VC investments and global exits

Abstract

This paper examines exits of UK venture capital backers (VCs) from portfolio companies around the world. Mergers and acquisitions (M&A) are the most frequently used exit route for all investments, both in the UK and abroad. Exit through M&A is particularly common for investments in the UK while the probability of an exit through an initial public offering (IPO) is substantially lower for investments made in the UK than abroad. We are able to explain these country differences in terms of variations in the characteristics of VCs, portfolio companies, legal systems and market conditions. Portfolio companies backed by experienced VCs have high probabilities of exits through M&A or IPO. A successful exit is more likely when a VC syndicate includes an experienced member. The likelihood of a successful exit through M&A, IPO or management buyouts (MBO) is high in countries with, and at times of, high stock market liquidity. Legal systems that provide more investor protection facilitate exits through IPO or M&A.

Key words: VC investments; M&A exit; IPO exit; legal system; market liquidity; syndicates

I.   INTRODUCTION

We study the routes chosen by UK venture capital (VC) firms to exit their investments in portfolio companies around the globe. In this study, the term 'venture capital' refers to investments in early stage, expansion and later stage financing rounds. The UK VC industry has grown in size and volume over the last few decades and is the second largest in the world, after the US, in terms of the total value of investments. A recent report from the British Venture Capital Association (BVCA 2010) indicates that UK venture capital backers (VCs) continue to finance a large number of investments, both within the UK and abroad.

Our study focuses on VC investments in early stage, expansion stage and later stage rounds. VC consists of investments in young companies that require money to start up and develop business ideas and later pursue growth targets. By contrast, private equity (PE) invests in established and mature companies. Many prior studies of the UK focus exclusively on PE investments, typically in the form of investments in management buyouts (MBOs).[1] Generally, buyout investments are much larger than VC investments and differ from them in terms of the characteristics of the portfolio companies (BVCA 2010).

The decision by a VC firm to invest depends on the expectation of a successful exit from the portfolio company (Pearce and Barnes 2006; Cumming 2008). Exit routes and exit prospects are critical not only to the VC firms but also to portfolio (investee) companies, and to the economy at large (Bottazzi and Da Rin 2002). If VCs find it difficult to successfully exit their existing investments, domestically or abroad, investors in existing funds will be reluctant to invest in follow-on funds (Schwienbacher 2008).

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[1] For example, following Kaplan (1991), Wright, Robbie, Thompson and Starkey (1994) examine buyout longevity in the UK. Wright, Thompson, Robbie and Wong (1995) further examine the nature and influences on the longevity of UK buyouts and buy-ins. Lockett and Wright (2001) examine the syndication of PE-backed MBOs in the UK. Jelic, Saadouni and Wright (2005) focus on the performance of public-to-private MBOs. Arberk, Filotchev and Wright (2006) and Filatotchev (2006) investigate the post-IPO performance and governance of VC and PE-backed and unbacked UK companies. Coakley, Hadass and Wood (2007) examine the operating performance of VC and PE-backed UK IPOs. Nikoskelainen and Wright (2007) examine the exits of UK buyouts. Jelic (2011) examines the survival of PE-backed and unbacked UK buyouts. Jelic and Wright (2011) focus on buyout investments in the UK and examine the exits and performance of UK PE backers.

The focus of our analysis is the type of exit route used, in terms of the (determinants of the) probabilities that VCs exit through particular routes (as opposed to exiting through liquidation). We consider exits through IPOs, M&As (trade sale) or MBOs to be successful (unlike liquidation) in the sense that VC backers are likely to achieve good returns. Using a sample of investments by UK VCs, exited during 1990-2010, we examine the routes to exit and the determinants of the choice of exit route. Our study complements previous research on the choice of exit routes in the US (e.g. Lerner 1994; Cumming and MacIntosh 2003; Poulsen and Stegemoller 2008; Bayar and Chemmanur 2012) and the Asia-Pacific region (Cumming, Fleming and Schwienbacher 2006). Our paper is also related to studies that examine the time to exit (Cumming and MacIntosh 2001; Schwienbacher 2002; Giot and Schwienbacher 2007; Cumming and Johan 2010).

Our results show that, while a trade sale (M&A) is the most commonly used exit route for all investments by UK VCs (both in the UK and abroad), it is more frequently used to exit UK investments than those abroad. Surprisingly, the probability of an IPO exit is substantially higher for investments in portfolio companies outside the UK than those in the UK.

The results of our empirical analysis explain these country differences in terms of variations in the characteristics of VC backers, portfolio companies, legal frameworks and market conditions. We find that experienced VC firms have a higher probability of successful exits than inexperienced ones. Contrary to the results of Gompers (1996), we find no evidence of young UK VCs rushing to exit portfolio companies. The composition of VC syndicates is important in enhancing the probability of a successful exit through M&A or IPO, especially when syndicate members include reputable VC firms.

Stock market characteristics and the legal system of the country of the portfolio company are important determinants of the VC firms' choice of exit routes. The higher is the market liquidity, the higher is the probability of a successful exit. The effect of market liquidity

is both temporal and cross-sectional. IPO and M&A exits are more likely when the country of the portfolio company is characterised by a legal system with high investor protection.

The remainder of this paper is organised as follows: Section II discusses the role and determinants of VC exits. In Section III we discuss our hypotheses. Section IV describes our data and methodology. Our empirical findings are discussed in Section V, while our conclusions are presented in Section VI.

II.   THE ROLE OF EXIT IN THE VC INDUSTRY

The success of the VC industry depends on VC firms' ability to raise capital and exit their portfolio companies successfully. VCs are involved in start-up financing and are expected to engage with their backed companies for only a limited period of time. The exit process is a key part of the VC cycle and enables a quantitative assessment of VC performance (Schwienbacher 2008). VCs raise funds from pension funds, banks, insurance companies, and high-net-worth individuals (limited partners, LPs); they manage the fund on behalf of the LPs for a typical period of 10 years and invest in a number of portfolio companies (Pearce and Barnes 2006; Kandel, Leshinskii, and Yuklea 2011; Metric and Yasuda 2010). VCs enter into contracts with entrepreneurial companies, defining possible exit routes for their investments (Clercq, Fried, Lehtonen and Sapienza 2006). In some cases, the contracts include a clause requiring entrepreneurs to buy back their shares if an IPO or M&A has not occurred within a specified timeframe (Pearce and Barnes 2006). This buyback method is typically less profitable for VCs, as there is no new capital coming into the company. Upon exit from an investment, VCs pay back the LPs prior to securing investors for a new fund.

The probability and mode of VC exit from backed companies is of general interest not only to VCs and portfolio companies but also to policy makers. As portfolio (or investee) companies usually do not pay dividends, LPs realise returns from their investments only when VCs exit their investments. A successful exit allows VCs to raise additional funds from LPs,

which in turn allows the VCs to make new investments, thereby contributing to the growth of the portfolio company, its industry, and the overall economy. Owners of portfolio companies (entrepreneurs) are also interested in the probabilities of alternative VC exit routes. Cumming (2008) argues that entrepreneurs are likely to favour exit through an IPO because this allows them to retain (or regain) a degree of control over their companies, unlike a trade sale (i.e., an acquisition) or a liquidation (or write-off). Policy makers understand the role the VC industry plays in the overall development of the economy. If the VC cannot successfully exit due to inefficiencies in the capital markets, the VC industry is likely to exhibit slower growth or even stagnation, which would adversely affect the entrepreneurial activity in an economy.

III. DEVELOPMENT OF HYPOTHESES

We consider all forms of exit: IPOs, M&As, liquidations and MBOs. Controlling for industry and year effects, we study three categories of determinants of exit probability: first, variables related to the VC or the VC investment; second, variables related to the portfolio (investee) company; and third, the impact of regional effects relating to the country of origin of the portfolio company, which we achieve by including proxies related to domestic stock market activities and the efficiency of the legal system (legality). The labels and definitions of the variables are outlined in Table 1.

VC Experience: VC Firm Age and Size

Gompers's (1996) grandstanding hypothesis suggests that young VCs lacking proven track records of investment success try to exit their investments speedily to raise their profile among prospective investors in their follow-on funds. Extending Gompers's argument, it is reasonable to expect that grandstanding is most likely to involve exit routes with high public visibility and impact, such as IPOs. Therefore, we might expect younger VCs to be more likely to exit through IPOs. By contrast, Giot and Schwienbacher (2007) argue that more experienced VC backers help facilitate IPO exits through their expertise and connections. Measuring VC

experience by VC age, it is not clear in light of these arguments whether VC age increases or decreases the probability of an IPO exit. Similarly, VC experience (age) may make liquidation more or less likely: On the one hand, more experienced VCs may have superior skills in selecting profitable ventures and adding value to their portfolio companies. On the other, they are likely to spot underperforming portfolio companies relatively early and push for liquidation rather than risk their reputation by selling or floating a low-quality company. The wider network of connections among older VCs is also likely to increase the chances of a trade sale (M&A).

We employ the total amount of capital committed by a VC firm to the companies in its portfolio as an alternate measure of VC experience. Gompers and Lerner (2000) document that the capital committed by a VC indicates its future fund-raising ability, which is linked to the achievement of successful exits. The total amount of funds committed by a VC is used as a measure of experience by Krishna, Ivanov, Masulis and Singh (2011).

VC Fund Age

We expect VC fund age to have a significant impact on the probability and route of exit. Generally, VC funds have a predetermined, limited lifespan of 10 years (Pearce and Barnes 2006; Cumming and Johan 2006) with possible extensions of between one to three years. Hence, as a VC fund approaches the end of its life, the need to exit from its investments becomes ever more urgent. Not only can we expect a positive impact from fund age on exit probability, but the oldest funds should have a particularly high impact on exit probability. We expect this additional fund age effect among the oldest funds to increase the probability of exit for them. It can also be argued that when funds are mature, VC firms may not have the opportunity to choose a successful exit route and hence they might liquidate old funds. We measure VC fund age as the difference between the first investment date recorded in our database for a given fund, and the exit date from the portfolio company.

Size of Investment

The size of the VC investment in a portfolio company is expected to influence the decision to exit the portfolio company. VCs tie up substantial amounts of capital in illiquid investments in portfolio companies. The amount of capital invested influences the expected value, hence a large investment reflects a VC's confidence in the future success of a portfolio company. If VCs have any predictive ability, we would expect the probability of successful exit to increase with investment size. More importantly, we hypothesise that, the larger is the investment size, the higher is the share of IPO exits among successful exits. In the context of time to exit, Giot and Schwienbacher (2007) find that the larger is the investment committed by a VC in a portfolio company, the speedier will be the VC's exit. This indirectly supports the notion that a large capital investment is a reflection of the VC's confidence in the portfolio company.

Size of the VC Syndicate

Syndication allows VCs to diversify investment risk. Syndicate size typically increases as the portfolio company develops and its need for VC funds increases. Several studies (Megginson and Weiss 1991; Lerner 1994a; Brander, Amit and Antweiler 2002; Giot and Schwienbacher 2007) argue that larger syndicates facilitate successful trade-sale and IPO exits by providing valuable contacts, connections and quality certification. Hence, we expect the VC syndicate size to increase the probability of exit through an M&A or IPO. At the same time, a larger syndicate size may also increase the probability of liquidation. A larger syndicate can exert more pressure on the entrepreneur(s) to liquidate an unsuccessful venture. Alternatively, a greater number of VC backers may contribute to the failure of the business as a result of unproductive conflicts and in-fighting among them.

Age of the Portfolio Company

VCs typically invest in relatively young companies. The older is the portfolio company, the more information is available to assess its quality and performance. This is likely to facilitate, in particular, exits through IPOs and trade sales (i.e., M&As). Therefore, we expect the probability of M&A and IPO exits to increase with the age of the portfolio company.

Size of the Portfolio Company

The pre-exit size of a VC-backed company is an obvious determinant of exit probability and method. We expect large companies to be more likely to be exited through an IPO or a trade sale (M&A), while small-sized companies are more likely to be liquidated. We measure the size of a portfolio company as its value after receiving VC financing.

Domestic Market Activity

Differences across countries in terms of the level of domestic stock market activity are likely to influence the probability and the route of exit (Black and Gilson 1998; Cumming, Fleming and Schwienbacher 2006; Cumming and MacIntosh 2003). More active stock markets increase the probability of exit through public markets, i.e., through IPOs. We use three measures of market activity: first, market liquidity, computed as total shares traded on the stock market divided by GDP (Demirguc-Kunt and Levine 1996), second, market to book ratio, defined as a country's specific Morgan-Stanley Capital International (MSCI) market to book ratio, and third, GNP per capita of the country in which the portfolio company is based. Cumming and Johan (2008) find that a high GNP leads to a high probability of exit. All variables are measured in the year prior to the exit year.

Legality

Cumming et al. (2006) find that legality is an important determinant of exit, as more efficient legal systems mitigate agency problems between entrepreneurs and outside investors and facilitate VC exits, specifically via IPOs.[2] Following Cumming et al., we include the legality index developed by Berkowitz, Pistor, and Richard (2003), based on the law and finance variables of La Porta, Lopez-De-Silanes, Shleifer, and Vishny (1998). This index is a weighted average of indicators of the efficiency of the judicial system, the rule of law, corruption, risk of expropriation and contract repudiation, and shareholder rights. A higher legality index reflects a better legal system. Based on the findings of Cumming et al. (2006), we expect to see a positive relation between our legality measure (which varies across countries depending on the quality of the legal system) and the probability of an IPO.

Regional Dummy Variables

To measure any additional effects of country (or region) on exits, over and above market activity and legality, we include regional dummy variables for US/Canada, UK/Ireland, Continental Europe, Latin America and Asia/Africa. We include these dummy variables when estimating the probability of exit for VC investments.

Other Control Variables

We control for industry and year effects. We incorporate intercept dummies for the year of exit. Alternatively, we control for deal year. The results for our variables of interest are qualitatively the same for either method, and below we report only the results based on the exit year.

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[2] Better legal systems are likely to improve the performance of companies operating within their jurisprudence. Improved performance, in turn, may increase the chances of the company conducting an IPO, M&A or MBO, irrespective of the involvement of a VC backer. Therefore, this favourable country effect is probably not limited to our sample of VC-backed companies. Future research involving a control sample of unbacked companies may shed further light on this issue.

IV.   DATA AND METHODOLOGY

Data

The data on VC investments used in this study are collected from VentureXpert and cover the period 1990 through 2010. We impose two sampling criteria. First, in order for an investment to be included in the sample, exit date, size of investments, company value post financing, the fund's first investment date and the founding dates for the portfolio company and the investing VC(s) must be available.[3] Second, for companies with multiple financing rounds, we exclude all but one round to avoid giving undue weight to these sample companies.[4] The final sample with complete data consists of 4033 VC investments backed by 477 UK incorporated VC firms. If VCs exit only partially at an IPO, we classify this as an IPO exit and treat the IPO date as the exit date. We classify the factors that influence exits into variables related to the VC and variables related to the portfolio company and its country or region of origin. Table 1 provides details of variable definitions and units of measure.

[PLEASE INSERT TABLE 1 HERE]

VC-related variables include age of the VC, size of the VC, age of the VC fund, average size of the VC investment and size of the VC syndicate. The age of the VC (VC Reput1) is measured as the logarithm of the difference between the founding date of the VC and the date of the investment. For non-syndicated deals, VC age is measured as the age of the VC firm. The size of the VC (VC Reput 2) is measured as the annual amount committed by the VC firm to all the investments in its portfolio. Young VCs (Bottom25%_Reput1) is equal to one for the youngest 25% of VCs, i.e., observations in the bottom quartile of LnVC Age, and zero otherwise. This interactive term is expected to capture the impact of the presence of young VCs

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[3] We were unable to use any other data sources to collect the missing data for the portfolio companies. The names of these companies were not disclosed and hence it is impossible to seek information on companies with no identity.

[4] In the analyses reported below, we exclude all but the final financing round. Alternatively excluding all but the first stage leaves our results qualitatively unchanged. We have 724 companies with single financing rounds, while the remaining portfolio companies have multiple rounds.

on the probability of a successful exit. Age of the VC fund (LnFund Age) is measured as the logarithm of the difference between the fund's first investment date and the date of exit. TOP25%_LnFund Age equals LnFund Age for the oldest 25% of funds (those in the top quartile of LnFund Age), and zero otherwise. The average size of the VC investment (AVE-LnSize Inv) is the natural logarithm of the average amount invested by the VC backer(s) in the portfolio firm. In cases of non-syndication, we measure the investment size as the amount invested by the VC firm in the portfolio company. Size of the investment syndicate (Synd) is the number of VCs syndicated in a particular investment round. Dummy-Synd is size of syndication interacted with a dummy variable that equals one for old VCs (above the 75th percentile) and zero otherwise.

Our database categorises the financing rounds into four financing stages: startup/seed, early stage, expansion stage and later stage financing. We exclude from our sample financing rounds classified by VentureXpert as 'other' rounds. This is due to the fact that other rounds are rounds undisclosed by the VC firms and can be VC or buyout rounds.[5]

Portfolio company-related variables include company's age, size of the company, and the geographic region of the portfolio company's country of incorporation. Portfolio company age (LnCompany Age) is measured as the logarithm of the time (in years) from the company's founding date to the date of the VC investment. The size of the portfolio company (LnCompany size) is measured as the logarithm of the company's value after financing.

We include three measures of the level of activity of the domestic stock market: the specific country MSCI market to book ratio, market liquidity measured as the total value of shares traded on the stock market divided by GDP, and the (average) aggregate amount invested per annum by the specific VC backer(s) in the country of the portfolio company in the

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[5] We are grateful to the VentureXpert research team for pointing out this issue. We have 217 'other' financing rounds in our sample and, as a robustness check, we treat other rounds as VC investments and alternatively as buyout investments to check the consistency of our estimates. However, the results remain qualitatively the same; thus, we report the results without the other financing rounds.

year prior to the exit year. Information on the MSCI market to book ratio is collected from Bloomberg, and information on market liquidity is collected from the *World-Bank* online database. As a measure of the quality of the legal system, we include the legality index of the country of origin of the portfolio company, as constructed by Berkowitz (2003).The breakdown of the countries and their legality index values are shown in Table 2. Finally, as a measure of economic activity, we include the GNP per capita of the specific country.

[PLEASE INSERT TABLE 2 HERE]

We control for year effects. In the analyses reported below, we include dummy variables for the year of exit. Alternatively including dummies for the deal year leaves our results qualitatively unchanged.[6] Finally, we control for industry effects using the Fama-French 12-industry classification.

Methodology

We estimate an unordered multinomial logit model of the probabilities of alternative VC exit routes, specifically the probabilities of VCs exiting through M&As, IPOs, liquidation and MBOs (using the liquidation outcome as the base case). The multinomial logit approach allows us to examine the likelihood of a VC choosing a specific route relative to other alternative routes. The probability of a VC exiting through a specific route is given by equation (1):

$$P_{ij} = P(\text{Exit} = j \mid X_{it}) = \frac{\text{Exp}(X_{it}\beta_j)}{1 + \sum_{j=1}^{J} \text{Exp}(X_{it}\beta_j)} \qquad (1)$$

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[6] These results are available on request.

where j=1 is an M&A exit, j=2 is an IPO exit and j=3 is an MBO exit; X_{it} is a vector of control variables that influence the probability of an exit through any route. We estimate the following three simultaneous models to examine the likelihoods of VC exits:

$$Ln\left(\frac{P_{M\&A}}{P_{Liquidation}}\right) = X_{it}\beta_{j=1} + \varepsilon_{M\&A} \qquad (2)$$

$$Ln\left(\frac{P_{IPO}}{P_{Liquidation}}\right) = X_{it}\beta_{j=2} + \varepsilon_{IPO} \qquad (3)$$

$$Ln\left(\frac{P_{MBO}}{P_{Liquidation}}\right) = X_{it}\beta_{j=3} + \varepsilon_{MBO} \qquad (4)$$

We use VC age, VC size, fund age, size of investment in the portfolio company, size of the portfolio company after financing, industry dummy, country dummy, market activities in the year prior to exit and the legality index as control variables. A positive β_j means that the relative probability of choosing exit route j increases relative to the probability of choosing the liquidation exit route, which is the base category in the current study. In our analysis, the odds ratio measures the probability of a VC exiting through a given route relative to the probability of a liquidation exit. For instance, an odds ratio of 1.20 means that, for a given value of X_{it}, the probability of exiting through a given route is 20% higher than the probability of an exit via liquidation (the base case). The overall fit of the model is determined by a likelihood ratio test and pseudo R-square. We test the independence of irrelevant alternatives (IIA) using a Hausman test.

V. RESULTS AND ANALYSIS

Descriptive Statistics

Table 3 displays descriptive statistics of the explanatory variables used in our exit analysis based on the filtered sample of 4033 VC investments. The average age of the VCs at the time of investment is over 20 years, with a median of nearly 18 years.[7] The average age of UK VCs is comparable to that reported for US VCs (Giot and Schwienbacher 2007), confirming the established history and experience of the UK VC industry. VC firms invest, on average, approximately £163.74 million annually in all portfolio companies, with a standard deviation of £400 million. This suggests a large variation in the VC investments in the portfolio companies. The average age of the VC funds (as opposed to the VCs managing the funds) at the time of exit is 4.16 years. As funds have a typical lifespan of 10 years, we might expect an average fund age of 5 years if exits are uniformly distributed over the funds' lifespan. The fund age at the 75th percentile is 6 years, indicating that the increase in the need to exit accelerates for old funds (beyond the 75th age percentile).

On average, VCs commit £7.44 million to each portfolio company (based on the statistics on the average investment size). However, the distribution is highly skewed, with a minimum of just £30,000 and a maximum of £89 million; in fact, 50% of VCs invest £3 million (the median) or less. The results show that syndication is common in our sample of UK VCs, as is reported in the US: The mean syndicate size in our sample is 4, while Giot and Schwienbacher (2007) report averages (for US VCs) of nearly 3 syndicate members for the first financing round and 4 for the second. In our sample, more than 50% of investments are made by 3 VC investors and 5% of investments involve more than 13 syndicated investors (based on the 95th percentile shown in Table 3).

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[7] The values used to calculate the statistics for the VC characteristics for syndicated deals are the averages over the syndicate members, i.e., the syndicate average for a given investment round is treated as a single observation rather than multiple observations being used for the same investment round.

The average age of the portfolio companies at the time of investment is over 9 years, but age is highly variable, with a standard deviation of over 7 years. The average portfolio company has a size of almost £45 million, post investment. However, the sizes of the portfolio companies are quite variable across the sample investments, with a standard deviation of nearly £38 million, a minimum outcome involving a size of £500 thousand, and a maximum size of over £112 million. On average, the legality index is 20.09, the market to book ratio is 2.45 and the liquidity is 1.53 across all countries. It is evident that UK VCs invest in countries with very low market liquidity as well as those with high liquidity.

[PLEASE INSERT TABLE 3 HERE]

Table 4 gives a breakdown of the explanatory variables by exit route and portfolio company region. The table shows that the most widely used exit route for VC investments in our sample, with 3163 investment rounds, is the trade sale (M&A), followed by IPOs (536), liquidation (175), and finally MBOs (159). The fact that a large proportion of investments are exited through M&As is consistent with prior studies of European VCs (see, e.g., Schwienbacher 2002; Cumming and Johan 2008). The subsample of IPO exits has, on average, the highest fund age, largest syndicates and highest age of portfolio companies. The liquidation subsample, on the other hand, has the lowest average fund age, the lowest average investment amount and lowest portfolio company age. Liquidation and IPO exits are associated with high market liquidity, suggesting that VC firms tend to liquidate their investments when the market is high. Perhaps realising a loss on an investment is less severe for the VC's reputation when the market is highly liquid. The fact that VC firms time their liquidations is consistent with the 'living dead' phenomenon documented by Gompers and Lerner (2000). In terms of geographical region, UK/Ireland and US/Canada have the highest average amounts invested, followed by Continental Europe. Latin America and Asia/Africa have the oldest portfolio companies, which shows that VCs invest in more mature companies in countries with less

developed financial markets. At the time of exit, market liquidity is higher in US/Canada and UK/Ireland than in Continental Europe, Latin America, and Asia/Africa.

[PLEASE INSERT TABLE 4 HERE]

Table 5 shows the numbers and percentages of investments exited through the various routes. The table shows that M&A exits are more frequent than all other routes. UK/Ireland and Continental Europe have the highest proportions of M&A exits (85.67% vs. 78.85) and the lowest of IPO exits (8.77 % vs. 14.93%). This evidence is consistent with Cumming and Johan (2008), who report a high frequency of M&A exits among Continental European VCs. UK VCs have a higher exit rate through the IPO route in Asia/Africa than in any other region. UK VCs suffer a large percentage of liquidations in US/Canada and the lowest percentage of liquidations in Asia/Africa. Perhaps this is due to the fact that the portfolio companies are younger in US/Canada than in Asia/Africa. Also, it is possible that UK VCs apply a more rigorous screening and selection process to portfolio companies from outside the US and UK.

[PLEASE INSERT TABLE 5 HERE]

Multinomial Estimation Results

Table 6 presents results from an unordered multinomial logit model for all exits: M&A, IPO, liquidation and MBO (using liquidation as the base). We examine the determinants of exit probability using VC, portfolio company and market-related variables. The results show that the probability of liquidation relative to M&A, IPO or MBO exits is higher among young VCs than old VCs. VC experience, as measured by VC age, increases the probability of a successful exit through an M&A or IPO. We find strong evidence that backing by an old fund increases the probability of an exit through an IPO or an M&A. Larger amounts of VC funding increase the probability of a successful exit through an IPO, M&A or MBO. This implies that a large investment in a portfolio company is indicative of VC confidence that a successful exit is

16

possible. The experience of the members of the VC syndicate is crucial, especially if the syndicated members include an experienced VC firm. It is evident that having an experienced VC in the syndicate increases the probabilities of successful exits through IPOs and M&As. Periods of high market to book ratio and market liquidity are associated with a higher probability of a successful exit. Consistent with Cumming et al. (2006), we find that a higher legality index and a high GNP per capita increase the probability of an IPO or M&A exit. The odds ratios are relatively similar between market liquidity and the legality index for all routes. This indicates that both market liquidity and the legal environment are important determinants of the probability of an exit. We find little evidence of residual regional effects, as shown by insignificant coefficients of most of the regional dummy variables (except for the 'Other country' indicator, and US/Canada for MBOs).

Overall, the results demonstrate that VC's experience, size of the investments in a portfolio company, the legal system and market conditions play major roles in influencing exits through IPOs and M&As. Investments outside the UK have a high chance of successful exits compared to domestic investments.

[PLEASE INSERT TABLE 6 HERE]

VCs are likely to make investments in portfolio companies from which they are likely to exit successfully. The amount a VC invests may be determined by the VC's expectations with regard to possible exit routes. As we cannot observe and control for the expected exit route, it is conceivable that investment size is endogenous in our model.[8] To control for possible endogeneity, we use instrumental variable (IV) estimation (in Table 7) using the size and age of the portfolio company, and dummies for the region and financing stage as instruments. Based on a Hausman endogeneity test (not reported), we find strong evidence of endogeneity in the VC investment decision. Comparing the results reported in Tables 6 and 7, we can infer that

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[8] We are grateful to the referee for pointing out the possibility of endogeneity in the VC investment decision.

failure to control for this endogeneity misleadingly heightens the probability of successful (IPO, M&A or MBO) exits relative to liquidations.

The model presented in Table 7 also includes two additional variables to examine the impact of activity (hot markets) in the IPO market and VC industry. Our results show that the dot-com IPO bubble (in 1999-2000) had a positive impact on the probability of an IPO exit but significantly reduced the chances of an MBO. The 2006 peak in the VC industry had a positive impact on all exit routes.

Although the focus of our analysis is the *type* of exit, it is reasonable to expect that type of exit is related to the *time* to exit, as documented by, e.g., Giot and Schwienbacher (2007).[9] VCs are likely to invest more if they expect a successful and quicker exit. To some extent, our above analysis controlling for the endogeneity of investment decisions accounts for the relation between type and *expected* time to successful exit. In terms of *actual* time to exit, periods of higher levels of activity in IPO markets and the VC industry, along with higher market valuations (higher market to book) and market liquidity, are likely to be characterised by quicker exits, which will result in a bunching of exits, i.e. a higher frequency of exits during these periods. This further explains our finding of significant impacts of IPO market and VC industry activity in Table 7.

[PLEASE INSERT TABLE 7 HERE]

Table 8 presents the results of a more in-depth examination of the impact of market liquidity on exits. Although Table 7 shows that a high market liquidity increases the likelihood of all successful exits as compared to exits through the liquidation route, it is not clear whether this relationship is a temporal or a cross-sectional effect. In other words, is it due to variations in liquidity over time or differences in liquidity between regions?[10] To address this issue, we split our measure of market liquidity into a temporal and a cross-sectional component. We

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[9] We are grateful to the referee for pointing out this issue.
[10] We are grateful to the referee for pointing out this issue.

define a time dummy to measure periods of above-average liquidity, coded one when market liquidity is above the time-series median and zero otherwise. We interact this time dummy with market liquidity to capture the temporal effect. The residual cross-sectional effect is reflected in the coefficient of the uninteracted market liquidity variable. We find that both the temporal and the cross-sectional effects of market liquidity increase the probability of IPO or M&A exits. To shed light on whether the cross-sectional effect dominates the temporal effect, we use the F-test to measure the difference between the coefficient estimates for market liquidity and the interaction term. We find that the difference is significant with a chi-square of 8.90 (p-value 0.002). This suggests that the cross-sectional effect dominates the temporal effect.

Overall, the results show that VC experience and market liquidity, both temporal and cross-sectional, are important determinants of the probability of a successful exit.

[PLEASE INSERT TABLE 8 HERE]

Robustness Tests

We test the robustness of our results using different measures of VC age, fund age, investment size, market liquidity, and the effect of a syndication of a similar VC age . We use VC age (in the case of syndication) measured as the oldest VC instead of the average age of the syndicate members. Similarly, for fund age, we use the age of the oldest fund rather than the syndicate average. We measure the investment size for syndicates as the largest syndicate investment instead of the syndicate average. We define market liquidity as the total value of shares traded divided by market capitalisation, as opposed to GDP. Our results are robust to using these alternative measures, and remain qualitatively unchanged. We also test the robustness of our results using clustering in pre- and post-crisis years, and find that the coefficients are relatively stable.

VI.   CONCLUSION

We investigate the exit behaviour of UK VCs from investments in portfolio companies located both in the UK and abroad. We examine the frequency of alternate exit routes, specifically trade sales (M&As), stock-market flotations (IPOs), MBOs and liquidations (write-offs). Our analysis seeks to explain the exit choice in terms of the characteristics of the VC backer, the portfolio company, market conditions and the quality of the legal system in the portfolio company's country of origin. We find that UK VC firms choose to exit UK investments through different routes than investments elsewhere. M&A exits are more commonly used to exit UK investments, while the frequency of IPO exits is substantially lower among UK investments than those elsewhere.

Our results show that these country differences can largely be explained in terms of the experience of the VC backer, the age of the VC fund, investment size, market and economic conditions, and the quality of the legal system in the portfolio company's country of origin. Successful exits are more likely at times when, and in countries where, the stock market is highly liquid. Market liquidity plays an important role in facilitating exits through all routes and this effect is both temporal and cross-sectional. The greater is the investor protection provided by the legal system of the company's country of origin, the more likely is exit through an IPO or M&A. A one-unit increase in the legality index increases the probability of an IPO exit by up to 34% and that of an M&A exit by up to 38%. The probability of a successful exit also increases with a higher valuation of the stock market (relative to book values) and higher GNP per capita.

Our results on the importance of legality are in line with previous findings by Cumming et al. (2006). However, while Cumming et al. find no direct effect of stock market liquidity on VC exit choices (except indirectly through the relation between stock market development and

legality), we report a significant direct impact of economic and market conditions and of the development (liquidity) of the stock market on VC exit routes.

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Table 1: Definitions of variables

Variable	Definition of variable and unit of measurement
VC Reput 1	VC age measured in years as the difference between the founding date and the date of investment.
VC Reput 2	Annual amount committed by the VC firm to all the investments in its portfolio
Bottom25%_Reput	A binary dummy variable coded 1 for observations in the 25th percentile interacted with VC Reput1 or Reput2 and zero otherwise.
Fund Age	Fund age measured in years as the difference between fund first investment date and date of exit.
TOP25%_LnFund Age	Fund age of the oldest 25% of funds, measured as fund age interacted with a binary dummy variable coded 1 for observations with fund age above the 75th percentile and zero otherwise.
AVE-LnSize Inv	The average amount the VC invested in a portfolio company (in millions of 2006 GBP).
AVE-LnSize Inv(IV)	Measured as the predicted value of average amount the VC invested regressed on company size, company age, region of a portfolio company and financing stage.
Synd (#)	The number of VCs syndicated in financing a portfolio company.
Dummy-Synd	Dummy-Synd is size of syndication interacted with dummy variable that equals to 1 for old VCs (above 75th percentile) and 0 otherwise.
Company Age	Age of a portfolio company measured in years as the difference between founding date and date of investment round.
Company Size	Company size of a portfolio company post financings ((in millions of 2006 GBP).
MTB	Portfolio company country specific MSCI market to book ratio.
Market_liquid	Market liquidity measured as a ratio of country total value of shares traded on stock exchange divided by GDP.
Aggregate amount	The aggregate annual amount invested by all VCs in the region of the portfolio company measured in the year prior to the exit year.
Legality Index	The weighted average (based on Berkowitz et al. 2003) of efficiency of judicial system, rule of law, corruption, risk of expropriation, and risk of contract repudiation (La Porta et al. 1998).
GNP	The GNP per capita of the country in which the portfolio company is based.
Time-dummy	Is a dummy variable taking a value of 1 if market liquidity in a region of a portfolio company in a given year is above median and zero otherwise.
Hot-Market 1 Bubble	Dummy variable taking a value of 1 during the internet bubble (1999-2000) and 0 otherwise
Hot-Market 2 Peak (2006)	Dummy variable taking a value of 1 during the VC market peak (2006) and 0 otherwise
IPO	Refers to partial or full exit through an Initial Public Offering.
M&A	Refers to exit through a trade sale
MBO	Refers to exit where the management of the company buys shares from VCs
Liquidation	Refers to the investments that have been liquidated
Country	Binary dummies indicating the country (or region) of origin of portfolio companies for the following regions: • US & Canada • UK and Ireland • Continental Europe • Other country includes Latin America and Asia and Africa

Table 2: Legality index by country

This table shows the legality index by country of portfolio companies. The index is constructed as a weighted average of the indicators from La Porta et al. 1998 (as in Berkowitz et al. 2003). Legality index=0.381*(Efficiency of Judiciary) + 0.5778*(Rule of Law) + 0.5031*(Corruption) + 0.3468*(Risk of Expropriation) + 0.3842*(Risk of Contract Repudiation).

Country	Efficiency of judicial system	Rule of law	Corruption	Risk of expropriation	Risk of contract repudiation	Legality index
Argentina	6.00	5.35	6.02	5.91	4.91	12.34
Australia	10.00	10.00	8.52	9.27	8.71	20.44
Austria	9.50	10.00	8.57	9.69	9.60	20.76
Belgium	9.50	10.00	8.82	9.63	9.48	20.82
Brazil	5.75	6.32	6.32	7.62	6.30	14.09
Canada	9.25	10.00	10.00	9.67	8.96	21.13
Chile	7.25	7.02	5.30	7.50	6.80	14.70
Denmark	10.00	10.00	10.00	9.67	9.31	21.55
Egypt	6.50	4.17	3.87	6.30	6.05	11.34
Finland	10.00	10.00	10.00	9.67	9.15	21.49
France	8.00	8.98	9.05	9.65	9.19	19.67
Germany	9.00	9.23	8.93	9.90	9.77	20.44
Greece	7.00	6.18	7.27	7.12	6.62	14.91
Hong Kong	10.00	8.22	8.52	8.29	8.82	19.11
India	8.00	4.17	4.58	7.75	6.11	12.80
Indonesia	2.50	3.98	2.15	7.16	6.09	9.16
Ireland	8.75	7.80	8.52	9.67	8.96	18.92
Israel	10.00	4.82	8.33	8.25	7.54	16.54
Italy	6.75	8.33	6.13	9.35	9.17	17.23
Japan	10.00	8.98	8.52	9.67	9.69	20.36
Kenya	5.75	5.42	4.82	5.98	5.66	12.00
Malaysia	9.00	6.78	7.38	7.95	7.43	16.67
Mexico	6.00	5.35	4.77	7.29	6.55	12.82
Netherlands	10.00	10.00	10.00	9.98	9.35	21.67
Nigeria	7.25	2.73	3.03	5.33	4.36	9.39
Norway	10.00	10.00	10.00	9.88	9.71	21.78
Philippines	4.75	2.73	2.92	5.22	4.8	8.51
Portugal	5.50	8.68	7.38	8.90	8.57	17.20
Singapore	10.00	8.57	8.22	9.30	8.86	19.53
South Africa	6.00	4.42	8.92	6.88	7.27	14.51
South Korea	6.00	5.35	5.30	8.31	8.59	14.23
Spain	6.25	7.80	7.38	9.52	8.40	17.13
Sri Lanka	7.00	1.90	5.00	6.05	5.25	10.40
Sweden	10.00	10.00	10.00	9.40	9.58	21.56
Switzerland	10.00	10.00	10.00	9.98	9.98	21.91
Taiwan	6.75	8.52	6.85	9.12	9.16	17.62
Turkey	4.00	5.18	5.18	7.00	5.95	11.84
UK	10.00	8.57	9.10	9.71	9.63	20.41
US	10.00	10.00	8.63	9.98	9.00	20.85

Table 3: Summary statistics of explanatory variables

The sample consists of investments in portfolio companies and covers the period 1990–2010. The table shows mean, median, standard deviation, the 25th, 75th and 95th percentiles, and maximum and minimum values of the continuous explanatory variables for a sample of 4033 venture capital investments. VC Reput 1 is the age of venture capital firms measured as the difference between founding date and date of investment in a portfolio company. VC Reput 2 is the amount a VC firm to all the investments in its portfolio. Fund age is the age of fund, measured as the difference between fund first investment date and date of exit. AVE Size Inv is the average size of investment by VC firm in a portfolio company. Synd is the number of VC firms participated in financing a portfolio company. Company age is the difference between company founding date and date of receiving investments from a VC company. Company size post round is the value of a portfolio company post receiving financing. Legality index is an index of law in a country of a portfolio company. Market to book, is MSCI market to book value for a country of a portfolio company. Market Liquidity is measured as a ratio of total value of share traded divided by GDP. GNP denotes GNP per capita of the country in which the portfolio company is based.

Variables	Full sample							
	Mean	**Median**	**STD**	**25th Percentile**	**75th Percentile**	**95th Percentile**	**Max.**	**Min.**
***Continuous variables* for VC**								
VC Reput 1	20.67	18.00	17.54	7.00	26.00	57.00	126.00*	4.00
VC Reput 2	163.74	26.70	400.67	6.92	206.89	239.68	991.43	0.16
Fund Age (years)	4.16	3.83	2.75	1.42	6.00	9.18	11.99	2.00
AVE Size Inv (£m)	7.44	3.00	2.83	1.15	6.24	23.60	89.30	0.03
Synd (#)	4.26	3.00	4.19	1.00	6.00	13.00	33.00	1.00
Company Age (years)	9.32	7.00	15.23	2.00	10.00	25.00	241.00	1.00
Company size post round (£m)	44.57	36.50	38.74	36.50	47.50	54.93	112.48	0.50
Legality index	20.09	20.41	1.75	20.41	20.85	21.13	21.91	9.39
Market to book	2.45	2.44	0.50	2.22	2.65	3.26	3.61	1.00
Market Liquidity	1.53	1.27	0.94	0.82	2.00	3.31	7.55	0.00
GNP	30711	22180	9159	14698	24860	44520	71520	574

*This is Martin Currie Investment Management LTD, founded in 1881.

Table 4: Continuous variables by region, financing stage, industry, and exit route

This table shows the mean values of the continuous variables by exit route, geographic region of a portfolio company, financing stage and industry. M&A is exit through trade sales, IPO is the exit through Initial Public Offering, MBO is the exit through MBO method and Liquidations is the liquidated investments The definitions of the variables are similar to that of table 3. VC Age is the age of venture capital firms measured as the difference between founding date and date of investment in a portfolio company. VC Reput 2 is the annual amount committed by the VC firm to all the investments in its portfolio. Fund age is the age of fund, measured as the difference between fund first investment date and date of exit. AVE Size Inv is the average size of investment by VC firm in a portfolio company. Synd is the number of VC firms participated in financing a portfolio company. Company age is the difference between company founding date and date of receiving investments from a VC company. Company size post round is the value of a portfolio company post receiving financing. Legality index is an index of law in a country of a portfolio company. Market to book, is MSCI market to book value for a country of a portfolio company. Market Liquidity is measured as a ratio of total value of share traded divided by GDP.

Variables	N	VC Reput1 (Years)	VC Reput 2 (£m)	Fund Age (Years)	AVE Size Inv (M)	Syndicate Size (#)	Company Age (years)	Company size post round (£m)	Legality index	Market to book	Market Liquidity
Breakdown of VC investments by exit route country of Portfolio company, Financing stage and High-tech vs. low-tech											
M&A	*3163*	20.08	196.81	4.07	6.01	4.00	8.87	43.82	20.16	2.44	1.54
IPO	*536*	21.45	209.08	4.66	13.43	5.97	11.63	47.85	19.90	2.43	1.83
MBO	*159*	30.89	254.23	3.69	18.15	2.09	11.77	44.48	18.74	2.37	1.46
Liquidation	*175*	19.67	339.23	3.40	5.24	5.73	8.19	48.09	20.57	2.75	1.89
Geographic region of portfolio											
UK & Ireland	*1870*	18.72	132.37	3.92	15.82	2.55	9.57	44.79	20.89	2.39	1.60
US and Canada	*1166*	16.11	168.71	5.01	15.27	7.69	7.52	45.50	21.92	2.34	2.11
Continental Europe	*643*	33.28	455.35	4.54	9.33	3.94	10.72	43.36	20.18	2.43	0.86
Latin America	*40*	18.45	166.11	4.14	5.94	3.11	15.31	36.46	15.76	2.21	0.09
Asia and Africa	*314*	26.90	159.81	3.97	6.29	3.02	11.21	42.45	15.87	2.37	0.86
Financing stage											
Early	*1313*	21.30	159.98	4.12	4.33	3.68	7.30	40.35	20.30	2.41	1.56
Expansion	*2246*	17.69	220.42	4.28	6.73	4.24	9.65	42.00	20.08	2.41	1.49
Later stage	*474*	18.18	132.77	4.86	8.29	7.41	9.91	53.95	20.14	2.21	1.92
Industry											
High-tech	*2600*	20.43	207.13	4.43	13.32	4.42	10.64	44.08	20.07	2.38	1.53
Non-high-tech	*1433*	20.78	211.00	4.13	20.67	2.88	17.86	42.96	19.99	2.39	1.43

Table 5: Descriptive statistics of exit routes

This table shows the proportion of investments that are exited via M&A, IPO, MBO and liquidation. The table shows VC investments from 1990 through 2010. The exit route is tabulated by number of observations and percentage of observations.

Variables		Number of observations by exit route				Percentage of observations by exit route (%)			
Breakdown of VC investments by geographic region of portfolio company	*N*	M&A Exit	IPO Exit	MBO	Liqui-dation	M&A Exit	IPO Exit	MBO	Liqui-dation
UK & Ireland	*1870*	1,602	164	61	43	85.67	8.77	3.26	2.30
US & Canada	*1166*	822	203	33	108	70.50	17.41	2.83	9.26
Continental Europe	*643*	507	96	19	21	78.85	14.93	2.95	3.27
Latin America	*40*	31	7	2	-	77.50	17.50	5.00	-
Asia & Africa	*314*	201	66	44	3	64.01	21.02	14.01	0.96

Table 6: Estimation of probability of exit

This table presents estimates of a multinomial logit model. The variables are classified into VC related variables, portfolio related variables and market related variables. VC Reput 1 is VC age measured in years as the difference between the founding date and the date of investment. The variables are defined in table 1. The values in the brackets are *p*-values based on clustered standard errors to correct for within group correlations. Asterisks ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

Variables	Multinomial logit					
	M&A exits		**IPO exits**		**MBO exits**	
	Coef.	**Odds ratio**	**Coef.**	**Odds ratio**	**Coef.**	**Odds ratio**
VC related variables						
Constant	-2.477		-4.924		-6.648**	
	(0.687)		(0.409)		(0.015)	
VC Reput 1	0.668***	1.950	0.785***	2.192	-0.028	0.972
	(0.000)		(0.000)		(0.935)	
Bottom25%_VC Reput 1	-0.215*	0.807	-0.268**	0.765	-0.466**	0.628
	(0.084)		(0.032)		(0.015)	
LnFund Age	-0.375	0.687	-0.399	0.671	0.685	1.984
	(0.280)		(0.254)		(0.146)	
TOP25%_LnFund Age	0.466**	1.594	0.575***	1.777	-0.491*	0.612
	(0.018)		(0.001)		(0.077)	
AVE-LnSize Inv	0.660***	1.935	0.891***	2.438	0.915***	2.497
	(0.001)		(0.000)		(0.002)	
Synd	-0.084**	0.919	-0.012	0.988	-0.432***	0.649
	(0.011)		(0.765)		(0.000)	
Dummy-Synd	0.148***	1.160	0.144**	1.155	0.010	1.010
	(0.005)		(0.017)		(0.943)	
Portfolio company related variables						
LnCompany Age	-0.135	0.874	-0.007	0.993	-0.325**	0.723
	(0.195)		(0.946)		(0.045)	
LnCompany size	0.012	1.012	0.021	1.021	0.203***	1.225
	(0.473)		(0.356)		(0.000)	
Market related variables						
Ln MTB	0.045***	1.046	0.031***	1.031	0.023	1.023
	(0.002)		(0.007)		(0.180)	
Market_liquid	0.247***	1.280	0.236***	1.266	0.379***	1.461
	(0.000)		(0.000)		(0.000)	
Aggregate amount	0.001	1.001	0.006**	1.006	-0.001	0.999
	(0.956)		(0.036)		(0.821)	
Ln Legality	0.219*	1.245	0.190**	1.209	0.250	1.284
	(0.056)		(0.044)		(0.168)	
Ln GNP	0.371**	1.449	0.340**	1.405	0.340**	1.405
	(0.033)		(0.031)		(0.046)	
US&Canada-dummy	0.038	1.039	-0.522	0.593	2.289*	9.865
	(0.963)		(0.515)		(0.081)	
Cont.Euro-dummy	-0.496	0.609	-0.929	0.395	0.328	1.388
	(0.405)		(0.127)		(0.726)	
Other country-dummy	2.439**	11.462	2.103**	8.191	4.001**	54.653
	(0.035)		(0.043)		(0.040)	
Financing stage, Year and Industry dummy	Yes		Yes		Yes	
Pr(Exit=j|X_{it})	0.867		0.115		0.012	
Pseudo R^2	0.247					
No. obs.	*4033*					

Table 7: Estimation of probability of exit: Impact of Endogeneity and market activity

This table presents estimates of a multinomial logit model. As in Table 6, the variables are classified into VC related variables, portfolio related variables and market related variables. Unlike in Table 6, average investment size in this model is adjusted for endogeneity (see Table 1). Also unlike in Table 6, the measure of VC experience here is VC Reput 2 based on total capital committed by the VC firm to investments in all its portfolio companies. All variables are defined in Table 1. The values in the brackets are p-values based on clustered standard errors to correct for within group correlations. Asterisks ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

Variables	Multinomial logit					
	M&A exits		IPO exits		MBO exits	
	Coef.	Odds ratio	Coef.	Odds ratio	Coef.	Odds ratio
VC related variables						
Constant	3.727		0.919		-8.409**	
	(0.409)		(0.839)		(0.012)	
VC Reput 2	0.659***	1.933	0.775***	2.171	-0.005	0.995
	(0.000)		(0.000)		(0.987)	
Bottom25%_VC Reput 2	-0.210*	0.811	-0.263**	0.769	-0.526***	0.591
	(0.089)		(0.038)		(0.006)	
LnFund Age	-0.671**	0.511	-0.659*	0.517	0.435	1.545
	(0.025)		(0.057)		(0.348)	
TOP25%_LnFund Age	0.605***	1.831	0.698***	2.010	-0.404	0.668
	(0.001)		(0.000)		(0.110)	
AVE-LnSize Inv(IV)	0.193*	1.213	0.367***	1.443	0.042	1.043
	(0.080)		(0.002)		(0.917)	
Synd	-0.080**	0.923	-0.008	0.992	-0.461***	0.631
	(0.016)		(0.848)		(0.000)	
Dummy-Synd	0.140***	1.150	0.136**	1.146	0.040	1.041
	(0.009)		(0.026)		(0.783)	
Portfolio company related variables						
LnCompany Age	-0.121	0.886	0.022	1.022	-0.346**	0.708
	(0.146)		(0.819)		(0.022)	
LnCompany size	0.020	1.020	0.028	1.028	0.208***	1.231
	(0.240)		(0.231)		(0.000)	
Market related variables						
Ln MTB	0.048***	1.049	0.041***	1.042	0.017	1.017
	(0.003)		(0.001)		(0.413)	
Market_liquid	0.224***	1.251	0.218***	1.244	0.358***	1.430
	(0.000)		(0.000)		(0.000)	
Aggregate annual _amount.	-0.001	0.999	0.003	1.003	-0.001	0.999
	(0.879)		(0.320)		(0.899)	
Ln Legality	0.188*	1.207	0.166**	1.181	0.227	1.251
	(0.093)		(0.045)		(0.220)	
Ln GNP	0.236	1.266	0.228	1.256	0.297	1.346
	(0.187)		(0.168)		(0.106)	
Hot-Market 1 Bubble	0.052	0.949	0.643**	1.902	-6.500***	0.002
	(0.902)		(0.020)		(0.000)	
Hot-Market 2 Peak (2006)	3.493***	32.884	3.448***	31.437	2.750**	15.643
	(0.000)		(0.000)		(0.021)	
US&Canada-dummy	0.394	1.483	0.006	1.006	2.416*	11.201
	(0.616)		(0.994)		(0.068)	
Cont.Euro-dummy	-0.372	0.689	-0.512	0.599	0.360	1.433
	(0.581)		(0.444)		(0.727)	
Other country-dummy	1.399	4.051	1.559*	4.754	3.055**	21.221
	(0.176)		(0.094)		(0.047)	
Financing stage, Year and Industry dummy	Yes		Yes		Yes	
Pr(Exit=j|X$_{it}$)	0.867		0.115		0.012	
Pseudo R^2	0.303					
No. obs.	*4033*					

Table 8: Estimation of probability of exit: Temporal vs. Cross sectional market liquidity

This table presents estimates of a multinomial logit model focusing on temporal versus cross sectional effects of market liquidity by including two additional variables: Time-dummy and Time-dummy interacted with market liquidity, as defined in Table 1. For all other variable definitions, see Table 1. The values in the brackets are *p*-values based on clustered standard errors to correct for within group correlations. Asterisks ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

Variables	Multinomial logit					
	M&A exits		**IPO exits**		**MBO exits**	
	Coef.	**Odds ratio**	**Coef.**	**Odds ratio**	**Coef.**	**Odds ratio**
VC related variables						
Constant	2.764		-3.472		-6.237***	
	(0.544)		(0.510)		(0.002)	
VC Reput 2	0.017***	1.017	0.014**	1.014	-0.016***	0.984
	(0.000)		(0.015)		(0.008)	
Bottom25%_VC Reput 2	-0.050	0.951	-0.151**	0.860	-0.301	0.740
	(0.561)		(0.047)		(0.129)	
LnFund Age	0.136	1.146	0.02	1.020	0.478	1.613
	(0.681)		(0.958)		(0.345)	
TOP25%_LnFund Age	0.431**	1.539	0.578***	1.782	-0.291	0.748
	(0.034)		(0.005)		(0.289)	
AVE-LnSize Inv(IV)	0.428***	1.534	0.641***	1.898	-0.048	0.953
	(0.000)		(0.000)		(0.921)	
Synd	-0.014	0.986	0.080*	1.083	-0.517***	0.596
	(0.666)		(0.086)		(0.000)	
Dummy-Synd	0.007	1.007	0.034	1.034	0.239	1.270
	(0.866)		(0.450)		(0.135)	
Portfolio company related variables						
LnCompany Age	-0.092	0.912	0.036	1.037	-0.17	0.844
	(0.218)		(0.680)		(0.254)	
LnCompany size	0.014	1.014	0.023	1.023	0.188***	1.207
	(0.487)		(0.336)		(0.000)	
Market related variables						
Ln MTB	0.036**	1.037	0.022**	1.022	0.030*	1.030
	(0.011)		(0.039)		(0.076)	
Market_liquid	0.173***	1.189	0.864***	2.373	0.244***	1.276
	(0.000)		(0.000)		(0.010)	
Time-dummy **X** Market_liquid	0.113***	1.119	0.188**	1.207	0.122	1.123
	(0.001)		(0.041)		(0.180)	
Time-dummy	2.539***	12.667	0.357	1.429	1.306	3.691
	(0.000)		(0.698)		(0.150)	
Aggregate annual _amount.	0.001	1.001	0.008***	1.008	-0.002	0.998
	(0.653)		(0.002)		(0.726)	
Ln Legality	0.323**	1.381	0.297**	1.346	0.202	1.224
	(0.032)		(0.012)		(0.363)	
Ln GNP	0.450***	1.568	0.779***	2.179	0.469***	1.598
	(0.004)		(0.000)		(0.003)	
US&Canada-dummy	-0.829	0.436	1.807**	6.092	0.688	1.990
	(0.375)		(0.025)		(0.612)	
Cont.Euro-dummy	-0.339	0.712	-0.126	0.882	0.403	1.496
	(0.575)		(0.858)		(0.633)	
Other country-dummy	1.398**	4.047	2.117***	8.306	2.994**	7.345
	(0.049)		(0.005)		(0.012)	
Financing stage, Year and Industry dummy	Yes		Yes		Yes	
Pr(Exit=j|X$_{it}$)	0.867		0.115		0.012	
Pseudo R^2	0.313					
No. obs.	*4033*					

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	VC Reput 1	1																			
2	VC Reput 2	-0.526	1																		
3	Bottom25%_VC Reput	-0.246	0.356	1																	
4	LnFund Age	0.208	-0.211	0.007	1																
5	TOP25%_LnFund Age	0.082	-0.106	0.033	0.657	1															
6	AVE-LnSize Inv (IV)	0.030	-0.267	-0.038	0.068	0.012	1														
7	Synd	-0.023	-0.012	0.032	0.281	0.212	0.028	1													
8	Dummy-Synd	-0.391	0.244	0.483	0.168	0.167	0.007	0.631	1												
9	LnCompany Age	0.050	-0.034	-0.002	-0.028	-0.018	-0.063	-0.135	-0.100	1											
10	LnCompany size	-0.012	0.025	-0.006	-0.019	-0.023	0.032	-0.025	-0.030	-0.058	1										
11	Ln MTB	-0.045	0.186	0.038	0.242	0.054	-0.020	0.089	0.054	0.014	-0.005	1									
12	Market_liquid	0.002	0.029	0.027	-0.146	-0.143	-0.050	-0.508	-0.296	0.082	0.017	-0.065	1								
13	Time-dummy X Liquidity	0.027	0.082	-0.090	-0.062	-0.043	0.046	-0.025	-0.065	-0.006	-0.014	0.048	0.261	1							
14	Time-dummy	0.003	-0.112	0.081	0.045	0.027	0.004	-0.032	0.018	0.038	0.002	-0.023	0.330	-0.843	1						
15	Aggregate annual _amount.	0.144	-0.190	-0.001	0.193	0.127	0.024	0.269	0.157	0.038	-0.024	0.264	-0.350	-0.242	0.309	1					
16	Ln Legality	-0.054	0.081	0.031	0.038	0.045	-0.127	0.164	0.129	-0.100	0.020	-0.025	-0.263	-0.008	-0.265	-0.211	1				
17	Ln GNP	-0.040	0.075	0.020	0.149	0.110	0.020	0.367	0.231	-0.075	-0.004	0.099	-0.715	0.314	-0.413	0.013	0.424	1			
18	US&Canada-dummy	-0.073	-0.003	0.083	0.184	0.161	0.014	0.520	0.369	-0.080	-0.002	0.057	-0.829	-0.165	0.066	0.399	0.292	0.611	1		
19	Cont.Euro-dummy	0.215	-0.288	-0.170	0.038	0.014	-0.046	-0.041	-0.124	0.032	-0.022	-0.048	0.198	-0.164	0.222	0.291	0.020	-0.237	-0.273	1	
20	Other country-dummy	0.051	-0.097	-0.037	-0.037	-0.030	0.133	-0.090	-0.078	0.078	-0.013	0.009	0.157	-0.069	0.258	0.346	-0.757	-0.463	-0.195	-0.130	1