

Contracts and Exits in Venture Capital Finance

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Using a sample of European venture capital (VC) investments, I study the relation between VC contracts and exits. The data indicate that ex ante, stronger VC control rights increase the likelihood that an entrepreneurial firm will exit by an acquisition, rather than through a write-off or an IPO. My findings are robust to controls for a variety of factors, including endogeneity and cases in which the VC preplans the exit at the time of contract choice. My findings are consistent with control-based theories of financial contracting, such as Aghion and Bolton (1992). (*JEL* G24, G32, G33, G34)

Venture capital (VC) financial contracts separately allocate cash flow and control rights (Gompers 1998; Hart 2001; Kaplan and Strömberg 2003). In these contracts, the control rights might include the right to replace the CEO, among various other specific veto and control rights. Because entrepreneurs are likely to enjoy the private benefits of being the CEO of a publicly listed firm (Berglöf 1994; Black and Gilson 1998; Bascha and Walz 2001; Hellmann 2006), even when an acquisition is financially superior to an IPO, an entrepreneur might prefer the IPO because of the private benefits. Therefore, the structure of entrepreneurial private benefits leads to two empirical predictions. First, if a venture is less promising and/or the likelihood of a conflict in exit choice is high, then in exchange for getting the venture financed, venture capitalists (VCs) will receive more control rights. Second, strong VC control should be associated with a greater probability of an acquisition. In this article I address the first prediction by controlling for the endogeneity of contracts

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vis-à-vis exits. I focus on the second empirical prediction through empirical testing.

In this article I use a new data set to produce results that relate the characteristics of VC contracts to the means by which a VC exits. The VC IPO-and-acquisition transactions span the years 1996–2005 and eleven European countries (Austria, Belgium, the Czech Republic, Denmark, France, Germany, Italy, The Netherlands, Poland, Portugal, and Switzerland). The data include detailed and confidential information on 223 investments. Of these investments, there are 187 actual dispositions (32 IPOs, 74 acquisitions, 17 buybacks, and 64 write-offs) and 36 investments that had not exited by December 2005, at the time of this study. In ascertaining the role of VC control rights in an IPO or acquisition, I control for a number of potentially relevant factors, including investor characteristics, entrepreneurial firm characteristics, transaction-specific characteristics, market sentiment, and institutional variables.

My results, which are robust and economically and statistically significant, indicate that strong VC control rights are associated with a higher probability of acquisitions and a lower probability of IPOs and write-offs. The data indicate that VC board control and the right to replace the founding entrepreneur as CEO are associated with a 30% greater likelihood of an acquisition. Also, the probability of an acquisition exit is higher if the VC uses other control rights. I show that a VC's use of common equity is associated with weak VC control rights, in contrast to convertible debt or convertible preferred equity. I find that this use of common equity is associated with a 12% greater likelihood of an IPO. Write-offs are approximately 30% less likely when VCs use specific veto and control rights, including the right to replace the founding entrepreneur as CEO. My empirical specifications show that my results are robust to controls for endogeneity of contracts vis-à-vis exits. The unique data also enable me to show, among a wide range of other robustness checks, robustness to the exclusion of cases in which the investor had a clear exit objective at the time of contract.

This article is organized as follows. Section 1 develops testable hypotheses in the context of prior research. Section 2 summarizes and explains the variables used to test the theory. Section 3 presents the data. Section 4 provides multivariate empirical tests with a number of robustness checks. Section 5 concludes the article.

1. Hypotheses

In the literature, related work has well established that VCs contribute significantly to innovation and economic growth (Gompers and Lerner 1999, 2001a, 2001b; Kortum and Lerner 2000; Lerner 2002; Keuschnigg and Nielsen 2003; Gompers, Lerner, and Desai 2003; Gompers, Lerner, and Scharfstein 2005). The success of VC-backed companies has been attributed to the certification and the professional governance provided by VCs (Baker and Gompers 2003;

Hochberg 2005). Thus, VCs play an important role in the going-public process, and VC-backed IPOs tend to perform better than non-VC-backed IPOs. In recent years, research such as Sahlman (1990); Gompers (1998); Kaplan and Strömberg (2003, 2004); Cumming (2005); and Cumming and Johan (2007b, 2007c) has shown that good VC governance is facilitated by strong VC contracts, and that the allocation of control rights between VCs and entrepreneurs is consistent with the incomplete contracting theory of Aghion and Bolton (1992). However, with the exception of Lerner's (1995) paper relating board rights to executive turnover, no empirical study has actually tied investor control rights to investment outcomes.¹ This article provides such a link by examining VC control rights in relation to the acquisition-versus-IPO choice.

1.1 VC control rights

Aghion and Bolton (1992) analyze the contracting problem associated with the entrepreneur who derives private benefits (as distinct from monetary benefits from the venture) from running the firm. Obviously, such private benefits cannot be transferred or pledged to investors. Aghion and Bolton show that any action that maximizes monetary benefits does not necessarily maximize private benefits, and might be different from the first-best action that maximizes total surplus. Hence, if the entrepreneur has control and has pledged monetary benefits to investors, he or she has an incentive to act so as to maximize private benefits. If investors have control, then they will try to maximize monetary benefits. Since investors have deep pockets, they can always bribe the entrepreneur into taking the efficient action; however, the opposite is not true. As a result, the entrepreneur's control is always *ex post* efficient, but investor control can lead to *ex post* inefficiencies. *Ex ante* control might have to be transferred to investors so that they can break even, especially in ventures for which the expected monetary benefits are relatively low.

In the VC setting, Berglöf (1994); Black and Gilson (1998); Bascha and Walz (2001); Hellmann (2006); De Bettignies (2008); and others hypothesize that entrepreneurs' private benefits are higher when the firm is taken public compared to when it is acquired (see Petty, Martin, and Kensinger 1999 for case studies). VC control rights are relevant in the acquisition-versus-IPO exit decision because of the private benefits that the entrepreneur enjoys, which might go beyond the financial rewards he or she obtains from the entrepreneurial venture. Entrepreneurs are likely to obtain private benefits in an IPO through the gain in reputation associated with being the CEO of a publicly listed firm. In contrast, VCs are not likely to enjoy private benefits. VCs are less actively involved in an investee firm that has been taken public, and they exit within six months to two years, and/or they transfer their shares to their institutional limited partners (Gompers and Lerner 1999). In an acquisition exit, both the VC

¹ Lerner (1995) studies CEO replacement, not exit outcomes. For legal scholarship on contracts and VC exits, see Smith (2005) and Broughman and Fried (2007).

and the entrepreneur sell their shares to the acquiring firm and the entrepreneur is no longer the CEO. Thus, the scope of an entrepreneur's private benefits in an acquisition exit is likely to be smaller than if the firm had exited through an IPO.

Situations in which entrepreneurs enjoy private benefits lead me to make two empirical hypotheses. First, in the original contract, higher NPV ventures will be associated with a higher degree of entrepreneur control, since investors will likely break even despite not having control. This result has been tested in previous VC contracting studies (Kaplan and Strömberg 2003; Cumming 2005; Cumming and Johan 2007c). When the venture is extremely promising, VCs will seek and receive fewer control rights. If the venture is less valuable to begin with, and/or the likelihood of a conflict in exit choice is higher, then the VC will seek and receive more control rights, which the entrepreneur will grant in order to get the venture financed. I address this issue in this article by controlling for the endogeneity of contracts vis-à-vis exits.

Second, those ventures in which the VCs are in control are likelier to result in actions, i.e., acquisitions, that hurt the entrepreneur's private benefits rather than ventures in which the entrepreneur is in control (Fried and Ganor 2006). In an acquisition exit, the entrepreneur is, in effect, ousted as the CEO of the firm. Entrepreneurs most often find this permanent removal from their firms to be an emotionally upsetting event. Some entrepreneurs even describe it as equivalent to the breakdown of a marriage (Petty, Martin, and Kensinger 1999), which explains why many entrepreneurs are reluctant to agree to an acquisition exit. VCs with stronger control rights are better able to force the entrepreneur to agree to an acquisition. Therefore, in my second hypothesis I predict a positive association between VC control rights and the likelihood of acquisition. This hypothesis is the central prediction that is tested in this article.

There are offsetting advantages to assigning rights to the VC that result from the entrepreneur's informational advantage over the VC in the day-to-day operations of the enterprise. Whenever a manager assigns rights to agents who are within an organization but who are not in a position to have the best information, the manager incurs an efficiency cost. Allocating control rights trades off between the benefit of enhanced credibility in the market that the firm gains by assigning the rights to the VC, and the benefit to the VC of using the entrepreneur's superior information, by assigning rights to the entrepreneur. An exit conflict makes it harder for the VC to break even, thus necessitating the transfer of control to the VC, even though it is inefficient.

Weak VC control rights might be associated with a greater probability of either an IPO or a write-off exit. If a successful entrepreneurial firm is ready for an exit during a robust IPO market, then a conflict of interest in exit choice between a VC and the entrepreneur is unlikely. An IPO is most likely to result, regardless of VC control rights. However, for problematic ventures in which VCs have weak control rights and cannot bring about needed managerial

decisions or changes in the entrepreneurial firm (for example, replacing the founding entrepreneur as CEO, or making control decisions regarding asset purchases and sales), there is a greater probability that the lack of VC control will lead to less VC assistance, which will produce a higher likelihood of a write-off. This latter prediction is consistent with the empirical work of Cumming and Walz (2004); Hege, Palomino, and Schwienbacher (2003); Kaplan and Strömberg (2004); Kaplan, Martel, and Strömberg (2007); and Nikoskelainen and Wright (2007).

A related prediction is that if a VC uses strong control rights (e.g., in a world in which some investors make mistakes in contracting), doing so will improve the entrepreneurial firm's governance and increase the likelihood of better performance. Better performance could lead to a higher likelihood of a successful exit, whether by IPO or acquisition, and a lower likelihood of a complete write-off.

One of the most important empirical challenges in studying contract choices in conjunction with exit outcomes is accounting for endogeneity. My new data set has information on whether the VC contracts are designed with a primary view toward an IPO or acquisition prior to signing the first-round investment. I test for robustness to the inclusion or exclusion of these preplanned exits, and to situations in which the VC has a clear exit strategy, in terms of an IPO or acquisition, at the time of first investment. I also use other robustness checks, such as the use of instrumental variables.

Nevertheless, other factors might explain the relation between control rights and exit outcomes. More highly skilled and experienced entrepreneurs might be able to negotiate control rights away from the VC, and could be more likely to go public. In that case, there is no direct causal link from contracts to exits. Instead, entrepreneurial quality independently drives contracts and exits. I control for entrepreneurial quality at the time of VC investment by using a variable that measures the investor's ranking of the entrepreneur's experience and ability.

1.2 Other factors relevant to the choice between IPOs and acquisitions

Prior theoretical work identifies a number of factors that could affect IPOs versus acquisitions²—for instance, VC characteristics. VCs can take on two roles in exit outcomes: they can add value through active assistance provided to the entrepreneurial firm³ and they can certify the quality of the entrepreneurial firm, so that information asymmetries between them and the new owners are

² A detailed survey is provided by Cumming and MacIntosh (2003b). See also Zingales (1995); Yosha (1995); Black and Gilson (1998); Gompers and Lerner (1999); Cumming and MacIntosh (2003a); Das, Jagannathan, and Sarin (2003); Hege, Palomino, and Schwienbacher (2003); Boot, Gopalan, and Thakor (2006); and Schwienbacher (2003, forthcoming).

³ See Sahlman (1990); Amit, Brander, and Zott (1998); Gompers and Lerner (1999); Hellmann and Puri (2000, 2002); Kannianen and Keuschnigg (2003, 2004); Keuschnigg (2004); Ueda (2004); Hsu (2004); and Hochberg, Ljungqvist, and Lu (2007); Casmatta and Haritchabalet (2007); Nielsen (2008); and Cumming, Schmidt and Walz (forthcoming).

lower than they otherwise would have been at the time of exit.⁴ Both of these roles are consistent with the view that higher quality and more reputable VCs facilitate IPO exits more often. My empirical tests use proxies for VC quality and value added. My tests also control for captive VCs, which I define as funds that are part of a larger corporation or bank. Captive VCs might have nonfinancial strategic motives for wanting an acquisition rather than an IPO (Gompers and Lerner 1999; Hellmann 2002; Riyanto and Schwienbacher 2006).

Several entrepreneurial firm characteristics, such as the size of a firm's assets which for IPOs must meet minimum listing requirements and the primary industry in which it operates, can also affect the choice of an IPO rather than an acquisition. In addition, because IPOs and acquisitions generate different proceeds in the sale of the firm, an entrepreneurial firm's growth potential and capital needs could be relevant for the choice between an IPO and an acquisition. Firms in industries with high market/book ratios have greater growth options and thus could be more likely to go public (Gompers and Lerner 1999).

Market conditions and regulations also play an important role in VC exit outcomes. IPO markets are subject to massive swings (Ritter 1984). I control for the returns in the public market by using the country-specific Morgan Stanley Capital International (MSCI) data for various periods in the year prior to exit. I also use investment-exit-year dummy variables; country differences, which I examine through the use of a variable for legality (La Porta et al. 1998; Berkowitz, Pistor, and Richard 2003); stock market capitalization; and country dummy variables. I expect countries with larger stock markets to have more IPOs than acquisitions (Black and Gilson 1998). Legal certainty and investor protection also are more valuable in the context of an IPO, because information asymmetry is more pronounced for a disparate group of new shareholders in an IPO than for new owners in an acquisition. Thus, the cost of going public (e.g., in terms of underpricing) is lower among countries with more legal certainty and protection (Shleifer and Wolfenzon 2002; Cumming, Fleming, and Schwienbacher 2006).

2. Variables in the Econometric Specifications

Table 1 displays the primary variables used in my empirical analyses. There are five main categories of variables: VC control rights, investor characteristics, investee characteristics, market conditions, and legal and institutional factors.

The security of choice in the United States is typically convertible preferred equity (Gompers 1998; Kaplan and Strömberg 2003), but outside the United States, many countries use a wide range of securities (Lerner and Schoar 2005; Kaplan, Martel, and Strömberg 2007; Cumming 2005). In addition to voting and board rights, commonly allocated rights in VC contracts that are particularly

⁴ See Barry et al. (1990); Megginson and Weiss (1991); Lerner (1994); Lin and Smith (1997); Gompers and Lerner (1999, 2003); Brav and Gompers (1997, 2003); Baker and Gompers (2003); Li and Masulis (2004); Neus and Walz (2005); and Chemmanur and Chen (2006).

Table 1
Variable definitions

Variable	Definition
<i>Investor fund characteristics</i>	
Noncaptive fund	A dummy variable equal to 1 if the fund is not a captive fund (a limited partnership). I define a captive fund as one that is affiliated with a bank or corporation. Separate variables to distinguish corporate VCs and bank-affiliated VCs are also used as robustness checks
Investor capital (all Funds)	The real (thousands of €2003) total amount of capital for all affiliated funds that are part of the investor's organization
Fund capital	The real (thousands of €2003) total amount of capital for the specific fund within the investor's organization that provided data for this study
<i>Entrepreneurial firm characteristics</i>	
Early/expansion	A dummy variable equal to 1 if the entrepreneurial firm was an early- or expansion-stage transaction at the time of investment of the respondent VC fund, and 0 if the firm was a late- or buyout-stage firm. I do not use more specific categories because the unit of observation is the entrepreneurial firm, not the transaction round where more than one round is provided by the investor, and because firms may progress from one stage to the next. There are also differences in definitions of investment stages across countries. Alternative variables that separate out the early- (69 companies), expansion- (82 companies), late- (32 companies), and buyout-stage (40 companies) are used as robustness checks
Foreign firm	A dummy variable equal to 1 when the entrepreneurial firm is in a different country from the investor at the time of first VC investment
Experience rank	This is a subjective ranking provided by the respondent investor about the entrepreneur's quality, ability, and experience, and intended for the date of investment. The investor provided the ranking during the initial data collection in 2002 and follow-up interviews, not at the time of actual investment. Therefore, it is a proxy, since the investors were asked to rank the entrepreneur's ability going back to the time of initial investment. The ranking is on a scale of 1–10. An alternative variable equal to 1 for ranks greater than 7 is used as a robustness check
Industry market/book	The industry market/book ratio for the industry in which the entrepreneurial firm operates at the time of exit. I suppress the dummy variables for specific industries (e.g., Medical/Biotech, Computers/Electronic, Internet/Communications, and nontech industries) for reasons of collinearity
<i>Transaction characteristics</i>	
Common equity	A dummy variable equal to 1 for common equity investments. I exclude dummy variables for other securities (convertible preferred equity, or mixes of debt or preferred and common equity) for reasons of collinearity. Special control rights, veto rights, contingencies, board seats, etc., associated with the investment are considered separately
Right to replace CEO	A dummy variable equal to 1 if the investor(s) has the right to replace the CEO. This right is typically not a contractual right per se, but effectively a right in the hands of the investor by virtue of the voting power provided via the investor's shares in the firm and/or board seats. This is not my interpretation of the contracts. The investors themselves provided me with the information on whether or not the investor had such power
Majority board seats	A dummy variable equal to 1 if the VC investor(s) have a majority of the board seats at the investee firm
Majority voting	A dummy variable equal to 1 if the VC investor(s) have a majority of the voting rights at the investee firm
Drag along	A dummy variable equal to 1 if the VC investor(s) have a drag-along right that obligates the entrepreneur to sell shares along with the offer that the VC initiates
Redemption	A dummy variable equal to 1 if the VC investor(s) have a redemption right that enables the VC to sell their shares back to the entrepreneur at prespecified terms
Antidilution	A dummy variable equal to 1 if the VC investor(s) have an antidilution right that entitles the investors to additional shares to maintain their ownership percentage

(Continued overleaf)

Table 1
(Continued)

Variable	Definition
Control rights index	Sum of the following investor(s) control right dummy variables (dummy takes the value of 1 if investor has the right): drag along, redemption and antidilution. (I do not include other control rights in the index, as they do not directly relate to acquisition exits; however, these rights are available on request.)
Veto rights index	Sum of the following investor(s) veto right dummy variables (dummy takes the value of 1 if investor has the right): asset sales, asset purchases, changes in control, issuance of equity, any other decisions
Syndication	The number of syndicated investors
Prior rounds	A dummy variable equal to 1 if there was a prior VC before the respondent VC had invested in the entrepreneur. (The precise number of prior rounds is not known for all the exited investments in the data, but in all cases it is known whether or not the other VC(s) used the same securities.)
Lead investor	A dummy variable equal to 1 if the respondent investor was the lead investor in the syndicate
Private investment value	The real (thousands of €2003) value of the respondent investors' initial investments in the entrepreneurial firm
Total investor ownership %	Ownership % for all of the investor(s) in the best-case scenario for the value of the entrepreneurial firm
<i>Exit variables</i>	
IPO	A dummy variable equal to 1 if the VC exits the investment by means of an IPO
Acquisition	A dummy variable equal to 1 if the VC exits the investment by means of an acquisition (trade sale). The IRRs of the investment were considered to avoid misclassification of write-offs as acquisitions
Buyback	A dummy variable equal to 1 if the VC exits the investment by means of a buyback whereby the entrepreneur repurchases the investors' interest
Write-off	A dummy variable equal to 1 if the investor exits the investment by a write-off
No Exit	A dummy variable equal to 1 if the investor does not exit the investment by the time of final data collection (December 2005)
IRR	The internal rate of return for the investor that provided the data. Calculated by the investor, and based on all of the actual cash flows
<i>Market conditions and institutional variables</i>	
Legality index	Weighted average of following factors based on Berkowitz, Pistor, and Richard (2003) and La Porta et al. (1998): efficiency of judicial system, rule of law, corruption, risk of expropriation, and risk of contract repudiation. Higher numbers indicate "better" legal systems. The legality index is for the country in which the entrepreneur is based
Creditor rights	An index aggregating different creditor rights from La Porta et al. (1998). Higher numbers indicate more creditor-friendly legal systems
Antidirector rights	An index aggregating the shareholder rights labeled as "antidirector rights" (shareholder rights) as defined in La Porta et al. (1998). Higher numbers indicate more shareholder-friendly (and minority shareholder-friendly) legal systems
MSCI returns 1 year prior to exit	The country-specific monthly MSCI index in the 0–12 months prior to first exit (i.e., IPO date, or date of acquisition or write-off)
MSCI returns 3–6 months prior to exit	The country-specific monthly MSCI index in the 3–6 months prior to first exit (i.e., IPO date, or date of acquisition or write-off)
MSCI returns 0–3 months prior to exit	The country-specific monthly MSCI index in the 0–3 months prior to first exit (i.e., IPO date, or date of acquisition or write-off)
Market capitalization	The real (billions of €2003) market capitalization of the domestic stock market of the country in which the investee resided in the year of exit
Country dummy variable	Dummy variables for specific countries of the investee
Year dummy variables	Dummy variables for the initial investment year (of the respondent investor) and exit years (same for all investors). The summary statistics (Table 3) also present a variable for the number of investment months of the respondent investor

This table defines each of the variables. The data are from 223 VC fund investments in Austria, Belgium, Czech Republic, Denmark, France, Germany, Italy, The Netherlands, Poland, Portugal, and Switzerland over the period 1995–2002, and exits over the period 1996–2005. To ensure that I do not double-count observations, I use the entrepreneurial firm, not the investment round, as the unit of observation, and base contract terms on the initial investment of the respondent VC investor.

important in the IPO-versus-acquisition decision (Kaplan and Strömberg 2003; Hellmann 2006) include a drag-along right, in which the VC has the right to force the entrepreneur to sell at the same terms to a third party; a redemption right, which gives the VC the right to sell interest in the firm back to the entrepreneur at prespecified terms and after a specific point in time, which is typically three years after the initial investment; and an antidilution right that protects the VC against future financings at lower than the protected valuation. Other rights include a right of first refusal in a sale, i.e., the VC must be offered sale terms that are at least as good as, and in advance of, those offered to a third party; a co-sale right, which allows the VC to sell to a third party on the same terms as the third party offers the entrepreneur; and a protection right against new issues. There are also veto rights over asset sales, asset purchases, changes in control, issuances of equity, and many other decisions. In some cases, the VCs have the right to replace the founding entrepreneur as CEO. I do not expect all of the various control rights to have an equal effect on exit outcomes.

Perhaps closest to the notion of entrepreneurial control in incomplete contracting theories is the right to replace the CEO. That is, as a residual control right, it gives the investors the right to take this particular action. Investors can also force an acquisition through other residual control rights, such as if they control a majority of the board, a majority of the votes, or whether there are other terms in the contract that give the VCs the power to force an exit, for example, by using a redemption right or a drag-along clause. A redemption right can be used to force an acquisition if it is difficult or undesirable for the entrepreneur to repurchase the VC's interest. An antidilution right gives VCs more bargaining power in subsequent financing rounds, and if the firm needs further financing, this right is likely to lead to a larger dilution of entrepreneurial control. A right to veto asset sales, purchases, and new equity issues could be used as a threat in negotiations, and might indirectly affect the exit outcome, although it is less clear that such a right could be used to force an acquisition or buyback.

Other rights play a smaller role in the IPO-versus-acquisition decision. The automatic conversion provision usually only applies in an IPO (Hellmann 2006) and is a precommitment to give up control rights when the firm is offered a sufficiently valuable exit (as in Black and Gilson 1998). An IPO registration right can be viewed as the right of investors to force an IPO. Similarly, a piggy-back right applies only in an IPO. A co-sale right, a right of first refusal, and a veto against change in control all give investors protection if the entrepreneur tries to sell the firm in part or whole to a new owner (Chemla, Habib, and Ljungqvist 2007 analyze some of these provisions). Information rights typically call for the firm to supply timely financial statements and related materials. These rights have no direct bearing on the exit decision. So, in the remainder of the article, I use the term "strong VC control rights" to refer to contractual control rights that are relevant to IPOs versus acquisitions, including the drag-along, redemption, and antidilution rights, as well as the right to replace the CEO, majority votes, and majority boards.

Written contracts include many of these contractual terms; however, I note that the right to replace the CEO is almost never an explicit contractual clause between the investor and the entrepreneur. In Italy, for example, Cumming and Zambelli (2007) document that an explicit clause to replace the CEO would be illegal in the period considered by my data set. Rather, the right to replace the CEO comes from the voting power (and, in some cases, special voting rights) of the investor with respect to board seats and ownership interest in the firm. For some investments, this right to replace the CEO becomes effective only in the event of nonperformance by the entrepreneur. (Performance hurdles are set up as conditions for the initial investment.) However, in my empirical analyses with limited degrees of freedom, controls for different standards are not tractable. Therefore, my variable for the right to replace the CEO is a dummy variable equal to 1 if the investor informed me that there was some mechanism in the contract by which the investor(s) could bring about such a change.

I note that across financing rounds, the European investors did not indicate significant alterations to their contract structures, such as a change in the use of one security or another across rounds, or the inclusion/exclusion of terms such as veto rights and the right to replace the founding entrepreneur as CEO. Over the course of interviews with the fund managers who provided the data, I learned that, generally, an extreme event would be needed to warrant alteration of specific terms across rounds. The investors indicated that such extreme changes would lead to a breakdown in the relationship between the investor and entrepreneur, and would be unduly costly to renegotiate.

Founder ownership and control do, however, tend to get diluted in each financing round, particularly when more syndicated investors are added in a new round. In such cases, the basis for coding is the first-round investment data, because there are differing numbers of rounds prior to exit and a number of nonexits in the data, so that the final round ownership and control data are not directly comparable; also, by the last investment round, ownership and control rights are likely to be more endogenous to exit outcomes than are those at the initial investment round. Regardless, I find that the primary results are robust to the use of different periods of measurement for terms that vary across rounds. Obviously, there are also contingencies in certain contractual terms, such as contingencies pertaining to ownership percentages. I use the ownership percentages in the event of successful outcomes, not write-offs. In a few cases, the common stock has limited redemption rights (jointly with liquidation rights) attached to them, and other veto and control rights. I do not find that attributes of the common stock variables make a material difference to the exit results, other than what is recorded separately in the other variables. Table 1 lists the veto rights, control rights, etc.

Other variables for transaction characteristics include a dummy for whether there are VCs invested in the entrepreneurial firm prior to the respondent investor. This dummy controls for differences across VCs that originate the

deal. To control for size effects I also include a variable for the book value of the initial investment of the respondent VC. Due to data limitations, I do not control for other VC investment amounts, because I could not determine all amounts of other investors. Nor do I include the amount invested in all financing rounds, since that amount would be endogenous (Gompers 1995).

Table 1 also shows the variables for investor characteristics. I consider dummy variables equal to 1 for noncaptive VCs. Captives often behave differently than noncaptives, because they have strategic reasons for investing in firms that are developing technologies relevant to the larger organization. Hence, they might be more likely to exit by acquisition when the acquirer is the affiliated company of the captive (Gompers and Lerner 1999; Hellmann 2002; Cumming 2005; Riyanto and Schwienbacher 2006). Noncaptives often have pay incentives that attract superior VC talent (Gompers and Lerner 1999), which could lead to an association between noncaptives and IPOs. VCs with more capital might also have superior talent, which could result in an association with IPOs. I also consider dummy variables for different funds.

Table 1 also defines various investee characteristics that I use in my specifications. I use dummy variables for different stages of development at the time of first investment, because later stage investments could be connected to different exit outcomes, regardless of contract terms and other factors. I use the ranking of the entrepreneur by the VC as a variable to control for entrepreneurial quality. The rank is on a scale of one (lowest) to ten (highest). I note that this ranking was made in 2002 when, although there had been many IPOs by this time, many investments had not yet exited. Hence, there is some degree of look-back bias that cannot be avoided for the pre-2002 exits. But this look-back bias overcompensates for this factor in the direction of IPOs, and hence this control variable is quite appropriate. I also control for industry market/book values at the time of exit because higher market/book industries are more likely to be associated with IPOs (Gompers and Lerner 1999).

As in Gompers and Lerner (1999), I use MSCI returns for the three months prior to exit and for the six- to three-month period prior to exit to control for market conditions. I use the year of investment and year of exit dummy variables to control for market conditions and hot-issue markets. I use variables for country-specific market capitalization and the legality index of the country of domicile of the entrepreneur, and country dummy variables, since law quality can influence the development of VC and stock markets and the likelihood of an IPO exit (La Porta et al. 1998; Shliefer and Wolfenzon 2002; Armour and Cumming 2006; Cumming, Fleming, and Schwienbacher 2006).

3. Data

In this section I describe the data and I provide summary statistics and comparison of means and medians tests.

3.1 Sample description

The data comprise 223 entrepreneurial firms financed by 35 VC funds from 11 continental European countries: Austria, Belgium, Czech, Denmark, France, Germany, Italy, The Netherlands, Poland, Portugal, and Switzerland. The VCs financed these firms between 1995 and 2002. There are 32 IPOs, 74 acquisitions, 17 buybacks, and 64 write-offs between 1996 and 2003, comprising a total of 187 VC financings. There were thirty-six unexited investments as of December 2005, the time of this study. The unit of analysis is the entrepreneurial firm, not an investment round, or the syndicated investor (staging and/or syndication is not double-counted in the data).

To collect the data, I first sent surveys to all continental European funds that were members of the European Venture Capital Association (EVCA) between January 2002 and January 2003. I carried out follow-up interviews in person for most Dutch, Belgian, and German funds, and by phone for funds in other countries. Some of the funds did not provide details on all of their investments; rather, the manager(s) only provided data for specific investments or deals on which the manager(s) worked. I studied and analyzed actual contracts, with the assistance of the VC managers alongside a Ph.D. student in law, in 2004 and 2005. The survey and interview method revealed information not found in a written contract.

To ensure the integrity of the data collected, I promised the respondents that the information collected from the thirty-five funds would remain strictly confidential and would not be made publicly available. The data were disclosed on a completely voluntary basis. Given the type of confidential information collected, I cannot refer to an aggregate industry database for comparison. However, I can point out that in terms of the frequency of IPOs, acquisitions, and write-offs, my sample is similar to prior data sets on VC exits (Cumming and MacIntosh 2003a, 2003b; Schwienbacher 2003; Cochrane 2005).

The scope of other VC data sets (Cumming and MacIntosh 2003a, 2003b; Schwienbacher 2003; Kaplan and Strömberg 2003; Lerner and Schoar 2005) is also similar to mine in terms of detail and number of observations. Further, the frequency of the use of particular contracts is similar to that reported in this study, thus accounting for institutional differences between the United States and Europe. The most notable institutional difference between Europe and the United States is in the use of convertible securities in the United States (Sahlman 1990; Bergmann and Hege 1998; Gompers 1998; Schwienbacher 2003; Kaplan and Strömberg 2003). Among all countries where VC contract data have been collected, the United States is the only country in the world in which convertible preferred equity is used most frequently (Cumming 2005). Tax considerations are one explanation for the dominant use of convertible securities for VC-backed firms in the United States (Gilson and Schizer 2003). I do not exclude investments in the sample based on the security used. For instance, I report the use of straight preferred investments, because this security is also occasionally used by Canadian and U.S. VCs that invest in Canada (Cumming 2005), and

by VCs in developing countries (Lerner and Schoar 2005). Regardless, in my data, the results are robust to the inclusion/exclusion of this subsample.

3.2 Summary statistics

Table 2 shows the total number of investments each year, with breakdowns by the type of security used in each year of first investment. The time variations in the contracts are consistent with other international data sets (see, e.g., Kaplan, Martel, and Strömberg 2007). The data indicate that the greatest number of investments occurred in 2000. This finding is consistent with the aggregate EVCA data (<http://www.evca.com>). The EVCA does not record details of contracts.

One important aspect of the data is that syndicated investors almost invariably used the same securities as the investors who provided these data. I observe differences in only six of 223 cases. These are the cases in which the syndicated investor used common equity or warrants while the respondent investor used a security involving debt and/or preferred equity.

Due to considerations of confidentiality, I do not provide details for each of the thirty-five funds. I can best describe the funds as “generalist” funds that have a broad focus on entrepreneurs at different stages of development, from very early to very late. The lack of specialization of VCs in Europe is a function of the depth of the market, particularly in continental Europe. (I note that the U.S. market has funds with a much greater degree of specialization; see Gompers and Lerner 1999, 2001a,b.) Some funds in my sample are part of a larger corporation or bank (captive funds); some are noncaptive VCs (limited partnerships). I examine country (and fund) effects in my multivariate tests and focus on the countries that involve a majority of the exits. No single fund provides more than twenty investments, and no single fund or country accounts for a majority of the exits.

Table 3 provides summary statistics across columns 1–12 and differences tests across columns 13–18. The table summarizes the data for all observations, as well as for the subsample of IPOs, acquisitions, and write-off exits. The subsamples of buybacks and nonexits are not summarized in Table 3 for reasons of conciseness. Because Table 3 does not summarize the data for any particular fund, greater details are possible without compromising the confidentiality of any single fund. The funds from the Eastern European countries are small; funds from elsewhere in Europe are large. I control for fund size in the multivariate empirical analyses.

The results of comparison tests in Table 3 (columns 13–18) provide a number of insights into the role of VCs in IPOs compared to acquisitions. The most important results appear in column 13 (for comparison of medians tests) and column 16 (comparison of means and proportions tests). The data indicate that IPOs are more likely than acquisitions for common equity investments when the mean and median public market returns have been greater in the months prior

Table 2
Summary of the data by year

Year of investment	Sample size		Exit type by year of investment				Security by year of investment				Control rights by year of investment			
	Number of investments by year of investment	Number of exits by year of investment	IPOs	Acquisitions	Buybacks	Write-offs	Not exited	Common	Convertible preferred	Mixed debt/preferred/common	Straight debt or straight preferred	Right to replace CEO	Majority board seats	Average control + veto rights index
Panel A: Summary of the data by year of investment ¹														
Numbers														
1995	6	6	1	4	0	1	0	3	1	2	0	5	4	7.5
1996	8	8	6	1	0	1	0	6	0	2	0	5	5	6.3
1997	17	17	7	5	0	5	0	9	2	6	0	12	10	6.6
1998	22	21	5	12	0	4	1	12	3	7	0	8	10	5.6
1999	34	30	5	11	5	9	4	13	11	10	0	12	14	4.7
2000	74	55	4	18	7	26	19	31	34	7	2	23	30	4.6
2001	51	39	3	19	4	13	12	23	17	6	5	16	14	5.0
2002	11	11	1	4	1	5	0	3	4	3	1	9	7	5.4
Whole Sample	223	187	32	74	17	64	36	100	72	43	8	90	94	5.1
Percentages														
1995–1998	53	52	35.85%	41.51%	0.00%	20.75%	1.89%	56.60%	11.32%	32.08%	0.00%	56.60%	54.72%	78.02%
1999–2000	108	85	8.33%	26.85%	11.11%	32.41%	21.30%	40.74%	41.67%	15.74%	1.85%	32.41%	40.74%	57.89%
2001–2002	62	50	5.60%	29.60%	8.80%	31.20%	24.80%	43.20%	40.80%	10.40%	5.60%	31.20%	35.20%	63.39%
Whole sample	223	187	14.35%	33.18%	7.62%	28.70%	16.14%	44.84%	32.29%	19.28%	3.59%	40.36%	42.15%	64.20%

Table 3
Summary statistics and difference tests

	Full sample of all exits and nonexits			IPO exits		
	(1) Proportion or median	(2) Minimum	(3) Maximum	(4) Proportion or median	(5) Minimum	(6) Maximum
Total number of observations (number of entrepreneurial firms)	223					
Proportion of noncapcive investors	0.65	0.00	1.00	32	0.00	1.00
Proportion of capcive investors	0.35	0.00	1.00	0.78	0.00	1.00
Median total capital managed by investor ('000) (this fund only)	€160,000.00	€9400	€760,000	0.22	€27,250	€760,000
Median total capital managed by investor ('000) (all affiliated funds)	€190,000.00	€9400	€4,000,000	€150,000	€27,250	€4,000,000
Median IRR	15.00%	-100.00%	900.00%	64.00%	30.00%	900.00%
Median private investment value ('000)	€3607.00	€50.00	€108,000	€4,449	€500	€108,000
Proportion of all types of high tech firms	0.54	0.00	1.00	0.53	0.00	1.00
Proportion of biotech/medical firms	0.12	0.00	1.00	0.16	0.00	1.00
Proportion of computer/electronics firms	0.20	0.00	1.00	0.19	0.00	1.00
Proportion of communications/internet firms	0.22	0.00	1.00	0.19	0.00	1.00
Median industry market/book	5.61	4.05	6.77	5.61	4.05	6.77
Median investor rank of entrepreneur	6.00	1.00	10.00	7.00	3.00	10.00
Proportion of early/expansion stage firms	0.68	0.00	1.00	0.63	0.00	1.00
Proportion of common equity investments	0.45	0.00	1.00	0.75	0.00	1.00
Proportion of convertible securities	0.32	0.00	1.00	0.16	0.00	1.00
Proportion of debt or preferred and common securities	0.19	0.00	1.00	0.09	0.00	1.00
Proportion of prior round(s) of other investors	0.11	0.00	1.00	0.19	0.00	1.00
Median number of syndicated investors	1.00	0.00	5.00	1.00	0.00	3.00
Median ownership % of all investors	51.00%	20.00%	96.00%	55.50%	4.16%	92.00%
Proportion of investments with majority VC voting	0.54	0.00	1.00	0.59	0.00	1.00
Median all investor board seats/total board seats	0.40	0.00	1.00	0.40	0.00	0.80
Proportion of investments with right to replace CEO	0.40	0.00	1.00	0.34	0.00	1.00
Proportion of investments with drag-along rights	0.23	0.00	1.00	0.13	0.00	1.00
Proportion of investments with redemption rights	0.37	0.00	1.00	0.31	0.00	1.00
Proportion of investments with antidilution rights	0.57	0.00	1.00	0.41	0.00	1.00
Median total number of types of veto rights	5.00	0.00	5.00	4.50	0.00	5.00
Median number of investment months of respondent investor	46	6	96	40	12	75
Median MSCI return 1 year prior to exit	0.07	-0.56	1.88	0.24	-0.56	1.88
Median MSCI return 0-3 months prior to exit	0.01	-0.43	0.77	0.06	-0.16	0.77
Median legality index	20.76	15.00	21.91	20.84	15.00	21.91
Median market capitalization (billions)	€695,210	€11,002	€1,475,457	€695,210	€31,279	€1,475,457

	Acquisitions			Write-offs		
	(7)	(8)	(9)	(10)	(11)	(12)
	Proportion or median	Minimum	Maximum	Proportion or median	Minimum	Maximum
Total number of observations (number of entrepreneurial firms)	74			64		
Proportion of noncaptive investors	0.64	0.00	1.00	0.56	0.00	1.00
Proportion of captive investors	0.36	0.00	1.00	0.44	0.00	1.00
Median total capital managed by investor ('000) (this fund only)	€210,000.00	€9400	€760,000	€150,000	€27,250	€760,000
Median total capital managed by investor ('000) (all affiliated funds)	€500,000.00	€9400	€4,000,000	€160,000	€15,000	€4,000,000
Median IRR	25.90%	8%	900%	-100%	-100%	-10.29%
Median private investment value ('000)	€4000	€150	€108,000	€3500	€50,000	€33,625
Proportion of all types of high tech firms	0.47	0.00	1.00	0.61	0.00	1.00
Proportion of biotech/medical firms	0.12	0.00	1.00	0.13	0.00	1.00
Proportion of computer/electronics firms	0.19	0.00	1.00	0.19	0.00	1.00
Proportion of communications/internet firms	0.16	0.00	1.00	0.30	0.00	1.00
Median industry market/book	4.05	4.05	6.77	5.61	4.05	6.77
Median investor rank of entrepreneur	6.00	2.00	10.00	6.00	1.00	10.00
Proportion of early and expansion stage firms	0.55	0.00	1.00	0.77	0.00	1.00
Proportion of common equity investments	0.27	0.00	1.00	0.47	0.00	1.00
Proportion of convertible securities	0.42	0.00	1.00	0.25	0.00	1.00
Proportion of debt or preferred and common securities	0.24	0.00	1.00	0.25	0.00	1.00
Proportion of prior round(s) of other investors	0.15	0.00	1.00	0.06	0.00	1.00
Median number of syndicated investors	1.00	0.00	3.00	1.00	0.00	4.00
Median ownership % of all investors	55.00%	2.00%	92.00%	44.85%	9.00%	99.60%
Proportion of investments with majority VC voting	0.59	0.00	1.00	0.44	0.00	1.00
Median all investor board seats/total board seats	0.50	0.00	0.80	0.40	0.00	1.00
Proportion of investments with right to replace CEO	0.65	0.00	1.00	0.30	0.00	1.00
Proportion of investments with drag-along rights	0.42	0.00	1.00	0.22	0.00	1.00
Proportion of investments with redemption rights	0.54	0.00	1.00	0.30	0.00	1.00
Proportion of investments with antidilution rights	0.69	0.00	1.00	0.52	0.00	1.00
Median total number of types of veto rights	5.00	0.00	5.00	5.00	0.00	5.00
Median number of investment months of respondent investor	40	12	60	43	6	96
Median MSCI return in 1 year prior to exit	0.07	-0.56	1.88	0.07	-0.33	0.56
Median MSCI return in 0-3 months prior to exit	0.00	-0.43	0.77	0.01	-0.24	0.16
Median legality index	20.60	15.00	21.91	20.76	15.00	21.91
Median market capitalization (billions)	€695,210	€11,002	€1,475,457	€695,210	€11,002	€1,432,190

(Continued overleaf)

Table 3
(Continued)

	Median tests		Mean tests and comparison of proportions tests			
	(13) Test of IPOs (4) vs. acquisitions (7)	(14) Test of IPOs (4) vs. write-offs (10)	(15) Test of acquisitions (7) vs. write-offs (10)	(16) Test of IPOs (4) vs. acquisitions (7)	(17) Test of IPOs (4) vs. write-offs (10)	(18) Test of acquisitions (7) vs. write-offs (10)
Total number of observations (number of entrepreneurial firms)				-3.79***	-3.10	0.85
Proportion of noncapactive investors				1.48	2.10**	0.87
Proportion of captive investors				-1.48	-2.10**	-0.87
Total capital managed by investor ('000) (this fund only)	$P \leq 0.395$	$P \leq 0.717$	$P \leq 0.091^*$	-1.07	0.00	1.75*
Total capital managed by investor ('000) (all affiliated funds)	$P \leq 0.151$	$P \leq 0.719$	$P \leq 0.061^*$	-0.98	-0.03	1.93*
IRR	$P \leq 0.000^{***}$	$P \leq 0.000^{***}$	$P \leq 0.000^{***}$	1.01	4.62***	11.82***
Private investment value ('000)	$P \leq 0.528$	$P \leq 0.282$	$P \leq 0.610$	0.10	0.21	-0.12
Proportion of all types of high tech firms				0.55	-0.73	-1.60
Proportion of biotech/medical firms				0.48	0.42	-0.06
Proportion of computer/electronics firms				-0.02	0.00	0.03
Proportion of communications/internet firms				0.32	-1.15	-1.89*
Industry market/book	$P \leq 0.664$	$P \leq 0.334$	$P \leq 0.154$	5.66***	0.00	-6.99***
Investor rank of entrepreneur	$P \leq 0.103$	$P \leq 0.349$	$P \leq 0.748$	3.04***	2.85***	-1.17
Proportion of early and expansion stage firms				0.68	-1.44	-2.60***
Proportion of common equity investments				4.60***	2.62***	-2.42**
Proportion of convertible securities				-2.62***	-1.05	2.09**
Proportion of debt or preferred and common securities				-1.77*	-1.81*	-0.09
Proportion of prior round(s) of other investors				0.50	1.89*	1.62
Number of syndicated investors				0.00	0.00	1.03
Ownership % of all investors	$P \leq 0.062^*$	$P \leq 0.309$	$P \leq 0.375$	0.00	0.02	1.23
Proportion of investments with majority VC voting	$P \leq 0.015^{**}$	$P \leq 0.282$	$P \leq 0.126$	-0.01	1.44	1.84*
All investor board seats/total board seats				-2.17**	0.00	0.67
Proportion of investments with right to replace CEO	$P \leq 0.528$	$P \leq 0.719$	$P \leq 0.860$	-2.90***	0.47	4.12***
Proportion of investments with drag-along rights				-2.91***	-1.06	2.50**
Proportion of investments with redemption rights				-2.18**	0.10	2.84***
Proportion of investments with antidilution rights				-2.71***	-1.02	2.04**
Total number of types of veto rights	$P \leq 0.008^{***}$	$P \leq 0.720$	$P \leq 0.003^{***}$	-1.16	-1.04	3.41***
Number of investment months of respondent investor	$P \leq 0.426$	$P \leq 0.829$	$P \leq 0.849$	0.00	-0.80	-0.79
MSCI return 1 year prior to exit	$P \leq 0.006^{***}$	$P \leq 0.003^{***}$	$P \leq 0.856$	0.62	0.60	0.11
MSCI return 0-3 months prior to exit	$P \leq 0.004^{***}$	$P \leq 0.456$	$P \leq 0.845$	1.37	1.14	-2.56***
Legality index	$P \leq 0.375$	$P \leq 0.615$	$P \leq 0.860$	0.56	0.18	0.47
Market capitalization (billions)	$P \leq 0.008^{***}$	$P \leq 0.017^{**}$	$P \leq 0.839$	0.00	0.00	-0.28

This table presents a summary of the data by the total sample (columns 1-3), IPOs (columns 4-6), acquisitions (columns 7-9), and write-offs (columns 10-12). Median values are presented; means are not presented for reasons of conciseness. Proportions represent the fraction of the number of observations on the top row for each column. The table does not show minimum and maximum values for proportions, because the minimum is always 0 and the maximum is always 1. Investment years span 1995-2002. Exit years span 1996-2005. Variables are as defined in Table 1. The table shows comparison tests for differences in medians, means, and proportions of various characteristics of the investors and entrepreneurs for the different exit outcomes. The mean test is the standard test for two samples and based on the t -distribution, under the assumption that population distributions are normal. The median test is the two-sample equivalent of the one-sample sign test, and does not have any distributional assumptions and/or any assumptions about the population variance. See <http://www.fon.hum.uva.nl/Service/Statistics.html> for a summary of these different test statistics. *, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

to exit (consistent with Gompers and Lerner 1999), and among countries with greater stock market capitalization (consistent with Black and Gilson 1998).

A higher ranking of the entrepreneur by the VC (on a scale of 1–10) is associated with a greater probability of an IPO (column 16), and median IRRs are higher for IPOs than acquisitions (column 13). There are other differences, depending on industry and stage of first investment. The table shows that more high-tech firms (with high market/book ratios) and early stage firms are more likely to go public (column 16) and more likely to be written off (column 18).

The summary statistics in Table 3 support the central hypothesis in this article by indicating that acquisitions are more likely when the investor has greater control rights. Investments in which the investor has the right to replace the CEO are more often associated with acquisitions than with IPOs. Write-offs also are less common among investments in which the investor has the right to replace the founding entrepreneur as CEO. Acquisitions are more likely for investments with convertible debt and convertible preferred equity, with mixes of debt or preferred equity with common equity, and for investments with a greater proportion of investor veto rights and control rights.

In Table 4, panels A and B show two correlation matrices. Panel A presents correlations across exit outcomes, and investor, entrepreneur, transaction, market, and institutional variables. Panel B presents correlations across exit outcomes and transaction characteristics, and the country dummy variables. Significant correlations at the 5% level appear in boldface and are consistent with the comparison tests in Table 3.

One implication of Table 4 panel A is that common equity is a proxy for weak VC control rights. The table shows that investors are less likely to use veto and control rights when the VC uses common equity. This finding is consistent with related theoretical work on the topic.⁵

Table 4 panel B presents correlations across country-specific dummy variables. I find statistically significant values in certain cases. Therefore, I use country dummy variables for these countries to check the robustness in my empirical tests. However, I note that the country dummies might reflect fund-specific factors, as there are not many funds in the data for each of the specific countries. I also examine fund dummy variables, but due to collinearity and a loss of degrees of freedom, not all such dummy variables can be included simultaneously with the country dummy variables.

4. Multivariate Regressions

Here, I describe my regression model specifications, robustness checks, and extensions.

⁵ Cestone (2002) argues that common equity with strong investor veto and control rights would give the investor too great an incentive to intervene in the entrepreneurial firm. Casmatta (2003) argues that common equity is used to encourage advice, whereas convertible claims and contractual control rights tend to be used to facilitate monitoring.

Table 4
Correlation matrix

Panel A. Correlations across contracts, exits, market variables and legal variables¹

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(1) IPO	1.00																							
(2) Acquisition	-0.37	1.00																						
(3) Buyback	-0.14	-0.26	1.00																					
(4) Write-off	-0.33	-0.58	-0.23	1.00																				
(5) IRR	0.36	0.30	0.03	-0.61	1.00																			
(6) Noncaptive	0.11	-0.05	0.19	-0.15	0.11	1.00																		
(7) Investor fund capital	0.15	0.08	-0.14	-0.12	0.05	0.11	1.00																	
(8) Private investment value	0.17	-0.07	0.00	-0.06	0.07	0.13	0.12	1.00																
(9) Industry market/book	0.00	-0.10	-0.06	0.15	0.02	-0.16	0.04	-0.21	1.00															
(10) Entrepreneur experience	0.13	-0.12	-0.03	0.04	0.08	-0.04	-0.07	0.01	-0.13	1.00														
(11) Early/expansion stage	-0.03	-0.17	0.04	0.17	-0.07	-0.33	-0.16	-0.36	0.48	0.03	1.00													
(12) Common equity	0.32	-0.22	-0.19	0.09	0.15	-0.03	0.09	0.04	0.04	0.28	0.08	1.00												
(13) Convertible security	-0.18	0.13	0.24	-0.14	-0.04	-0.03	-0.26	-0.06	0.07	-0.13	0.22	-0.60	1.00											
(14) Prior round(s)	0.10	0.08	-0.06	-0.12	0.24	0.01	0.05	0.12	0.20	0.08	0.09	0.07	0.05	1.00										
(15) Number of syndicated investors	0.00	0.11	-0.12	-0.04	0.03	-0.17	0.00	0.03	0.17	-0.05	0.13	0.02	0.04	0.29	1.00									
(16) Replace CEO	-0.10	0.32	-0.06	-0.22	-0.01	0.19	0.47	0.11	-0.24	-0.22	-0.40	-0.22	-0.04	-0.03	0.03	1.00								
(17) Majority board	-0.03	0.10	-0.11	-0.02	0.02	0.05	0.23	0.18	0.05	0.04	-0.11	0.08	0.03	0.13	0.19	0.13	1.00							
(18) Majority voting	0.06	0.11	-0.04	-0.13	0.04	0.17	0.23	0.18	-0.21	-0.15	-0.40	-0.07	-0.02	-0.09	0.22	0.42	0.26	1.00						
(19) Drag along	-0.15	0.27	-0.11	-0.09	0.04	0.03	0.11	0.00	0.05	-0.27	-0.08	-0.12	0.12	-0.04	-0.07	0.20	0.39	0.19	1.00					
(20) Redemption	-0.07	0.25	-0.10	-0.14	0.03	0.06	0.55	0.06	-0.05	-0.14	-0.22	-0.13	-0.18	-0.09	0.06	0.60	0.06	0.23	0.05	1.00				
(21) antidilution	-0.16	0.18	0.04	-0.09	0.05	0.03	0.39	-0.02	0.08	-0.17	-0.15	-0.20	0.00	-0.16	0.09	0.45	0.08	0.32	0.09	0.68	1.00			
(22) Veto rights	-0.07	0.28	-0.14	-0.14	-0.02	-0.18	0.35	0.07	-0.18	-0.14	-0.26	-0.28	0.06	-0.17	-0.04	0.52	0.19	0.21	0.25	0.40	0.35	1.00		
(23) MSCI 0-3 months	0.39	-0.28	0.01	-0.02	0.04	-0.07	0.17	0.09	0.06	0.03	0.09	0.22	0.02	-0.01	0.07	-0.10	0.17	0.19	0.04	-0.08	-0.06	-0.04	1.00	
(24) Legality	-0.07	0.11	-0.16	0.04	-0.10	-0.23	0.47	0.06	-0.07	-0.10	-0.14	-0.08	-0.20	-0.01	-0.02	0.37	-0.01	0.11	0.01	0.33	0.38	0.23	0.03	1.00
(25) Market capitalization	-0.13	0.06	-0.07	0.09	-0.06	-0.01	0.08	0.01	0.27	-0.18	0.01	-0.07	0.05	0.18	0.06	0.05	0.08	0.05	0.14	-0.10	0.08	0.03	-0.02	0.31

Table 4
(Continued)Panel B: Correlations across country dummy variables and contracts and exits²

	Austria	Belgium	Czech	Denmark	France	Germany	Italy	Netherlands	Poland	Portugal	Switzerland
IPO	0.00	0.03	-0.06	0.06	0.00	-0.19	0.23	-0.16	0.00	0.03	0.23
Acquisition	-0.02	-0.08	-0.02	0.01	0.04	-0.02	-0.09	0.18	-0.08	-0.04	-0.04
Buyback	-0.06	0.19	-0.04	-0.06	0.15	-0.02	-0.12	-0.08	0.30	-0.05	-0.09
Write-off	0.06	-0.06	0.09	-0.02	-0.13	0.18	-0.02	-0.01	-0.10	0.05	-0.09
IRR	-0.06	0.02	0.11	-0.01	0.04	-0.11	0.15	-0.06	-0.01	0.00	0.05
Common equity	0.16	-0.08	0.15	-0.05	-0.09	-0.08	0.24	-0.16	-0.22	0.18	0.20
Convertible security	-0.07	0.10	-0.09	0.15	0.19	0.21	-0.16	-0.23	0.36	-0.11	-0.21
Prior Round(s)	-0.07	0.00	-0.05	0.02	0.31	0.03	0.12	-0.17	-0.10	-0.05	0.08
Number of syndicated investors	0.04	0.11	-0.04	0.12	0.16	0.03	0.13	-0.22	-0.16	0.08	0.01
Right to replace CEO	-0.10	-0.10	-0.12	0.05	0.20	-0.21	-0.23	0.26	-0.24	0.09	0.33
Majority board	-0.11	-0.11	0.14	0.04	0.20	-0.06	0.09	-0.13	-0.07	-0.06	0.24
Majority voting	-0.13	0.01	0.04	0.02	0.11	-0.12	0.14	0.00	-0.28	0.14	0.16
Drag along	-0.11	-0.08	0.02	-0.12	-0.04	0.15	-0.04	-0.03	0.04	-0.01	0.08
Redemption	-0.15	-0.03	-0.10	0.07	-0.15	-0.20	-0.19	0.26	-0.21	0.18	0.37
Antidilution	-0.15	0.14	-0.15	0.05	-0.15	0.04	-0.16	0.11	-0.31	0.13	0.25
Veto rights	-0.02	-0.30	-0.25	-0.05	0.09	-0.17	-0.20	0.34	0.04	0.02	0.20
Summary of number of exits from each country											
Number of IPOs	1	2	0	2	1	2	7	7	2	1	7
Number of acquisitions	2	2	1	3	3	14	6	34	3	1	5
Number of buybacks	0	3	0	0	2	3	0	4	5	0	0
Number of write-offs	3	2	2	2	0	19	7	22	2	2	3
Number of unexited investments as at 2005	4	1	2	4	0	13	1	7	0	2	0

¹This table presents correlation coefficients across various contractual variables, exit outcomes, market variables, and legal variables. Because the following variables are contingent on exit and the exit year, the sample comprises only the exit sample of 187 exited companies for the following variables: IPO, acquisition, write-off, IRR, MSCI prior year, and market capitalization. For all other variables, the sample represents the full sample of all 223 exited and unexited investments. The variables are as defined in Table 1. Correlations highlighted in boldface are statistically significant at the 5% level.

²This table presents correlation coefficients across country dummy variables and various contractual variables and the exit outcomes. Because the following variables are contingent on exit and the exit year, the sample comprises only the exit sample of 187 exited companies. The number of exits from each country is summarized at the bottom of this table. The variables are defined in Table 1. Correlations highlighted in boldface are statistically significant at the 5% level of significance.

4.1 Base regression models

Table 5 reports two multinomial logit regression models of the impact of VC fund, entrepreneurial firm, transaction details, and market and institutional conditions on exit outcomes. I present the marginal effects from the multinomial logit estimates to illustrate explicitly economic significance as well as statistical significance. The marginal effects indicate the probability of each exit outcome that is associated with the particular right-hand-side variable. The explanatory variables are as defined in Table 1. I do not use year-of-exit dummy variables because buybacks and nonexits are both possible outcomes (besides IPOs, acquisitions, and write-offs). There were buybacks only in 2004 and 2005, and nonexits are as of 2005, thus, the year-of-exit dummies would give rise to problems of perfect collinearity. Model II is presented alongside model I to show different explanatory variables.

The strongest finding in Table 5 is the relation between transaction characteristics and exit outcomes. There is a positive association between acquisitions, strong VC control rights, and the right to replace the founding entrepreneur as CEO. There is a negative association between IPOs and VC control rights. Further, the data indicate a negative association between write-offs and VC control rights.

Model I indicates that the right to replace the CEO is associated with a 38.6% greater probability of an acquisition. The economic significance is lower, at 23.6%, in model II when I add correlated variables—including majority boards, majority votes, veto rights, and the sum of drag-along, redemption, and antidilution rights—on the right-hand side. Majority boards are associated with a 23.7% increase in the probability of an acquisition in model I and an 18.4% increase in model II. Model II shows that each additional control right (drag-along, redemption, and antidilution rights) results in an additional 12.2% increase in the probability of an acquisition exit. The evidence on majority boards, right to replace the CEO, and VC control rights is consistent with the notion that entrepreneurs derive a nonpecuniary benefit associated with being the CEO of a publicly listed firm, and that investor control is valuable in effecting acquisitions when entrepreneurs would otherwise prefer an IPO for nonpecuniary reasons.

In Table 5, the most important variable for IPO exits is that of market conditions. Public market returns in the three months prior to exit are closely related to IPOs. In terms of economic significance, the regression models indicate that an increase in public market returns from 1% to 4% increases the probability of an IPO by approximately 1%. The role of public market returns in the three-month period prior to the IPO very strongly supports the evidence for the U.S. market presented by Gompers and Lerner (1999). The variable for the three- to six-month MSCI return is not significant, nor is a variable for the MSCI return in the year prior to the IPO date. I do not use this variable in the regressions, but the results are available on request. Finally, in Table 5 note that captive VCs are approximately 22% more

Table 5
Multinomial logit regressions

	Model I: Basic specification				Model II: Alternate basic specification			
	IPO	Acquisition	Buyback	Write-off	IPO	Acquisition	Buyback	Write-off
Constant	-0.613	3.173*	-0.013	-1.260	-1.056	3.259*	0.226	-0.984
Investor characteristics								
Log (fund capital)	-0.011	-0.036	-0.047**	-0.001	0.030	-0.108	-0.050*	0.037
Nonactive VC fund	-0.004	-0.221*	0.103**	0.048	0.058	-0.214*	0.084*	0.012
Investee characteristics								
Early or expansion stage	-0.026	-0.097	0.003	0.121	-0.005	-0.120	-0.001	0.094
Entrepreneur experience rank	0.007	-0.034	-0.004	0.015	0.011	-0.029	-0.003	0.006
Log (industry market/book)	0.058	-0.235	-0.051	0.167	0.096	-0.295	-0.062	0.178
Transaction characteristics								
Log (private investment value)	0.019	-0.043	0.005	0.039	0.014	-0.031	0.004	0.023
Prior rounds	0.029	0.282**	-0.019	-0.301**	0.030	0.395**	-0.019	-0.413**
Replace CEO	-0.068	0.386***	0.024	-0.159	-0.068	0.236*	0.036	-0.028
Majority board	-0.106**	0.237***	-0.039	0.035	-0.092*	0.184*	-0.043	0.082
Majority vote					0.040	-0.059	0.006	-0.085
Control rights index					-0.066**	0.122**	0.014	-0.072
Veto rights					0.011	0.056	-0.008	-0.052
Market characteristics								
Log (MSCI 3-6 months)	0.122	-0.056	0.123	-1.199	0.058	0.251	0.123	-1.323
Log (MSCI 0-3 months)	1.007***	-1.668***	0.290	0.366	0.916***	-1.682**	0.254	0.603
Investment year dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Institutional and legal variables								
Log (legality)	-0.026	-0.833	0.110	0.203	0.046	-0.787	0.060	0.116
Log (market capitalization)	0.052*	0.063	0.014	0.003	0.022	0.093	0.013	0.005
Country dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model diagnostics								
Number of observations			223				223	
Chi-squared			191.197***				215.221***	
Log likelihood			-237.457				-225.445	
Pseudo R^2			0.287				0.323	

This table presents multinomial logit estimates of the impact of investor characteristics, investee characteristics, transaction characteristics, market conditions, and institutional and legal factors on the various VC exit outcomes: IPOs, acquisitions, buybacks, and write-offs. Models I and II examine all 223 exits and nonexits. The variables are as defined in Table 1. I use investment-year dummy variables for 2000 and 2001, and country dummy variables for The Netherlands and Germany. I do not use additional year and country dummy variables due to perfect collinearity problems. I use the MSCI returns prior to exit for 2005 for the no-exit observations. The table presents values for the marginal effects, not the standard multinomial logit coefficients, in order to explicitly highlight economic significance alongside statistical significance. The marginal effects are not presented for the no-exit outcomes for reasons of conciseness. Standard errors are clustered by VC fund (see, e.g., Petersen forthcoming). White's (1980) HCCME is used in all models. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

likely to exit by acquisition than noncaptive VCs, as expected (see subsection 1.2).

4.2 Endogeneity

Table 6 presents regression models on the determinants of exit outcomes that are similar to those in Table 5, but with one major exception. In Table 6, I examine the effect of endogeneity of control rights on exits. I use two-step instrumental variable estimates. Step 1 of models III and IV accounts for the factors that affect the extent of VC control. Step 1 of model III considers binomial logit estimates for majority board seats and the right to replace the CEO. Step 1 of model IV considers ordered logit estimates of the control rights index for the sum of dummy variables for drag-along, redemption, and antidilution rights. Step 2 of models III and IV estimates the multinomial logit model of exit outcomes.

In Table 6, I use the exogenous variables that are included in step 1 and excluded in step 2 of models III and IV. These variables are the La Porta et al. (1998) indexes for creditor rights and antidirector (shareholder) rights. These instruments are intuitively related to contract terms, as confirmed by all of the correlations that are reported in Table 7. I do not expect to find a relation between creditor rights and exit outcomes, unless the efficiency of bankruptcy law is related to write-offs. Table 7 indicates that creditor rights are not statistically related to any of the exit outcomes, which confirms the suitability of that instrument for the data. Antidirector rights may be positively related to the probability of an IPO (La Porta et al. 1998), but the data here indicate the opposite. The correlation between antidirector rights and IPO exits is -0.18 . This negative correlation can only be explained by independent factors driving the IPO exits, and by little or no direct relation between IPOs and antidirector rights. In contrast, the antidirector rights index is significant and negatively related to the contract terms. This finding is consistent with the view that as shareholders, VCs use contracts as substitutes for the absence of strong legal protection (Lerner and Schoar 2005). Creditor rights are positively and significantly related to contract terms, which is intuitive, because when decisions have to be made in times of financial distress, VCs as shareholders want priority over and above creditors. Also, I use the industry market/book value at the time of first investment as an instrumental variable. This is a valid instrument because the second-step regressions use the industry market/book value at the time of exit. The results of the second-step regressions are similar when I use the different instruments and different specifications for the first-step regressions, and are available on request.

In Table 6, the step 1 evidence in models III and IV indicates that creditor rights are statistically and positively related to the extent of VC control and to the right to replace the CEO, but not statistically related to majority board seats. A one-point increase in the creditor rights index (on the scale of 0–4) increases the probability of the VC acquiring the right to replace the CEO by

Table 6
Instrumental variable multinomial logit regressions

	Step 1: determinants of choice variables				Step 2: determinants of exit outcomes				Step 1: determinants of choice variables				Step 2 model b: determinants of exit outcomes			
	Binary logit: replace CEO		Binary logit: majority board		IPO	Acquisition	Write-off	Ordered logit: control index	IPO	Acquisition	Write-off	IPO	Acquisition	Write-off		
Constant	0.412	0.005	-0.530	2.096	-0.581	1.777***	-0.258	1.882	-0.444							
Investor characteristics																
Log (fund capital)			-0.027	0.036	-0.029		-0.033	0.012	0.004							
Noncaptive VC fund			0.005	-0.201*	0.010		-0.009	-0.233**	0.048							
Investee characteristics																
Early or expansion stage	-0.324***	-0.187**	0.014	-0.219*	0.173	-0.453**	0.045	-0.128	0.040							
Entrepreneur experience rank	-0.063**	0.012	0.016	-0.060**	0.019	-0.158***	0.029*	-0.002	-0.035							
Log (industry market/book) (time of investment for step 1 and time of exit for step 2)	-0.016	0.230**	0.121	-0.426*	0.181	0.417*	0.018	-0.385	0.327							
Transaction characteristics																
Log (private investment value)			0.015	-0.044	0.050		0.016	-0.042	0.049							
Prior rounds			0.014	0.285**	-0.259*		0.019	0.301**	-0.278**							
Replace CEO (fitted value from step 1)			0.051	-0.176	0.041											
Majority board (fitted value from step 1)			-0.073	0.223*	0.039											
Control index (fitted value from step 1)							0.041	0.145**	-0.155***							
Market characteristics																
Log (MSCI 3–6 months)			0.158	-0.176	-1.382*		0.157	0.166	-1.628**							
Log (MSCI 0–3 months)			0.974***	-1.757***	0.377		0.961***	-1.660***	0.357							
Investment year dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Institutional and legal variables																
Antidirector rights	-0.058	-0.126**				-0.096										
Creditor rights	0.316***	0.055				0.192*										
Log (Legality)			-0.067	-0.413	-0.093		-0.140	-0.510	-0.120							
Log (market capitalization)			0.050*	0.051	0.024		0.053**	0.063	0.020							
Country dummies?	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes							

(Continued overleaf)

Table 6
(Continued)

	Model III: instrumental variables			Model IV: alternate instrumental variables		
	Step 1: determinants of choice variables		Step 2: determinants of exit outcomes	Step 1: determinants of choice variables	Step 2 model b: determinants of exit outcomes	
	Binary logit: replace CEO	Binary logit: majority board	IPO	Acquisition	Write-off	Ordered logit: control index
Ordered logit parameters						
Mu (1)						0.679***
Mu (2)						1.951***
Model diagnostics						
Number of observations	223	223		223		223
Chi-squared	85.450***	26.371***		154.568***		155.232
Log likelihood	-107.675	-138.629		-255.771		-255.439
Pseudo R ²	0.284	0.087		0.232		0.233

This table presents instrumental multinomial logit estimates of the impact of investor characteristics, investee characteristics, transaction characteristics, market conditions, and institutional and legal factors on the various VC exit outcomes IPOs, acquisitions, buybacks, and write-offs. Models III and IV examine all 223 exits and nonexits. The variables are as defined in Table 1. I use investment-year dummy variables for 2000 and 2001, and country dummy variables for The Netherlands and Germany. I do not use additional year and country dummy variables due to perfect collinearity problems, i.e., where there is no variation for any one of the exit outcomes associated with a year and/or a country. I use the MSCI returns prior to exit for 2005 for the no-exit observations. In model III, step 1, I first regress the binary dependent variables for the right to replace the CEO and majority board seats on investee characteristics, investment dummies, and the legal indexes for antidirector and creditor rights. Panel B presents the correlations between endogenous variables, instruments, and exit outcomes. Step 2 of model III then uses the fitted values of the step 1 regressions for the right to replace the CEO and majority board seats variables. Model IV is identical to model III, except that step 1 of model III uses an ordered logit estimate of the number of control rights for the sum of drag-along, redemption, and antidilution rights and then the fitted values of that estimated variable for step 2. For step 1 in model III and step 2 in models III and IV, to explicitly highlight economic significance alongside statistical significance, the values are the marginal effects, not the standard multinomial logit coefficients. Step 1 in model IV presents values of the standard ordered logit coefficients, not the marginal effects for each ranked outcome, for reasons of conciseness. Step 2 in models III and IV does not show the marginal effects for the buyback and no-exit outcomes for reasons of conciseness. Standard errors are clustered by VC fund. White's (1980) HCCME is used in all models. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7
Correlations between instruments, endogenous variables, and exit outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Creditor rights	1.00							
(2) Antidirector rights	-0.42	1.00						
(3) Log (industry market/book) at 1st investment	-0.30	0.13	1.00					
(4) IPO exit	0.00	-0.18	0.00	1.00				
(5) Acquisition exit	0.14	0.02	-0.10	-0.37	1.00			
(6) Write-off exit	-0.07	0.23	0.13	-0.33	-0.58	1.00		
(7) Right to replace CEO	0.43	-0.28	-0.21	-0.05	0.35	-0.14	1.00	
(8) Majority board seats	0.16	-0.23	0.04	0.01	0.15	0.04	0.13	1.00
(9) Control rights index	0.19	-0.15	0.04	-0.13	0.33	-0.09	0.54	0.25

This table presents correlations between the instruments (creditor rights, antidirector rights, and industry market/book at first investment), the endogenous variables (right to replace CEO, majority board seats, and the control rights index), and the second-step exit outcome variables (IPOs, acquisitions, and write-offs). Correlations are for the full sample for the contract terms, and for the subsample of 187 exits for the exit variables. Correlations that are statistically significant at the 5% level are highlighted in boldface.

31.6%. I note that although the creditor and antidirector rights are negatively correlated (-0.42 for this sample), the statistical and economic significance of the regressions is not materially affected by the inclusion or exclusion of these variables. For instance, excluding antidirector rights in step 1 of model III in Table 6 increases the economic significance of creditor rights from 31.6% to 34.3% for the right to replace the CEO without changing the statistical significance.

A one-point increase in the creditor rights index also increases the probability of an extra control right (drag-along, redemption, or antidilution) by on average approximately 3%. The economic significance of a one-point increase in creditor rights is 4.9% to move from two to three, and 2.6% to move from three to four in step 1 of model IV.

In contrast, antidirector rights are more closely tied to majority board seats. An increase of one point in the index (on the scale of 0–6) reduces the probability of VC majority board seats by 12.6%. The step 1 regressions in Table 6 further indicate that VCs are more likely to have a majority on the board and to have greater control rights for those firms in industries with higher market/book ratios (high-tech industries). VCs are less likely to take majority board seats, have the right to replace the CEO, and have other control rights for earlier-stage investments. VCs are also less likely to have the right to replace the CEO and other control rights when the entrepreneur has a higher experience ranking.

The step 2 regressions in models III and IV in Table 6 are consistent with those reported for models I and II in Table 5. Majority board seats lead to a 22.3% increase in the probability of an acquisition exit (model III), and each additional control right increases the probability of an acquisition by 14.5% (model IV). The one result that differs from models I and II is that the right to replace the CEO is statistically insignificant in model III.

In general, the alternative specifications for the step 1 and 2 regressions in Table 6 invariably support at least one of the VC control right variables as being

significantly related to acquisition exits. The instrumental variables regressions are not completely robust to alternative specifications, but nevertheless indicate support for the central proposition in the paper that VC control influences the IPO-versus-acquisition choice, even after controlling for endogeneity.

4.3 Additional robustness checks

In this subsection I describe the results from six additional robustness checks (models V–X) that are presented in Table 8. I also discuss a number of additional robustness checks that were carried out but not explicitly reported.

So that I can include dummy variables for exit years, models V–X exclude buyback and non exits from the sample. Model V presents a standard specification without buybacks and nonexits that is comparable to model I without such exclusions. The regression results are similar and continue to support my central hypothesis.

Model VI provides a similar regression, but excludes investment years 1995–1998, because I want to check if contracts are related to exits in a way that is driven by the time period spanned by the data. For instance, if VCs in Europe were less sophisticated in the mid-1990s, and thus wrote less detailed contracts, and since market conditions enabled different exit opportunities in the Internet bubble period, then contracts might be connected to exits for reasons unrelated to the hypotheses discussed in subsection 1.1. However, the estimates in model VI indicate that the data do not support this alternative explanation of the results. The relation between VC control rights and acquisitions continues to hold for the subsample that excludes investment years 1995–1998. The results also hold for other subsamples that exclude other periods that are not explicitly presented here. These results are available on request.

Regression models V–VIII in Table 8 indicate a negative relation between the right to replace the CEO and write-offs. That is, detailed VC contracts tend to enable the VC to prevent “bad” outcomes. In model VII, for example, the right to replace the founding entrepreneur reduces the probability of a write-off by 31.7%, and the control rights (drag-along, redemption, and antidilution) reduce the probability of a write-off by 18.2%. Although the correlation between the right to replace the CEO and the control rights index is 0.54 (Table 7), excluding either variable from model VII in separate regressions (not reported but available on request) does not materially affect the significance and magnitude of the positive effect of VC control on acquisitions and the negative effect of VC control on write-offs. The finding that stronger VC control reduces the probability of a write-off is consistent with Lerner (1995) and Gompers and Lerner (1999). It is also consistent with the Kaplan, Martel, and Strömberg (2007) result that international VC funds that do use contracts with strong VC control rights are more likely to survive the Internet bubble crash after 2000.

My results suggest that strong VC rights are more likely to protect a VC’s interest and force an acquisition. Weak control rights are more often associated

Table 8
Robustness checks

	Model V: excluding buybacks and nonexits			Model VI: excluding investment years 1995–1998			Model VII: excluding preplanned exits		
	IPO	Acquisition	Write-off	IPO	Acquisition	Write-off	IPO	Acquisition	Write-off
Constant	-0.389	2.959	-2.570	0.084	2.191	-2.275	0.015	10.561***	-10.576***
Investor characteristics									
Log (fund capital)	-0.044	-0.151	0.195*	-0.002	-0.173	0.175	-0.006	-0.092	0.099
Noncaptive VC fund	-0.005	-0.299*	0.305*	0.011	-0.161	0.150	0.013	-0.205	0.192
Investee characteristics									
Early or expansion stage	0.041	-0.225	0.185	-0.030	-0.239	0.269	0.033	-0.102	0.069
Entrepreneur experience rank	0.017	-0.033	0.016	0.004	-0.007	0.002	0.004	0.019	-0.023
Log (industry market/book)	0.122	-0.441	0.319	0.061	-0.332	0.271	-0.051	-0.137	0.187
Transaction characteristics									
Log (private investment value)	0.018	-0.085	0.067	0.004	-0.044	0.040	0.022	-0.162**	0.141
Prior rounds	-0.001	0.405**	-0.404**	-0.011	0.610***	-0.599**	0.009	0.481*	-0.490*
Replace CEO	-0.019	0.374**	-0.355**	-0.021	0.334*	-0.313*	-0.003	0.321*	-0.317*
Majority board	-0.089	0.217*	-0.128	-0.022	0.128	-0.106	-0.056	0.163	-0.107
Control rights index	-0.048	0.121*	-0.073	-0.007	0.184**	-0.177**	0.002	0.181**	-0.182**
Market characteristics									
Log (MSCI 3–6 months)	-0.171	-1.698	1.868	0.455	-0.035	-0.421	0.715	-7.980***	7.265
Log (MSCI 0–3 months)	0.561	-2.818***	2.257**	0.167	-1.371	1.204	0.282	-5.345***	5.063**
Exit year dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investment year dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Institutional and legal variables									
Log (legality)	-0.063	-0.947	1.011	0.013	-0.142	0.129	0.082	-4.369***	4.287***
Log (market capitalization)	0.061	0.311	-0.372*	-0.023	0.063	-0.040	-0.023	0.329**	-0.306
Country dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model diagnostics									
Number of observations		170			118			117	
Chi-squared		145.158***			69.347***			127.876***	
Log likelihood		-104.934			-79.033			-60.181	
Pseudo R ²		0.409			0.305			0.515	

(Continued overleaf)

Table 8
(Continued)

	Model VIII: early and expansion stage			Model IX: early stage			Model X: subsample of funds that provided all investments		
	IPO	Acquisition	Write-off	IPO	Acquisition	Write-off	IPO	Acquisition	Write-off
Constant	0.105	0.668	-0.773	0.041	-1.235	1.193	-1.148	5.233	-4.086
Investor characteristics									
Log (fund capital)	0.062	-0.198*	0.136	-0.002	-0.263	0.265	-0.021	-0.050	0.071
Nonactive VC fund							0.090	-0.395**	0.305*
Investee characteristics									
Early or expansion stage							-0.001	-0.206	0.206
Entrepreneur experience rank	0.018	-0.024	0.005	0.002	-0.042	0.040	0.017	-0.052	0.035
Log (industry market/book)	-0.034	-0.150	0.184	-0.003	-0.723	0.726	0.150	-0.624*	0.474
Transaction characteristics									
Log (private investment value)	0.009	0.060	-0.069	0.006	0.245	-0.251	-0.003	-0.042	0.045
Prior rounds							-0.025	0.519***	-0.494**
Replace CEO	0.018	0.270	-0.288*	0.002	0.449	-0.451	-0.013	0.109	-0.096
Majority board	-0.111*	0.293**	-0.181	-0.009	0.457	-0.448	-0.057	0.069	-0.012
Control rights index	-0.100**	0.223***	-0.123	-0.006	0.405**	-0.399**	-0.056*	0.172**	-0.116
Market characteristics									
Log (MSCI 3-6 months)	1.017**	-1.539**	0.523	0.066	-1.506	1.440	0.098	0.063	-0.161
Log (MSCI 0-3 months)	Yes	Yes	Yes	Yes	Yes	Yes	0.902**	-1.830**	0.928
Exit year dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Institutional and legal variables									
Log (legality)	-0.230	0.099	0.131	-0.017	-0.097	0.113	0.238	-1.113	0.875
Log (market capitalization)	-0.016	0.061	-0.045	-0.001	0.244	-0.243	0.029	0.045	-0.075
Country dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model diagnostics									
Number of observations		110			49			127	
Chi-squared		66.861***			42.305***			82.122***	
Log likelihood		-80.752			-26.765			-90.160	
Pseudo R ²		0.293			0.441			0.313	

This table presents additional robustness checks on the multinomial logit estimates of the impact of investor characteristics, investee characteristics, transaction characteristics, market conditions, and institutional and legal factors on the VC exit outcomes IPOs, acquisitions, buybacks, and write-offs. To use dummy variables for exit years (2000-2005), investment years (1997-2002), and countries (Germany, Italy, The Netherlands, and Switzerland), models V-X present estimates excluding buybacks and non exits. Model VI excludes the subsample of investments in 1995-1998. Model VII excludes the subsample of preplanned exits. Models VIII and IX examine the subsample of investments at the seed-money and expansion stages, and only the seed stage, respectively. Model X examines the subsample of funds that provided all of their investments as at 2002. To explicitly highlight economic significance alongside statistical significance, the values are the marginal effects, not the standard multinomial logit coefficients. Standard errors are clustered by VC fund. White's (1980) HCCME is used in all models. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

with IPOs, but are also associated with write-offs and a noncovered investment. For instance, there were fifteen pure common equity investments in the data with absolutely no control rights above and beyond those held by the entrepreneur. Among those, six were IPOs, six were write-offs, and three were not yet exited in 2005. I also note that the trend in the European data is more often toward using convertible securities, both in the data introduced in this article (Table 2) and in the Kaplan, Martel, and Strömberg (2007) data. These trends also are consistent with the use of greater downside protection after the crash of the Internet bubble on 14 April 2000, which caused a major downturn in the market.

To control for the possibility of endogeneity of contracts vis-à-vis exits, model VII excludes the preplanned exits in the data. In the full sample of 223 investments, 70 of the investments (31.4%) indicate a degree of preplanned exit behavior at the time of investment (and do not necessarily indicate such plans to the investee); 55 of the 70 (79%) are exited investments in our sample as of 2005. This evidence on preplanning behavior suggests the possibility of endogeneity vis-à-vis contracts and exits, although the VCs indicate that the preplanned exit outcome was by no means certain at the time of investment. Among the preplanned exits, the investors indicate that their (preplanned) strategy turned out to have the desired result only 53% of the time (Cumming and Johan 2007c). Regression model VII in Table 8 indicates that the results are robust to excluding preplanned exits. This finding is strongly consistent with alternative controls for endogeneity in Table 6.

In models VIII and IX, I examine the subsample of only seed investments, i.e., start-ups at the time of first VC investment, and seed and expansion investments, respectively. These are important to show that the results are not driven by investments that were close to exiting at the time of first investment.⁶ Model X examines only the funds that provided all of their investments as of 2002, which means that I had to reject the observations of fifteen funds. This robustness check is important to show that the results are not affected by VCs withholding information on some of their investments, such as the poorer performing ones.

All of the estimates consistently support the central propositions that relate contracts to exits. In other models (not reported but available on request), I consider dummy variables for funds, rather than countries. The results show that fund effects are not driving the results. However, I note that I could not use dummy variables for twelve funds because of collinearity problems. Further, in other models, which are available on request, I consider different definitions of certain variables to show that the results are not driven by the model specifications. These models use dummy variables for seed, expansion, and late stages. At the time of the first VC investment, there are 69 seed investments, 82 expansion investments, 32 late investments, and 40 buyouts in the data. The

⁶ Most of the econometric specifications in Tables 5, 6, and 8 use a dummy variable for early/expansion stages. One difficulty with using more specific definitions of stages of development is that such terms are sometimes interpreted differently in different countries. However, I attempted as best as possible to mitigate such definitional problems in recording the data.

models also use a dummy variable for entrepreneurs with rankings of seven or more (as an alternative to the other models with the ranking variable on the one-to-ten scale) and a second VC dummy for both captive and noncaptive VCs. (I suppress the captive bank VC dummy for reasons of collinearity.) Because there are twenty-eight exits of foreign investments and nine unexited foreign investments, I also include a variable for the exits in which the investment is initially in a foreign firm. Also, I consider the use of different contract terms, which I include as right-hand-side variables. When I use common equity as a proxy for weak VC control rights, I find that it is associated with a 12.3% greater chance of an IPO and a 30.1% smaller chance of an acquisition. These findings are consistent with the comparison tests in Table 3. In a similar specification, I find that drag-along rights are more important in effecting an acquisition than are redemption or antidilution rights. Drag-along rights are associated with a 15.8% reduction in the probability of an IPO and a 31.5% increase in the probability of an acquisition.

I also considered other robustness checks, such as Heckman's (1976, 1979) sample selection corrections, to control for the nonrandom selection of an exit event versus an on going investment in the portfolio.⁷ The results are robust. These checks are not reported here but are available on request.

5. Conclusion

In this article I introduce a new data set that is based on 35 European VC funds and 223 entrepreneurial firms in 11 continental European countries. My sample covers the years 1995–2005. Detailed contract data indicate a wide range of cash flow and control rights. Among the 223 entrepreneurial firms, there are 187 IPO, acquisition, and write-off exits. Controlling for market conditions, legal and institutional factors, and a variety of entrepreneurial firm and VC characteristics, the data highlight a statistically and economically significant positive association between acquisitions and the use of VC veto and control rights, particularly the right to replace the founding entrepreneur as CEO. The relation between strong VC rights and acquisitions is robust to controls for endogeneity and the exclusion of preplanned exit transactions.

Although many regressions presented in this article show some differences in economic significance, the data indicate that the probability of an acquisition is approximately 30% more likely when VCs have effective contractual control rights, such as drag-along rights, board control, and the ability to replace the founding entrepreneur as CEO. The data further show that weak VC control rights are associated with a greater probability of IPO exits and a greater probability of write-off exits. The new evidence in this article supports a growing

⁷ Unexited investments tend to be poorer performing ones and VCs on average inflate valuations of unexited investments to their institutional investors (Cumming and Walz 2004; Cochrane 2005; Cumming, Fleming, and Schwienbacher 2006; Beuselinck and Manigart 2007; Cumming and Johan 2007a).

body of theoretical work on the proposition that VC control rights are correlated with and facilitate exit outcomes.

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