diversity, and these negative performance effects are also higher in the US. Our findings indicate that local and informal institutions have a significant effect on multiple agency conflicts in IPO firms and performance outcomes.

Keywords: earnings management, initial public offerings, venture capital, conflicts of interest, institutions

JEL: G14; G32; M41

1. Introduction

We have recently witnessed the emergence of an active class of private equity investors, venture capital (VC) firms, who invest in privately held firms with a successful business model and take them public. However, the governance roles of VCs and their impact on performance during and after an initial public offering (IPO) are not well understood. More specifically, there is very little research on multiple agency problems associated with VC syndicates, e.g. VC backing of an IPO firm that involves two or more venture capitalists. In this paper we seek to not only understand how diversity among VCs in a syndicate might influence various performance indicators at the time of the IPO, but also how these effects may depend on institutional environments surrounding an IPO.

Prior research grounded within an agency framework documents that issuers frequently manage their earnings around the IPO (Teoh et al., 1998a; 1998b) since they are motivated to improve the short-term performance of their firms when approaching the IPO. Accordingly, they may exercise some accounting discretion when the opportunity is present. This opportunity also reflects the existence of a principal-agent conflict of interest between the insiders and public market investors. A number of researchers argue that managers' discretion is affected by the presence of VC firms (Cummings et al., 2007). VCs usually screen their portfolio companies and prepare them to go public. As sophisticated investors, they employ an extensive set of covenants to protect their investments (Barry et al., 1990), and their active involvement in portfolio companies is likely to deter earnings management and strengthen the corporate governance of their firms (Morsfield and Tan, 2006; Brau and Johnson, 2009). However, venture capital firms are subject to different pressures from their limited partners (Bruton et al., 2010) and, as syndicate members, they have different objectives which can result in principal-principal

conflicts of interests among members of a VC syndicate, and thus adversely affect the quality of the monitoring of their portfolio companies (Hochberg et al., 2007). Some syndicate members are likely to encourage earnings management which is consistent with the grandstanding hypothesis (Gompers, 1996). Although previous studies have explored separate effects of principal-agent and principal-principal conflicts on performance of VC-backed IPOs, there has been no analysis of inter-dependencies between these two types of agency relationships and their combined impact on IPO performance.

In addition, while VC incentives can impact their portfolio firms, recent research is beginning to recognize the importance of contextual issues in VC investments. More specifically, the institutional environment in a particular country can have a significant impact on governance and firm valuation (Banerjee et al., 2011; La Porta et al., 2002). For example, VC investors in the UK operate within a closer network economy where "relationship" governance is underpinned by extensive networking and trust considerations that may mitigate opportunism within VC syndicates. In contrast, although VC syndicates in the US network based on trusted relationships in an industry rife with potential asymmetric information, there is an incentive to develop more extensive networks to identify and source new potential venture ideas, which requires more distant relationship in both industry and geography (Sorenson and Stuart, 2008). Although this diversity is also found in the UK among VC syndicates, the informal institutional relationship mechanism we note in the UK VC industry is lacking in the US as syndicate diversity increases. The informal networks and voluntary behavior codes in the UK capital market have allowed for the development of a 'gentlemanly capitalism' model that characterizes the intermingled economic, social, and political power centered geographically in the confines of the City of London (Cain and Hopkins, 1986). This concept is driven by voluntary normative behavior over

law, where agents (usually concentrated in a geographically small area that reinforces ties and social networks) act collectively to regulate affairs and develop norms and codes of practice. Such social ties and networks might help to overcome conflicts of interest and reduce goal incongruence among VCs within a networked syndicate (e.g., Jones et al., 1997).

The goal of this paper, therefore, is to bring together these two strands of agency research and examine the effects of goal incongruence among VC syndicate members on earnings management and performance of IPO firms. In our analysis of VC syndicates, we focus on the diversity of VCs within the syndicate. We consider this diversity as a potential source of principal-principal conflicts. We also examine the simultaneous effects of both types of agency problems on short- and long-term performance of IPO firms. Finally, our analysis explores how institutional differences between the US and UK can moderate complex inter-relationships among VC syndicate diversity, earnings management and IPO performance.

Combining finance research with an institutional perspective, we argue that the impact of the 'gentlemanly capitalism' in the UK and its associated informal institutional context strengthen the homogeneity of interests among VCs in any syndicate. This reduces the potential gains from principal-principal conflict and improves collective monitoring of managers within an IPO firm. As a result, VC-syndicated firms in the UK are less likely to realize any rent from conflicting principal-principal relationships and thus have weaker opportunities to manage their earnings at IPO than their US peers. Within this networked environment, the effects of a negative reputation on future relations for UK VCs will be stronger, and is thus likely to provide a safeguard against opportunistic behavior (Jones et al., 1997). This issue of reputational effects on earnings management in the IPO setting has been raised in the literature (e.g., Ball and Shivakumar, 2008), but has not been theoretically or empirically explored in previous research.

Our empirical results strongly support our arguments. More specifically, VC syndicate diversity is positively associated with earnings management in an IPO firm, and the effect is much stronger in the U.S. context. Both earnings management and syndicate diversity have a mutually enforcing and negative impact on IPO performance, and this performance decline is much worse among U.S. compared to U.K. IPOs.

2. Review of Literature

Although VCs often do not have detailed scientific knowledge about the specific technology in their portfolio firms, they are able to economize on their selection and monitoring costs by focusing their investments in certain industries. By specializing in these industries, they are able to develop a comparative advantage over other investors (Cumming et al., 2007). Additionally, their experience helps them to rapidly bring these ventures to a successful exit through an IPO and aids them in generating added value beyond the capital provided (Hsu, 2004). Successful VC experience is valuable in at least two ways. First, this experience leads to the development of a reputation for quality (Lerner 1994) which allows VCs to command a premium (i.e. more ownership for less capital extended) from future entrepreneurs (Hsu, 2004) and makes future investment fund-raising easier (Nahata, 2008). Second, the reputation for quality also helps VCs to certify the value of ventures (Megginson and Weiss, 1991).

The effects of these governance roles of VCs become particularly important in the context of potential manipulation of information provided to the public market investors by managers of IPO firms. Information asymmetry between insiders and outside investors offers managers the incentives and opportunity to engage in earnings management behavior to increase the attractiveness of the IPO for potential investors (Teoh et al., 1998a; 1998b). Prior research suggests that IPO firms often use income-increasing accruals in the most current statements of

the prospectus (DuCharme et al., 2001). This type of behavior is a typical manifestation of the principal-agent problem between IPO insiders and incoming public market investors. Given the importance of an experience-based reputation in the VC industry, VC firms may play a monitoring role which constrains opportunistic earnings management at IPO (Morsfield and Tan, 2006).

2.1 Effects of VC Syndicate Diversity on Earnings Management

Because VCs often syndicate their investments, however, the effect of any single VC firm on earnings management in an IPO may be uncertain (Lerner, 1994). Syndicates include diverse VC firms investing in a portfolio company. Sorenson and Stuart (2008) provide research which suggests that, while VCs prefer to syndicate with firms that are like themselves with similar industry experience, there is growing VC syndicate diversity, for example, due to fashion for certain types of deals (as an example one can mention the number of IPOs recently focused on social networks such as LinkedIn and the interest in a potential IPO for Facebook). Sorenson and Stuart (2008) also note that there is continual need to expand partner networks in order to gain access to future deals, and VC firms with broader networks obtain better financial returns (Hochberg et al., 2007). Moreover, Sorenson and Stuart (2008) argue that with large numbers of diverse members there are less potential reputation effects because it is harder to tell what a member's contribution to the network is; "the negative consequences of a social loafer for the outcome of a team-based initiative fall with the size of the team" (p. 273).

While syndication can help individual VCs to diversify firm-specific risks and benefit from potential synergies between their areas of expertise in screening and selection of investments, they may create an additional set of agency conflicts, especially at the IPO stage. For example, VC syndication leads to a less concentrated ownership and thus lower incentives

for individual syndicate members to monitor, thus resulting in potential free-riding behavior (Cumming, 2006). Diversity within the VC syndicate may also create high co-ordination costs that make collective monitoring of managerial discretion and timely response to managerial opportunism difficult. It may also increase costs related to coordination and timing difficulties regarding decision making (Cumming et al., 2007).

Syndication diversity also creates a situation where the individual interests among the VCs in the syndicate may diverge (Filatotchev et al., 2006) and where information asymmetries may result in potential conflicts of interest between lead and other syndicate members (Cumming, 2006). More specifically, while experienced VCs have a stronger reputation to protect and therefore are likely to discourage earnings management behavior, younger VC firms which have a "grandstanding" motive may encourage earnings management (Gompers, 1996). These VCs may collude with managers and encourage them to manipulate earnings in a run-up to the IPO. By bringing a venture to IPO sooner, these young VC firms can demonstrate their ability to deliver results, and they can speed the development of their own reputation. Earnings management by the IPO firm could help to successfully float the shares and may not have any deleterious effects for them as long as it did not impact their ability to successfully exit the investment at the expiration of the lockup period. The more diverse is the syndicate, the more difficult it would be for a lead VC to restrain potential opportunism not only of IPO insiders, but also of other syndicate members.

The diversity of VC firms involved in a VC syndicate could therefore lead to principal-principal conflicts of interest, offering a new opportunity for managers to use earnings management at the time of IPO. Therefore, we test whether principal-principal conflict of interest proxied by the diversity of the syndicate is associated with the principal-agent problem

proxied by earnings management behavior. We conjecture that in an IPO firm, the extent of EM is positively associated with VC syndicate diversity.

2.2 Earnings Management and Institutional Effects

Earlier we discussed the importance of the institutional context on governance outcomes. Even though the UK and the US both maintain a common law tradition (La Porta et al. 2002), the informal institutional context which arose over time in the UK within the VC industry is different from the US context. More specifically, Sorenson and Stuart (2001) emphasize the importance of geographic and industry spaces on information flows and investment decisions attributed to VC networks. UK venture capitalists are located within close proximity of each other in the City of London. They normally engage in later stage investments and buy-outs brokered within their network (Renneboog et al., 2007). Although VC networks are present in the US, these rather unique characteristics of the UK VC industry tend to create a unity of interests among VCs and make their intra-network reputation even more important for subsequent activities.

This investment system underpins the development of an informal type of reputation that is embedded in social networks with strong ties, such as the City of London. Networks may provide structural and/or relational safeguards against opportunistic behavior, because of the impact that a negative reputation can have on future relations. This unity of interests will therefore reduce the likelihood of significant principal-principal conflict. Without this conflict, monitoring and oversight should be relatively more effective among VCs in the UK syndicate compared to the US syndicate, and this should subsequently reduce the likelihood of a principal-agent problem associated with earnings management behavior. Although reputation effects are also likely to be prevalent in the US, it will be harder to discern who may be responsible for

these effects in a US VC syndicate because the same network effects do not apply given, for example, great geographic distances among VCs. In this situation, the UK institutional context can reduce principal-principal conflict and this should reduce principal-agent conflict. Therefore we hypothesize that the positive association between EM and VC diversity will be stronger in the US.

2.3 Syndicate Diversity, Earnings Management and IPO performance

Previous research indicates that IPO valuation is positively related to pre-IPO earnings (Purnanandam and Swaminathan, 2004). As shown by Sloan (1996), a failure to distinguish between the different properties of the accrual and cash flow components of earnings can result in stock mispricing. Given the significant information asymmetries between insiders and potential investors in the IPO process, the former have incentives to manage earnings opportunistically in the financial statements in the IPO prospectus.[1] This appears to be fairly effective in raising the valuation of the IPO, which is likely to trade at overvalued prices (DuCharme et al., 2001), and it is also likely to increase IPO underpricing (Zheng and Stangeland, 2007). However, as accounting accruals eventually reverse, poor-quality firms suffer from lower performance in the longer-term (Teoh et al., 1998b). Previous research shows that earnings management negatively affects performance (DuCharme et al., 2001; Teoh et al., 1998a, 1998b), and those IPOs with greater earnings management in the IPO year are more likely to delist and to do so sooner (Zhou et al., 2005).

In addition, principal-principal conflict, apart from influencing the principal-agent problem in earnings managements, may also have a direct negative effect on performance. Previous research on 'conflicting voices' (e.g, Hoskisson et al., 2002) indicates that diversity of

[1] Recent evidence in Ball and Shivakumar (2008) indicates that more than 40% of issuers exhibit positive discretionary accruals in the year prior to the IPO.

block-holders' interests and decision-making horizons may lead to goal incongruence among them which, in turn, may have a negative impact on the firm's value. In the IPO context, some VCs have an incentive to establish a longer-term relationship with a prestigious underwriter who helps them to bring portfolio companies to an IPO. In a diverse VC syndicate, it is likely that some members would have a long-term relationship with a specific underwriter while others in the syndicate would not. This creates a conflict of interests among syndicate members: VCs with a long-term relationship with the bank-underwriter may align their interests with the bank rather than with other members of the syndicate (Arthurs et al., 2008).

In sum, the two types of agency conflicts may be mutually re-enforcing, and greater syndicate diversity not only allows for increased potential principal-agent problems through weaker oversight and monitoring of IPO managers, but it also reduces the ability of the syndicate to align interests of its members. The two agency problems combined should have a negative effect on performance. Therefore we conjecture that VC syndication increases the negative impact of EM on performance. That is, the negative association between EM and performance will be stronger in IPOs with more diverse VC syndicates.

Finally, as we argued above, national institutions may have a significant moderating effect on the two aforementioned relationships. The UK network economy can reduce goal incongruence among VCs and, therefore, reduce the extent of principal-principal conflict. Moreover, as we previously argue, the impact of VC diversity on earnings management will also be lower in the UK. Ball and Shivakumar (2008), for example, provide evidence that earnings management in UK IPOs seems to be lower than in their US counterparts. On the other hand, US venture capital syndicates will suffer from stronger principal-principal conflict which will only exacerbate earnings management activity. This is especially true at the time of the IPO because

syndicate member have more allegiance to other syndicate members to pursue repeat IPO deals in the future than to the IPO firm which has become a short-term relationship subject only to a lockup period (Arthurs et al., 2008). As such, without the informal institutions found in the UK, the deleterious effects of this behavior will be worse for performance among those IPO firms listed in the US. Therefore we suggest that the negative association between EM and performance will be stronger in US IPO firms with more diverse VC syndicates.

3. Data and Methodology

3.1. Data Sources

To construct our sample, we use a multi-stage data collection procedure. We first compiled the list of all IPOs floated in the US, from Security Data Corporation (SDC) New Issues database, and in the UK, from the London Stock Exchange New Issues files, from 1996 to 2006. In line with prior research, we excluded de-mergers, corporate spin-offs, equity carve-outs, reverse take-over vehicles, and special purpose vehicles (SPVs), which do not usually have private equity backing. We excluded re-admissions and transfers from AIM to the main market, investment and acquisition vehicles and IPOs of unit and investment trusts that have very specific governance characteristics. Finally, we selected firms that have been backed by VC firms prior to their IPO.

In order to capture risk differences between US and UK IPOs and better examine their performance, we identified matched IPOs based on size (market capitalization) to reduce possible selection bias (Bruton et al., 2010), date of listing to control for market timing and conditions (Chahine et al., 2007), and industry membership, using the SIC 3-digit codes controls for possible clusters by industry in VC activity (Bruton et al., 2010). We concentrated our study on firms for which we were able to identify all the required accounting information to calculate

the quarterly discretionary current accruals immediately prior to IPO date from the Compustat Global database. This resulted in a final sample of 274 IPOs (matched sample of 137 firms from each country).

Our variables of interest come from information provided in the aforementioned databases and IPO listing prospectuses, which contain detailed information on insiders and early stage investors such as VCs.

3.2. Methodology

Prior research on earnings management concentrates on accounting accruals which represent the difference between reported earnings and cash flows from operations. Total accruals include both current and non-current (or long-term) accruals. While the current accruals would result from adjustments in short-term assets and liabilities of the firm, long-term accruals relate mainly to depreciation and equity income of unconsolidated subsidiaries which are not expected to affect taxable income. Managers are thus likely to have more discretion over current accruals, where they may for example advance the recognition of revenues and delay the recognition of expenses, than over long-term accruals (Teoh et al., 1998b). Current accruals include both non-discretionary current accruals determined by firms' economic fundamentals, and discretionary current accruals that are unrelated to fundamental factors. Earnings management has thus been usually proxied by discretionary current accruals (DCA), which are subject to manager discretion (Teoh et al., 1998a, 1998b). We first examined the association between pre-IPO discretionary current accruals (DCA_{-1}) and VC diversity. We then examined the effects of DCA_{-1} and VC diversity on IPO performance. More specifically, we estimated the following regression equations:

$$DCA_{-1} = \alpha + \beta_1 \, US\ dummy + \beta_2 \, VC\ Diversity + \beta_3 \, VC\ Diversity \times US\ dummy$$

$$+ \beta_4 \, VC\ Syndicate\ Age + Controls + \varepsilon_1 \quad (1)$$

$$IPO\ Performance = \alpha + \beta_1 \, US\ dummy + \beta_2 \, DCA_{-1} + \beta_3 \, VC\ Diversity + \beta_4 \, DCA_{-1} \, x \, VC\ Diversity$$

$$+ \beta_5 \, DCA_{-1} \, x \, VC\ Diversity \, x \, US\ dummy + \beta_6 \, VC\ Syndicate\ Age + Controls + \varepsilon_2 \quad (2)$$

where *IPO Performance* is measured by underpricing and the buy-and-hold abnormal return (BHAR). Underpricing is the first day stock price return, and further empirical tests use the logarithm of (1+ Underpricing) to control for the skewness of underpricing. The Buy-and-Hold Abnormal Return (BHAR) is adjusted using the value weighted CRSP index in the US and FTSE all shares index in the UK. It is calculated over one- and two-year periods following the closing price of the first day of trading.

In order to calculate DCA_{-1}, we need to generate a benchmark for accruals values in the absence of manipulation (Ball and Shivakumar, 2008). After generating this benchmark, we exclude the non-discretionary current accruals usually driven by firm and industry conditions. The residual represents discretionary accrual that cannot be observed directly from financial statements. Accordingly, we first calculated the current accruals (CA) as the difference between the change in noncash current assets and the change in operating current liabilities (Morsfield and Tan, 2006):

$$CA = \Delta\,[accounts\ receivables + inventory + other\ current\ assets] -$$

$$\Delta\,[accounts\ payable + tax\ payable + other\ current\ liabilities]. \quad (3)$$

Second, we used the cross-sectional adaptation of the modified Jones (1991) model, where current accruals (CA) are regressed on the change in sales in a cross-sectional regression using all firms with the same two-digit SIC code as the issuer in the same calendar period, but excluding the issuer and other IPO firms. Consistent with prior research in DuCharme et al. (2001), we also required that each IPO firm have at least 10 industry-matched firms. To reduce

heteroskedasticity in the data, all variables in the regression were scaled by beginning assets for the quarter. The specific form of the model is as follows:

$$CA_{j,t} / TA_{j,t-1} = \alpha_0 (1/TA_{j,t-1}) + \alpha_1 (\Delta Sales_{j,t} / TA_{j,t-1}) + \varepsilon_{j,t}, \quad (4)$$

where j∈estimated samples, Δ Sales is the change in sales, and TA is total assets.

We then used the estimates of coefficients in equation (4) to compute the nondiscretionary current accruals as follows:

$$NDCA_{i,t} = \hat{\alpha}_0 (1/TA_{i,t-1}) + \hat{\alpha}_1 [(\Delta Sales_{i,t} - \Delta TR_{i,t-1}) / TA_{i,t-1}], \quad (5)$$

where $\hat{\alpha}_0$ is the estimated intercept and $\hat{\alpha}_1$ is the slope coefficient for IPO firm i in quarter t, and $\Delta TR_{i,t}$ is the change in trade receivables in quarter t for issuer i. The increase in trade receivables is subtracted from the change in sales to control for possible manipulation of credit sales by the IPO firm. The discretionary current accruals (DCA) are measured as the difference between CA and nondiscretionary current accruals. This is defined as follows:

$$DCA_{i,t} = CA_{i,t} / TA_{i,t-1} - NDCA_{i,t} = CA_{i,t} / TA_{i,t-1} - NDCA_{i,t}, \quad (6)$$

where $DCA_{i,t}$, discretionary current accruals, represents the abnormal accruals for an IPO firm i in quarter t.

To measure VC diversity per IPO firm, we collected data on affiliation, age, and origin for each member of the VC syndicate.[2] We therefore collected detailed information on the VC affiliation (e.g., an independent VC, bank-affiliated VC, financial/non-bank affiliated VC, corporate VC, University endowment/spin-out unit, VC owned by public authorities and VC owned by a pension fund). We also collected data on VC age range using 6 years as a cut-off

[2] Venture Capital firms were identified from the British Venture Capital Association Directory, Pratt's Guide to Venture Capital Sources, and Venture Capital Report Guide to Venture Capital in the UK, and from the Venture Expert database and Pratt's Guide to Venture Capital Sources in the US. The data also includes Venture Capital Trusts (VCTs) managed by established venture capital firms.

period (e.g., below 6 years, between 6 and 13 years, between 13 and 19 years etc.) and country of origin (e.g., US, UK, Europe, Japan, Australia & Asia, Canada and the rest of the World). We then counted the number of sub-groupings in terms of affiliation, age and origin for each member of the VC syndicates. For example, if a syndicate includes independent, bank-affiliated and corporate VCs, the affiliation number would be 3. The same procedure was applied to age and origin sub-groupings. The overall *VC diversity* is measured as the sum of numbers for the three types of sub-groupings within a particular VC syndicate, with a lower bound of zero for non-VC-backed IPOs.[3] We also controlled for VC reputation by adding VC Age collected from the SDC Platinum Venture Expert database. The age of the VC firm is equal to the difference between the IPO date and the founding date of the VC firm, and we use the cumulative age of the VC firms for a specific IPO. To address the possibility of the effects of institutional differences between the UK and US IPOs in the sample, we use a dummy variable equal to 1 for the US and zero otherwise. To test our country-specific hypotheses we use interactions between the US dummy and explanatory variables.

Our regression models control for a number of factors used in the earnings management and IPO literature. In terms of IPO firm characteristics, this includes IPO firm age which is equal to the number of years between the inception date of the IPO firm and the IPO date. We also control for IPO firm size, measured as the firm's market capitalization in US dollars. Old and large companies which usually have established internal control and accounting systems are expected to have lower earnings management (DCA_{-1}) and underpricing and higher long-run BHAR (Lee and Masulis, 2011). We also add a hi-tech dummy that is equal to 1 if the firm was

[3] In further robustness tests, we replaced VC diversity by adjusted VC diversity, i.e., VC diversity divided by the total number of VCs within a particular syndicate. The results remained consistent with the present findings of the paper.

from the information technology and software sector, zero otherwise.[4] Hi-tech firms face greater information asymmetry and have more growth options, they are more likely to manage earnings and they are harder to value (Bruton et al., 2010). Since firms with a greater book-to-market value are likely to be more established, have larger tangible assets, and fewer incentives to manipulate accounting earnings, we add a *Pre-IPO Book to Market ratio*, which is expected to be negatively related to earnings management and underpricing, but positively related to long-run aftermarket performance. Since debt holders usually provide their borrowers with greater monitoring, we use *Pre-IPO leverage*, measured by total debt to total assets ratio, which is expected to be negatively related to DCA_{-1} and underpricing, but positively related to long-run BHAR. Since firms with operational losses are likely to manage earnings (Kothari et al., 2005), we use a *Loss dummy* which is equal to 1 if the operating performance (earnings before interest and taxes) in the last quarter prior to IPO date is negative, zero otherwise. We expect DCA_{-1} and underpricing to increase and the long-run BHAR to decrease in firms with pre-IPO losses. Moreover, there is evidence that firms with higher current assets are more likely to experience fraud (Persons, 1993). As such, we control for the *Current assets to total asset ratio* and expect firms with higher current assets to have more opportunities to use accruals to manage earnings.

We also control for possible monitoring effects of top auditors and prestigious underwriters. We therefore expect a negative association between DCA_{-1} and the reputation of IPO auditor and underwriter (Brau and Johnson, 2009; Chang et al., 2010). We use a *Top auditor* dummy that is equal to 1 if the IPO firm hires the audit services of a big 6 reputable auditor, zero otherwise. We also calculate the cumulative market share over a five-year period prior to the

[4] In line with Loughran and Ritter (2004), hi-tech firms as those with the following SIC codes: 3571, 3572, 3575, 3577, 3578 (computer hardware), 3661, 3663, 3669 (communications equipment), 3671, 3672, 3674, 3675, 3677, 3678, 3679 (electronics), 3812 (navigation equipment), 3823, 3825, 3826, 3827, 3829 (measuring and controlling devices), 3841, 3845 (medical instruments), 4812, 4813 (telephone equipment), 4899 (communications services), 7371, 7372, 7373, 7374, 7375, 7378, and 7379 (software).

IPO date as a proxy for underwriter reputation (Chahine et al., 2007). Empirical tests use a dummy variable, *Underwriter Reputation*, which is equal to one if the underwriter is part of the top 10 underwriters in the U.K. or the U.S. IPO markets, based on their cumulative market share, zero otherwise. Empirical investigations also include *VC Lead Ownership Power* to control for the potential governance roles played by a powerful lead VC within the VC syndicate. *VC Lead Ownership Power* is the pre-IPO ownership of lead VC firm as a fraction of the pre-IPO ownership of all VC syndicate members.

Finally, we control for the bubble period of rapid growth which can affect valuations using *Bubble dummy*, which is equal to 1 if the IPO occurred during the period 1999-2000, zero otherwise[5]. We also use a *Market Return* variable which is equal to the buy-and-hold return of the market index of the respective country index (Value Weighted CRSP Index in the US, FTSE all shares in the UK) during the one-month period prior to the IPO date to control for high market inflows immediately prior to the IPO.

To test our hypotheses we use OLS regression analysis with White heteroskedasticity consistent standard errors and covariance. However, since we expect that DCA_{-1} depends on the level of VC diversity, empirical analysis of the association between IPO performance and both DCA_{-1} and VC diversity using OLS estimations may be biased. To address this concern, we control for the potential endogeneity of DCA_{-1} using a two-stage least squares (2SLS) regression. To deal with potential endogeneity, this procedure requires an instrument that is not included in IPO performance regressions, and which is correlated with the endogenous variable (DCA_{-1}), but is not correlated with the error term. We use the *Current assets to total assets ratio* during the

[5] Cohen et al. (2008) also document a significant decline in accrual-based earnings management after the passage of the Sarbanes-Oxley Act of 2002. They argue that firms switched from accrual-based to real earnings management methods following SOX. Therefore, we introduced a SOX dummy to account for this important change in the US regulation. However, its effects were insignificant.

last quarter prior to IPO date, as an instrument. This variable satisfies the necessary conditions for a valid instrument for a number of reasons. On the one hand, pre-IPO discretionary current accruals are expected to be positively related to the current assets to total assets ratio. On the other hand, the current assets to total assets ratio is not directly related to IPO performance, and we find low correlation coefficients between the current asset to total assets ratio and both underpricing and the buy-and-hold abnormal return over a one year period (0.04 and -0.05, respectively).

4. Empirical Results

4.1. Descriptive Statistics

Table 1 indicates an average underpricing of 25.2%, which is negatively skewed when compared to its median value of 7.9%, and which is significantly higher in US IPOs (*p=1%*). In terms of firm characteristics, an average firm goes public 11.8 years after its inception, and has an average market capitalization of $364.8 million. The liabilities (current assets) of an average IPO firm represent 52% (29.7%) of its total assets during the last quarter preceding the IPO date, and its book value of equity reaches 42% of the market value of equity. Around 41% of studied IPOs are hi-tech firms, and a small fraction of firms going public experience operating losses prior to their IPOs (24.5%), but this is significantly higher in the US (*p=1%*). The average lockup period is equal to 274 days, and this is significantly longer in UK IPOs (359 days) compared to 188 days in US IPOs (*p=1%*). Top auditors are involved in a significant fraction of our sample (83.9% of IPO firms), and almost half of our IPO sample is underwritten by reputable investment bankers. An average IPO firm usually goes public following a positive market return of 1% during 20 days prior to the IPO date.

Table 1 Near Here

In terms of VC involvement, the average ownership of Lead VC firms represent 62% of shares held by VC syndicate members at the IPO date, and this is significantly higher in UK IPOs (*p=1%*). An average IPO firm's syndicate involves 2.54 VC firms, with a cumulative VC age of 35.6 years. The average VC syndicate diversity is equal to 4.72, and this is mainly the result of age diversity (1.938), followed by affiliation diversity (1.522) and origin diversity (1.259). US VC-backed IPOs exhibit higher age and affiliation diversities than UK VC-backed IPOs (at the 5% and 10% levels, respectively). In line with prior research, Panel A in Table 2 indicates that the average discretionary current accruals during the quarter that precedes IPO (DCA_{-1}) are equal to 3.1% of the total assets, and this is significantly different from zero at the 1% level. Moreover, US IPOs exhibit a significantly higher DCA_{-1} than UK IPOs (*p=5%*), which may reflect the existence of higher principal-agent conflicts. Table 2 also shows an overall decreasing average DCA following the IPO date (from 2.7% during the IPO quarter to -0.1% at the end of the 3rd quarter following the IPO date). In line with Chang et al., (2010), the reversed trend following the IPO suggests that the increase in DCA is not completely attributable to changes in business operations and working capital, as suggested by Ball and Shivakumar (2008).

Table 2 Near Here

Panel B in Table 2 examines the long-run aftermarket performance of IPOs. It presents the buy-and-hold abnormal return of US and UK IPOs adjusted by their respective market indices. Table 2 indicates a negative BHAR of -1.9% during the 180 days following the IPO date for the entire sample. BHAR is equal to -9.3% over a one-year period and -3.2% over a two-year period following the IPO date. This however hides two contrasting trends where US IPOs significantly underperform their market index (-13.4% on average), whereas UK IPOs

significantly outperform their market index (9.7%) during the 180 days following IPOs. The difference in both trends continues during the one- and two-year periods following the IPO date.

4.2. Earnings Management and VC Diversity

Table 3 includes the regressions for pre-IPO discretionary current accruals as a dependent variable. Models (1a) to (4a) presents the linear effects of the various proxies of VC diversity (affiliation, age, origin and the total of three), whereas Models (1b) to (4b) control for the moderating effects of the US dummy on the association between DCA_{-1} and the various proxies for VC diversity.

Table 3 Near Here

Models (1a) to (4a) show a positive association between DCA_{-1} and US dummy (*p=1%*), thus suggesting higher pre-IPO discretionary current accruals in US IPOs. In line with our predictons, DCA_{-1} is positively related to the four proxies of VC diversity at the 5% level or higher. Model (4a), for example, shows that DCA_{-1} increases by 0.14% for every 10% increase in VC diversity. This is consistent with our prediction of a positive effect of principal-principal conflicts of interests on DCA_{-1}.

There is also evidence of a positive and significant moderating effect of the US dummy on the association between DCA_{-1} and VC diversity at the 10% level or higher. Model (4b) indicates that for every 10% increase in VC diversity, DCA_{-1} is 0.12% higher in UK IPOs, and the incremental effect of VC diversity is 0.06% higher in US IPOs. This indicates that, compared to UK IPOs, DCA_{-1} is more positively related to VC diversity in US IPOs, which is consistent with our predictions.

In terms of control variables, Models (3a,b) and (4a,b) indicate a negative and significant association between VC age and DCA_{-1} (at the 10% level or higher). This suggests that IPOs

backed by older VC firms, used as a proxy for reputation, are less likely to face agency problems related to earnings management. All models in Table 3 show a negative association between DCA_{-1} and firm size, top auditor dummy, and lockup period (at the 10% level or higher). Larger firms, firms with more reputable auditors and with longer commitment of their initial shareholders are less likely to engage in earnings management. On the contrary, DCA_{-1} is higher in IPO firms with pre-IPO operating losses and firms with higher current assets to total assets ratio (at the 10% level or higher).

4.3. Underpricing, Earnings Management and VC Diversity

Table 4 examines the association between underpricing and both pre-IPO discretionary current accruals and VC diversity. Models (5a,b) control for both the linear and interaction effects of DCA_{-1} and VC diversity on underpricing, and Models (6a,b) control for the moderating country effect on the association between underpricing and the interaction between DCA_{-1} and VC diversity. Models (5a) and (6a) use OLS regressions, whereas Models (5b) and (6b) present 2SLS regressions controlling for the endogenous determination of DCA_{-1}. Specifically, the 2SLS regressions in Models (5b) and (6b) use the results in Model (4a) as a first stage and the current assets to total assets ratio as an instrumental variable. In line with our expectations, a Hausman (1978) specification test indicates potential endogeneity of DCA_{-1} (at the 1% significance level). Based on Staiger and Stock (1997), both the high R-square and F-statistic (which is higher than 10 in Model (4a)) confirm the strength and the reliability of the current assets to total assets ratio as an instrument for pre-IPO discretionary current accruals.

Table 4 Near Here

Both OLS and 2SLS models in Table 4 show a positive and significant association between underpricing and the US dummy variable (at the 5% level or higher), which suggests

that the first day return is significantly higher in US IPOs compared to UK IPOs. Underpricing is positively related to pre-IPO discretionary current accruals (at the 5% level or higher). It is also positively related to VC diversity (*p=1%*). There is also a positive association between underpricing and the interaction term between DCA_{-1} and VC diversity (at the 5% level or higher). In line with our expectations, this suggests that investors are likely to require a higher risk premium in firms where both principal-agent and principal-principal conflicts of interests are likely to be higher. The results in Models (6a,b) confirm our expectations and show that, compared to UK IPOs, the effect of the interaction between DCA_{-1} and VC diversity on underpricing is significantly higher in US IPOs. This is consistent with our prediction that network-based relationships among VC firms in the UK are likely to reduce the extent to which investors expect agency problems at IPO.

In terms of control variables, all models in Table 4 show results that are consistent with prior research. Specifically, underpricing is negatively related to the cumulative age of VC syndicate, firm size, auditor reputation, and lockup period (at the 5% level or higher). Moreover, underpricing is higher in hi-tech firms, those with a pre-IPO operating loss (*p=10%*), those underwritten by more reputable investment bankers, firms that went public during the bubble period 1999-2000 (*p=1%*), and following a positive market index return.

4.4. Long-run Aftermarket Performance, Earnings Management and VC Diversity

Table 5 includes regression analysis for buy-and-hold returns over one-year and two-year periods following the IPO date (BHAR 1Y and BHAR 2Y, respectively). Models (7a,b) examine both the linear and interaction effects of DCA_{-1} and VC diversity on BHAR 1Y, and Models (8a,b) control for the moderating US dummy effect on the association between BHAR 1Y and the interaction between DCA_{-1} and VC diversity. Models (7a) and (8a) use OLS regressions,

whereas Models (7b) and (8b) present 2SLS regressions controlling for the endogenous determination of DCA_{-1}. Model (9) includes the 2SLS results for BHAR 2Y. In line with the regression analysis in Table 4, the 2SLS regressions in Models (7b), (8b), and (9) use the results in Model (4a) as a first stage.

Table 5 Near Here

Models (7) to (9) show that the long-run aftermarket performance is lower in US IPO firms over both the first and second year period (at the 5% level or higher). BHAR 1Y and 2Y are both negatively related to pre-IPO discretionary current accruals (at the 5% level or higher), which suggests that aftermarket performance is negatively related to earnings management. BHAR is also negatively related to VC diversity (at the 5% level or higher), consistent with prior research in Teoh et al. (1998b). In line with our predictions, the long-run performance is negatively related to the interaction term between DCA_{-1} and VC diversity (at the 5% level or higher). A 10% increase in the interaction between DCA_{-1} and VC diversity reduces BHAR-1 by 4.1% to 4.7%. The long run performance is even lower in US IPOs with higher VC diversity and earnings management (at the 10% level or higher), in line with our expectations.

5. Further Robustness Tests

5.1. The Endogenous Choice of VC Diversity

An additional empirical concern relates to potential endogeneity of VC backing itself. Indeed, VC firms may not randomly decide to syndicate portfolio companies, and syndication decisions may be related to firm-level characteristics such as riskiness, geographic location, industry clustering, etc. To deal with potential endogeneity of syndication in further robustness tests, we use a 2SLS regression procedure with appropriate instrument variables[6]. Specifically,

[6] The Hausman (1978) specification test indicates potential endogeneity of VC diversity (at the 5% level or higher). The high R-square and F-statistic (which is higher than 10 in Model (10)) confirm the strength and the reliability of

we follow Lee and Masulis (2011) and argue that IPO firms that are located near VC clusters are more likely to obtain a syndicated investment. We used three dummies for an IPO firm's location in California and Massachusetts in the US, and in Greater London in the UK as instruments for VC syndication. Controlling for the endogeneity of VC diversity, the overall results confirm our conclusions in Tables 4 to 6, and they indicate that DCA_{-1} is positively affected by the extent of VC diversity. Both sources of agency conflicts are likely to increase underpricing and to reduce the long-run aftermarket performance and this is more significant in US IPOs.

5.2. Post-lockup Long-run Aftermarket Performance, Earnings Management and VC Diversity

Prior research provides empirical evidence showing a drop in stock prices at the end of the lockup period when more shares become available to the public (Yung and Zender, 2010). Since UK IPOs tend to have a longer lockup period than US IPOs, UK VCs may provide a stronger signal of credible commitment to the venture (and a longer investment horizon) (Arthurs et al., 2008). Accordingly, UK VCs may be less willing to allow short-term behaviors including earnings management compared to US VCs. This suggests that post-lockup period long-run performance is negatively related to pre-IPO earnings management with higher VC diversity, and this is stronger in US VC syndicated IPOs. Further investigations indicate that the post-lockup market performance (both over 180 days and one year period following the lockup period) is negatively and significantly related to US dummy, pre-IPO discretionary current accruals, VC diversity, as well as the interaction between both variables. Moreover, evidence about a lower market performance in the interaction term of DCA_{-1} and VC diversity in US IPOs suggests that US IPOs are more likely to engage in conflicting behavior prior to exiting their portfolio companies than UK IPOs.

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the geographic location dummies as instruments for VC diversity, which supports the use of a second-stage 2SLS regressions

6. Conclusion

Prior research indicates an increase in pre-IPO discretionary current accruals, used as a proxy for earnings management, around the IPO event. In contrast with prior research on the certification and monitoring roles played by VC firms, we find evidence that a VC syndicate's diversity increases the extent of pre-IPO discretionary current accruals. This is consistent with a moral hazard perspective, where principal-principal conflicts of interest among syndicate members are likely to amplify principal-agent problems between the IPO firm and public market investors. We also show that prior results on the association between earnings management and IPO performance are intensified in firms with higher VC diversity. Specifically, underpricing increases, and long-run aftermarket performance decreases, in IPO firms with higher earnings management and VC diversity. Besides showing consistent results between different measures of performance, we also show that our results are robust to alternative measures for earnings management while taking into account endogeneity issues. Using a matched sample of US and UK IPOs, our analysis indicates that our hypothesized relationships between VC diversity, earnings management and performance are moderated by the US country dummy. This suggests that the extent of agency conflicts among VC syndicate members investing in IPO firms may differ based on the institutional setting in which they occur. Examining how institutional settings create different incentives and disincentives among competing firms (Wan and Hoskisson, 2003) should be an area of continued future research. Likewise, how institutions evolve over time and thereby affect and change the nature of conflicts among owners and managers and between firms would be of importance as well.

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Table 1

Table 2 presents descriptive statistics in mean, median, and standard deviation for the entire sample as well as both US and UK IPOs.

	Total Sample (N=274)		US IPOs (N=137)		UK IPOs (N=137)		
	Mean Std-dev	Median	Mean Std-dev	Median	Mean Std-dev	Median	T-test Difference
Underpricing	0.252 0.505	0.079	0.401 0.594	0.181	0.103 0.338	0.033	0.000***
IPO Firm Characteristics							
IPO Firm Age	11.847 17.180	7.000	9.584 8.452	6.000	14.109 22.599	7.000	0.029**
Market Capitalization (in $mil)	364.839 622.967	183.069	389.576 651.341	185.957	340.102 594.601	182.422	0.512
Hi-tech dummy	0.409 0.493	0.000	0.394 0.490	0.000	0.423 0.496	0.000	0.625
Pre-IPO Book-to-Market ratio	0.420 0.668	0.257	0.334 0.629	0.237	0.507 0.697	0.299	0.032**
Pre-IPO Leverage	0.524 0.377	0.466	0.652 0.408	0.618	0.396 0.294	0.357	0.000***
Loss dummy	0.245 0.431	0.000	0.358 0.481	0.000	0.131 0.339	0.000	0.000***
Current Assets-to-Total Assets	0.297 0.218	0.238	0.275 0.214	0.216	0.318 0.221	0.268	0.099*
Lockup Period (in days)	273.617 112.264	365.000	188.438 91.229	180.000	358.796 48.566	365.000	0.000***
Top Auditor dummy	0.839 0.368	1.000	0.869 0.339	1.000	0.810 0.394	1.000	0.189
Underwriter Reputation	0.478 0.500	0.000	0.453 0.500	0.000	0.504 0.502	1.000	0.399
Market Conditions							
Bubble dummy	0.434 0.497	0.000	0.467 0.501	0.000	0.401 0.492	0.000	0.274
Market Return	0.010 0.052	0.009	0.020 0.061	0.018	0.000 0.039	0.004	0.002***
VC Firms Involvement							
Lead VC Ownership Power	0.619 0.351	0.581	0.545 0.368	0.476	0.694 0.317	0.800	0.000***
VC Syndicate	2.544 1.846	2.000	2.737 1.820	2.000	2.350 1.857	2.000	0.083*
VC Syndicate Age	35.577 43.469	21.000	34.628 39.792	21.000	36.526 46.987	21.000	0.719
VC Diversity	4.719 2.084	4.000	4.934 2.084	4.000	4.504 2.069	3.000	0.087*
VC Affiliation Diversity	1.522 0.766	1.000	1.599 0.790	1.000	1.445 0.737	1.000	0.098*
VC Age Diversity	1.938 1.119	2.000	2.073 1.116	2.000	1.803 1.110	1.000	0.046**
VC Origin Diversity	1.259 0.501	1.000	1.263 0.504	1.000	1.255 0.500	1.000	0.904

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

Table 2

Panel A: Quarterly Discretionary Current Accruals (DCA) around IPO date. DCA_{-1} represents the Quarterly Discretionary Current Accruals in quarter immediately prior to IPO date. DCA_0 is the Discretionary Current Accruals for the quarter during which the IPO occurred. DCA_1, DCA_2, DCA_3 include results for the first, second, and third quarter following the IPO quarter.

Per Quarter	DCA_{-1}	DCA_0	DCA_1	DCA_2	DCA_3
Total Sample (N=274)					
Mean	0.031[a]	0.027[a]	0.008[a]	0.008[a]	-0.001
Median	0.009	0.013	0.000	0.000	0.000
Std-dev	0.082	0.066	0.045	0.042	0.053
US IPOs (N=137)					
Mean	0.043[a]	0.045[a]	0.012[b]	0.011[b]	-0.002
Median	0.033	0.052	0.010	0.011	0.000
Std-dev	0.098	0.076	0.055	0.052	0.068
UK IPOs (N=137)					
Mean	0.019[a]	0.009[b]	0.005[b]	0.005[c]	-0.001
Median	0.000	0.000	-0.001	0.000	0.000
Std-dev	0.059	0.050	0.034	0.029	0.031
T-test for difference US versus UK IPOs	0.018**	0.000***	0.268	0.212	0.970

Panel B: Buy-and-hold abnormal returns over 180 days, one year and two years following the IPO date. Aftermarket performance is adjusted by the return of market indices in the US and UK markets. This includes the value weighted CRSP index in the US and FTSE all shares index in the UK.

	Total Sample (N=274)		US IPOs (N=137)		UK IPOs (N=137)		
	Mean Std-dev	Median	Mean Std-dev	Median	Mean Std-dev	Median	T-test Difference
BHAR 180	-0.019 0.510	-0.060	-0.134 0.443	-0.150	0.097 0.546	0.061	0.000***
BHAR 365	-0.093 0.781	-0.214	-0.243 0.737	-0.377	0.057 0.796	-0.027	0.001***
BHAR 720	-0.032 0.902	-0.318	-0.222 0.801	-0.386	0.121 0.951	-0.223	0.005***

*, **, ***: Significantly different at the 10%, 5%, and 1% level, respectively.
[c, b, a]: Significantly different from zero at the 10%, 5%, and 1% level, respectively.

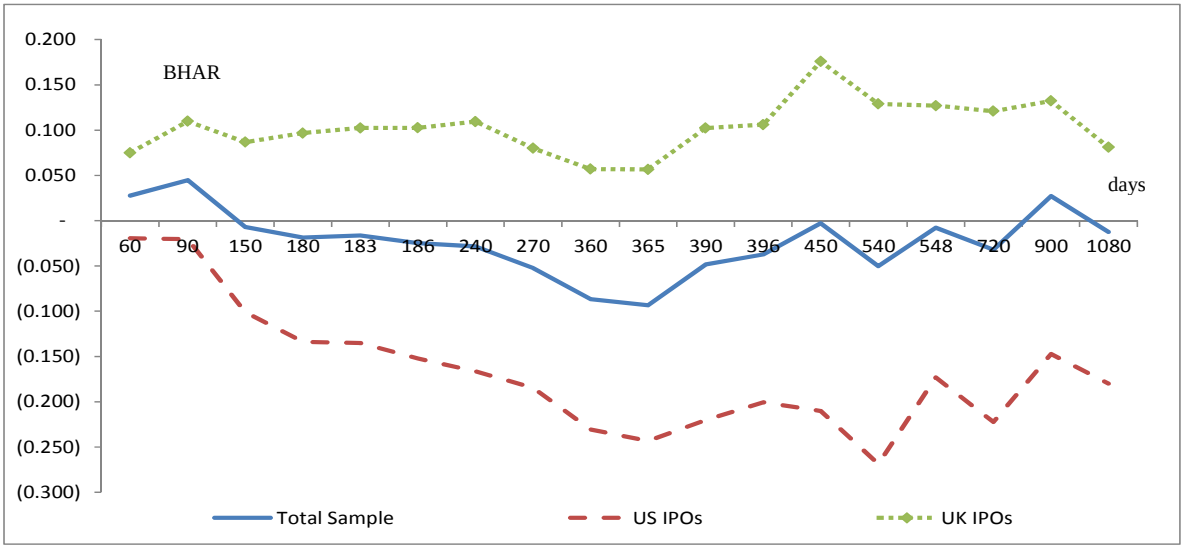

Table 3

Table 3 presents the least squares regressions results for Discretionary Current Accruals in the last quarter prior to the IPO date. Models (1a) to (4a) examine the linear association between pre-IPO discretionary current accruals (DCA_{-1}) and the various types of VC diversity: VC Affiliation Diversity, VC Age Diversity, VC Origin Diversity, and the calculated VC Diversity including all types of diversities. Models (1b) to (4b) examine the differential effect of the country dummy in the relationship between pre-IPO discretionary current accruals (DCA_{-1}) and the various types of VC diversity: VC Affiliation Diversity, VC Age Diversity, VC Origin Diversity, and the calculated VC Diversity including all types of diversities. *, **, *** represent statistical significance at the 10%, 5%, and 1% level respectively, for a two-tailed t tests. All tests use White heteroskedasticity robust standard errors.

	(1a) OLS	(2a) OLS	(3a) OLS	(4a) OLS	(1b) OLS	(2b) OLS	(3b) OLS
Constant	-0.005	0.014	-0.006	-0.024	0.007		
	0.016	-0.002	-0.015				
	0.029	0.030	0.027	0.032	0.029		
	0.030	0.028	0.031				
US dummy	0.026***	0.028***	0.029***	0.026***	0.016**		
	0.023***	0.021*	0.018***				
	0.009	*0.010*	*0.009*	*0.009*	*0.007*		
	0.008	*0.012*	*0.007*				
VC Affiliation Diversity	0.030***				0.022***		
	0.007				*0.008*		
VC Affiliation Diversity x US dummy					0.015**		
					0.007		
VC Age Diversity		0.014**					
	0.013**						
		0.006					
	0.007						
VC Age Diversity x US dummy							
	0.004*						
	0.003						
VC Origin Diversity			0.042***				0.038***
			0.009				*0.010*
VC Origin Diversity x US dummy							0.012*
							0.007
VC Diversity				0.014***			
				0.003			
VC Diversity x US dummy							
Lead VC Ownership Power	-0.010	-0.014	-0.021	0.000	-0.010	-	
0.014	-0.021	0.000					
	0.017	*0.020*	*0.016*	*0.019*	*0.017*		
	0.020	*0.016*	*0.019*				
VC Syndicate Age	-0.000	-0.000	-0.000**	-0.000*	-0.000	-	
0.000	-0.000**	-0.000*					
	0.000	*0.000*	*0.000*	*0.000*	*0.000*		
	0.000	*0.000*	*0.000*				
IPO Firm Age	0.000	0.000	0.000	0.000	0.000		
	0.000	0.000	0.000				
	0.000	*0.000*	*0.000*	*0.000*	*0.000*		
	0.000	*0.000*	*0.000*				
Log(Market Capitalization)	-0.008**	-0.007**	-0.008**	-0.008**	-0.007**	-	
0.007**	-0.008**	-0.008**					
	0.003	*0.003*	*0.003*	*0.003*	*0.003*		
	0.003	*0.003*	*0.003*				
Hi-tech dummy	0.002	0.002	0.004	0.003	0.002		
	0.002	0.004	0.003				
	0.008	*0.009*	*0.008*	*0.008*	*0.008*		
	0.009	*0.008*	*0.008*				
Pre-IPO Book-to-Market	-0.005	-0.007	-0.011	-0.006	-0.005	-	
0.006	-0.011	-0.006					

	0.006	*0.006*	*0.006*	*0.006*	*0.006*		
	0.006	*0.006*	*0.006*				
Pre-IPO Leverage	0.006	0.003	0.002	0.006	0.006		
	0.003	0.002	0.006				
	0.013	*0.013*	*0.013*	*0.013*	*0.013*		
	0.013	*0.013*	*0.013*				
Loss dummy	0.010	0.011	0.013*	0.013*	0.010		
	0.011	0.013*	0.013*				
	0.011	*0.012*	*0.007*	*0.007*	*0.012*		
	0.012	*0.007*	*0.008*				
Current Assets-to-Total Assets	0.138***	0.148***	0.142***	0.134***	0.132***		
	0.147***	0.140***	0.129***				
	0.020	*0.020*	*0.020*	*0.020*	*0.020*		
	0.021	*0.021*	*0.021*				
Lock-up Period	-0.000*	-0.000*	-0.000*	-0.000*	-0.000*	-	
0.000*	-0.000*	-0.000*					
	0.000	*0.000*	*0.000*	*0.000*	*0.000*		
	0.000	*0.000*	*0.000*				
Top Auditor dummy	-0.019*	-0.021*	-0.013*	-0.016*	-0.018*	-	
0.021*	-0.013*	-0.016*					
	0.011	*0.012*	*0.008*	*0.009*	*0.010*		
	0.012	*0.008*	*0.009*				
Underwriter Reputation	-0.001	-0.004	-0.000	-0.000	-0.001	-	
0.004	-0.000	-0.001					
	0.009	*0.009*	*0.009*	*0.009*	*0.009*		
	0.009	*0.009*	*0.009*				
Bubble dummy	-0.008	-0.006	-0.010	-0.009	-0.009	-	
0.007	-0.010	-0.010					
	0.008	*0.008*	*0.008*	*0.008*	*0.008*		
	0.008	*0.008*	*0.008*				
Adjusted R-squared	0.334	0.304	0.335	0.339	0.335		
	0.301	0.332	0.338				
F-statistic	11.836	11.194	11.156	11.342	11.161		
	10.835	10.649	10.731				
Prob(F-statistic)	0.000	0.000	0.000	0.000	0.000		
	0.000	0.000	0.000				
Number of Observations	274	274	274	274	274	274	274

Table 4

Table 4 presents the OLS and 2SLS regressions results for underpricing on Pre-IPO discretionary current accruals (DCA_{-1}) and VC diversity. Models (5a) and (5b) control for the interaction effect between both DCA_{-1} and VC diversity, whereas Models (6a) and (6b) control for the country dummy in affecting the relationship between underpricing and the interaction term between DCA_{-1} and VC diversity. *, **, *** represent statistical significance at the 10%, 5%, and 1% level respectively, for a two-tailed t tests. All tests use White heteroskedasticity robust standard errors.

	Log(1+Underpricing)		Log(1+Underpricing)	
	(5a)	(6a)	(5b)	(6b)
	OLS	OLS	2SLS	2SLS
Constant	-0.213*	-0.185	-0.287**	-0.209
	0.123	*0.128*	*0.132*	*0.137*
US dummy	0.147***	0.111***	0.200***	0.104**
	0.034	*0.033*	*0.036*	*0.045*
DCA_{-1}	0.654***	0.461**	0.619***	0.478**
	0.233	*0.222*	*0.228*	*0.214*
VC Diversity	0.052***	0.053***	0.064***	0.062***
	0.015	*0.015*	*0.019*	*0.020*
DCA_{-1} x VC Diversity	0.118**	0.105**	0.115**	0.100**
	0.048	*0.049*	*0.048*	*0.045*
DCA_{-1} x VC Diversity x US dummy		0.164**		0.158***
		0.083		*0.058*
Lead VC Ownership Power	0.019	0.017	0.025	0.018
	0.053	*0.053*	*0.053*	*0.053*
VC Syndicate Age	-0.001**	-0.001*	-0.001*	-0.001**
	0.000	*0.000*	*0.000*	*0.000*
IPO Firm Age	-0.000	-0.000	-0.001	-0.000
	0.001	*0.001*	*0.001*	*0.001*
Log(Market Capitalization)	-0.021**	-0.022**	-0.022**	-0.020**
	0.010	*0.010*	*0.010*	*0.010*
Hi-tech dummy	0.061*	0.060*	0.065**	0.064**
	0.031	*0.031*	*0.032*	*0.031*
Pre-IPO Book-to-Market	0.011	0.009	0.004	0.004
	0.022	*0.021*	*0.022*	*0.021*
Pre-IPO Leverage	-0.017	-0.014	-0.010	-0.006
	0.056	*0.057*	*0.058*	*0.059*
Loss dummy	0.040	0.039	0.061*	0.057*
	0.035	*0.035*	*0.036*	*0.034*
Lock-up Period	-0.001***	-0.001***	-0.001***	-0.001***
	0.000	*0.000*	*0.000*	*0.000*
Top Auditor dummy	-0.096**	-0.102**	-0.103**	-0.108**
	0.043	*0.044*	*0.042*	*0.044*
Underwriter Reputation	0.047*	0.051*	0.047*	0.049*
	0.027	*0.029*	*0.027*	*0.029*
Bubble dummy	0.093***	0.081***	0.085***	0.075***
	0.027	*0.026*	*0.027*	*0.027*
Market Return	0.640**	0.704**	0.601**	0.698**
	0.275	*0.278*	*0.281*	*0.279*
Adjusted R-squared	0.539	0.549	0.528	0.546
F-statistic	19.742	19.483	18.936	19.231
Prob(F-statistic)	0.000	0.000	0.000	0.000
Number of Observations	274	274	274	274

The first-stage regression in Model (4a) in Table 4 provides the fitted value used as instrument in the second-stage regressions in Models (5b) and (6b).

Table 5

Table 5 presents the OLS and 2SLS regressions results for the long-run aftermarket performance on Pre-IPO discretionary current accruals (DCA_{-1}) and VC diversity. Models (7a) and (8b) control for the interaction effect between both DCA_{-1} and VC diversity, whereas Models (8a), (8b), and (9) control for the country dummy in affecting the relationship between long-run aftermarket performance and the interaction term between DCA_{-1} and VC diversity. Long-run aftermarket performance is measured using the Buy-and-Hold Abnormal Return over a One year and Two year periods (Models (7&8) and Model (9), respectively). *, **, *** represent statistical significance at the 10%, 5%, and 1% level respectively, for a two-tailed t tests. All tests use White heteroskedasticity robust standard errors.

	BHAR 1Y OLS (7a)	BHAR 1Y OLS (8a)	BHAR 1Y 2SLS (7b)	BHAR 1Y 2SLS (8b)	BHAR 2Y 2SLS (9)
Constant	0.321**	0.338**	0.536***	0.432***	0.935***
	0.151	*0.151*	*0.153*	*0.160*	*0.234*
US dummy	-0.336***	-0.285***	-0.302***	-0.257**	-0.305**
	0.092	*0.100*	*0.084*	*0.103*	*0.144*
DCA_{-1}	-1.105***	-0.797**	-1.067**	-0.727**	-2.741***
	0.388	*0.389*	*0.450*	*0.337*	*0.827*
VC Diversity	-0.048***	-0.037**	-0.051***	-0.048***	-0.107**
	0.016	*0.016*	*0.016*	*0.015*	*0.039*
DCA_{-1} x VC Diversity	-0.473***	-0.447***	-0.455***	-0.411**	-0.229**
	0.178	*0.166*	*0.141*	*0.190*	*0.104*
DCA_{-1} x VC Diversity x US dummy		-0.101***		-0.109***	-0.084*
		0.038		*0.040*	*0.049*
Lead VC Ownership Power	0.153	0.159	0.153	0.158	0.306*
	0.157	*0.157*	*0.157*	*0.154*	*0.169*
VC Syndicate Age	0.001	0.001	0.001*	0.001*	0.001*
	0.001	*0.001*	*0.001*	*0.001*	*0.001*
IPO Firm Age	-0.001	-0.001	-0.001	-0.001	-0.003
	0.001	*0.001*	*0.001*	*0.002*	*0.003*
Log(Market Capitalization)	0.056*	0.055*	0.056*	0.072**	0.063*
	0.032	*0.032*	*0.032*	*0.034*	*0.036*
Hi-tech dummy	-0.026	-0.025	-0.026	-0.030	-0.060
	0.089	*0.089*	*0.089*	*0.090*	*0.104*
Pre-IPO Book-to-Market	-0.030	-0.031	-0.030	-0.010	-0.045
	0.045	*0.044*	*0.045*	*0.047*	*0.086*
Pre-IPO Leverage	-0.069	-0.071	-0.069	-0.048	-0.093
	0.108	*0.109*	*0.108*	*0.107*	*0.176*
Loss dummy	-0.176**	-0.185**	-0.176**	-0.213**	-0.091
	0.087	*0.088*	*0.087*	*0.088*	*0.144*
Top Auditor dummy	-0.276*	-0.279*	-0.276*	-0.257*	0.224
	0.151	*0.151*	*0.151*	*0.155*	*0.190*
Underwriter Reputation	0.133*	0.136*	0.133*	0.133*	0.158*
	0.079	*0.080*	*0.079*	*0.079*	*0.094*
Bubble dummy	-0.266***	-0.273***	-0.266***	-0.246***	-0.335***
	0.089	*0.090*	*0.089*	*0.091*	*0.109*
Adjusted R-squared	0.310	0.309	0.310	0.283	0.276
F-statistic	9.195	8.623	9.195	7.740	6.274
Prob(F-statistic)	0.000	0.000	0.000	0.000	0.000
Number of Observations	274	274	274	274	222

The first-stage regression in Model (4a) in Table 4 provides the fitted value used as instrument in the second-stage regressions in Models (9), (10), and (11).