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Venture capital exit rights

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Venture Capital Exit Rights*

Carsten Bienz¹ and Uwe Walz²

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Abstract:

Theorists argue that exit rights can mitigate hold-up problems in venture capital. Using a hand-collected data-set of venture capital contracts from Germany we show that exit rights are included more frequently in venture capital contracts when a hold-up problem associated with the venture capitalist's exit decision is likely. Examples include drag-along and tag-along rights. Additionally, we find that almost all exit rights are allocated to the venture capitalist rather than to the entrepreneur. In addition, we show that besides the basic hold-up mechanism there are other mechanisms such as ex-ante bargaining power and the degree of pledgeable income that drive the allocation of exit rights.

JEL Classification: G24, G34, D80

Keywords: Venture Capital, Corporate Governance, Empirical Contract Theory, Hold-up, Exit Rights, Trade-sale Rights.

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1 Introduction

The question how hold-up can be overcome is central to much of the literature on incomplete contracts.¹ The problem permeates all types of incomplete contracts, including financial and venture capital contracts (Kaplan and Strömberg (2003)). More specifically, Chemla, Habib, and Ljungqvist (2007), extending the model of Nöldeke and Schmidt (1995), propose exit rights as a means to overcome hold-up in the relationship between the venture capitalist (VC) and the entrepreneur with respect to the VC's exit decision. In this paper we empirically analyze why and when exit rights are being used and to which party these rights are allocated. Our results confirm the above view: exit rights are more frequently held by the VC when he is more likely to be held-up by the entrepreneur.²

Given the VC's limited investment horizon, his exit decision is of vital importance (see Sahlmann (1990) and Gompers and Lerner (1999)). The VC is, however, not the sole owner of the portfolio firm. The firm's founders normally hold substantial equity stakes, too. This may cause problems as the VC's and the entrepreneur's preferences are often not aligned when it comes to the exit decision. First, the entrepreneur derives private benefits from being an owner-manager (Hellmann (1998)). This may lead him to oppose certain exit choices, such as a trade sale in which he typically experiences significant losses of control benefits.³ Second, both the VC's organizational structure (Sahlmann (1990)) and the temporary nature of his competitive advantage make the VC more impatient than the entrepreneur and thus create room for hold-up by the entrepreneur. Both reasons may result in ex-post renegotiation. Ex-post renegotiation and the possible losses incurred by the VC in turn may lead to ex-ante under-investment. Therefore, it is not surprising to see that the contracts between the VC and the founders often include provisions that govern this crucial exit decision. Exit rights comprise clauses related to the two most important exit channels, initial public offerings (including demand rights and piggy back rights) and trade sales (including drag-along rights, tag-along rights, and preemption rights).

In this paper we analyze the allocation of exit rights in general but stress two of the most important clauses, drag-along rights and tag-along rights. A drag-along right gives its holder the right to force all other shareholders in the firm to sell their shares to an (outside) buyer at the same price at which the right holder sells his shares. The tag-along right allows the holder to include his shares in a sale for the same price as all other shareholders. Thus these rights possess option-type characteristics.

In order to do so, we introduce a new hand-collected sample of 464 contracts between VCs and entrepreneurs from Germany. Our sample ranges from 1990 to 2004 and is randomly drawn from a large proportion of the German VC market. Our data set not only provides us with the

¹See, e.g. Grossman and Hart (1986), Hart and Moore (1988), Hart and Moore (1990), Hart (1995), and Nöldeke and Schmidt (1995).

²Note that in contrast to much on the literature on large shareholders, in the case of venture capital, both the investors and the managers are in danger of being held up. See also Burkart, Gromb, and Panunzi (1997).

³In 2005, IPOs constituted only 10% of all exits in the US VC industry, while 90% of all firms were sold via a trade-sale (Kyriakos and Ueda (2007)).

contracts between the VC and the entrepreneur but also allows us to observe characteristics of the firm, the VC, and the entrepreneur.

We use three different proxies for the presence of a hold-up problem: the firm's current investment round, the presence of exit-expectations and the use of a closed-end fund by the VC. The intuition behind the round variable is simple: on average the higher the round, the closer the exit and thus the more likely the fact that the VC wants to pursue an exit that the entrepreneur uses to enter into renegotiations in the absence of exit rights. Also, the higher the round, the more of the VC's money and expertise has been sunk in the firm. This increases the VC's lock-in and *ceteribus paribus* should increase his desire to gain protection in form of exit rights. The same is true for exit-expectations: if the VC has specific exit expectations, he is more aware of a potential hold-up problem and is more eager to include such rights in the contract. Finally, if the VC has a closed-end fund, the VC's exit problem is more pressing as opposed to an open-end fund as he has a shorter time horizon, that is he is less patient. This is both due to the limited life span of his fund and due to the fact that he may need a timely exit to prove his ability to the market.⁴

We show that the use of these exit rights is linked to our proxy variables for the presence of a hold-up problem: higher round contracts, contracts of VCs with specific exit expectations, and contracts of VCs that are organized in the form of closed-end funds all entail more exit rights. We also observe an almost exclusive allocation of exit rights towards the VC, but not towards the entrepreneur.

Our results are robust across the different exit rights as they act as complements rather than substitutes. Also, our analysis shows that besides the hold-up explanation there are other mechanisms and factors driving the allocation of exit rights. In particular, ex-ante bargaining power, as proposed by Inderst and Müller (2004), seems to affect the usage of exit rights too, as well as the amount of pledgeable income. We thereby also provide support for the idea put forward in Aghion and Bolton (1992) that control rights can partially replace pledgeable income. Additionally, we find support for the Aghion, Bolton, and Tirole (2004) hypothesis that the VC's liquidity needs may drive the inclusion of exit rights. Exit rights may allow the VC to realize the investment. If the return on this investment is high enough the VC may be able to raise a new fund.⁵ Also the fact that we can link the closed-end variable to the hold-up problem allows us to show that the VC's organizational structure may affect contracts. Controlling for these additional mechanisms in our empirical analysis leaves the basic hold-up mechanism intact. Finally we rule out institutional explanations as the driving force behind the use of exit rights.

We extend the literature in several aspects. First, we contribute to the growing literature that studies contractual incompleteness empirically.⁶ First, we show that more option-like contract

⁴Kandel, Leshchinskii, and Yuklea (2006) show that the closed-end fund structure employed by many VCs forces VCs to exit some of their investments earlier than under an open-end structure.

⁵Note that VCs are normally not allowed to reinvest funds from realized investments. Rather these funds have to be paid out to the limited partners.

⁶See Chiappori and Salanie (2003) for a survey on the growing literature on empirical contract theory. Whinton (2001) surveys empirical studies on incomplete contracts.

clauses are used when hold-up is more likely, as proposed by Chemla, Habib, and Ljungqvist (2007) and Nöldeke and Schmidt (1995). Our results are supported by two other papers that show the same mechanisms being employed in other settings. Lerner and Malmendier (2007) look at research agreements between bio-tech firms. They show that option-style contracts are more frequent when research is not directly contractible. Hotchkiss, Qian, and Song (2005) look at merger termination clauses. These clauses allow the target to walk away from the deal, but specify penalties in order to do so. As effort by the buyer is a deal specific investment, this protects his ex-ante investment.

Also, we contribute to the literature on venture capital exit rights by extending the analysis to drag-along and tag-along rights. Smith (2005) discusses and describes exit rights empirically. He focuses, however, mainly on put options and demand rights by using a sample of venture-backed IPOs, i.e. of firms which actually were divested via an IPO. Kaplan and Strömberg (2003) take a very broad look at contractual clauses between initial owners and active investors using a sample of venture capital contracts.⁷ This allows the authors to relate real world contracts to the financial contracting literature. Among other rights, they consider the use of put-options (redemption rights). We also extend other empirical studies on contract design, such as Cumming (2006), Lerner and Schoar (2005), as well as Kaplan, Martel, and Strömberg (2007) who do not consider exit rights in particular either.

We also contribute to the literature on the efficient dissolution of partnerships (see Camton, Gibbons, and Klemperer (1987) for example), by showing the absence of one of the key clauses found in partnerships, so called "shoot-out clauses". In a shoot-out clause, one partner in the partnership names a price for the firm. Then the other partners can decide whether they want to buy or sell the partnership at that particular price. The usage of these clauses seems to be widespread (see for example Brooks and Spier (2004)), even though their efficiency is disputed (see McAfee (1992)).

Finally, we are able to extend some earlier studies on hold-up that focused on relationships between firms. These include Joskow (1987) and Joskow (1988) who looks at whether coal power stations located at the mouth of a coal mine are more likely to be vertically integrated or not and Hubbard (2001) who analyzes the choice of long term versus short term contracts. Instead, we focus on parties' abilities to act opportunistically within firms.

There are two papers in the VC literature which are closely related to our analysis. Cumming (2006) is to somehow the mirror-image of our analysis. While he looks into the effect of control and exit rights on the choice of exit channels we focus on determinants of the allocation of exit rights thereby also including exit channel expectation. F

The paper proceeds in the following way. In the next section we describe our data set. In the third section we describe the most important rights used in Germany and discuss their economic implications. In the fourth section we present univariate statistics that look at the link between

⁷Also, they show that both non-compete clauses and vesting provisions are frequently used in venture capital contracts. They interpret the usage of these rights as evidence for the existence of a hold-up problem.

exit rights and possible proxies for the hold-up problem. The fifth section presents multivariate statistics that allow us to consider possible alternative explanations. Finally we discuss how the institutional and legal settings might affect our results. The last section concludes.

2 The Data Set

Our analysis uses a proprietary, hand-collected data set which was compiled on the basis of comprehensive and detailed documents made available to us by KfW (Kreditanstalt für Wiederaufbau) in Frankfurt, Germany. KfW has a unique position in Germany’s venture capital market. Being Germany’s largest promotional bank, it is in charge of large support programs that channel state funds to the private sector. However, during the time period covered in our sample (the time period between 1990 and 2004) KfW never invested directly in any of the portfolio firms but supported the firms by promoting the investment of the VC. In this position, it became indirectly involved in a significant part of all venture capital deals in Germany during the last decade. Since these programs allowed VCs to partially refinance their financial engagement in the portfolio firms via KfW, VCs had to apply for these refinancing schemes by submitting all details of the relationship between the VC and the portfolio firm to KfW, most notably, the term sheets, the business plans and the shareholder’s agreement. By giving us access to these documents (to which we got access under strict confidentiality), KfW gave us the unique chance to collect detailed information on the relationship between the VC and its portfolio firm. Also, as KfW’s policy mandate was to promote the German venture capital market, they supported a large proportion of the population of all investments realized by the German venture capital industry in the time period under consideration.⁸

In order to reduce the very time-intensive task of collecting detailed information from the shareholders agreements and the other documents to a manageable size, we selected a random sample. We categorized each portfolio company into one of three classes with respect to their investment date (before 1997, between 1998 and 2000, and 2001-2004) and eight classes with respect to the programme or programme combination through which their VC investor was supported by the KfW. This categorization was undertaken with the objective of achieving a balanced representation of the population. We then drew a proportional random sample of 300 portfolio companies.

For each investment round we evaluated the company’s balance sheet data and its business plan in order to get information with respect to the market position of the company and details about the project financed. Moreover, we gathered detailed information about the timing and conditions of the investment, and exit covenants from the term sheet and the shareholder’s agreement. We translated this information into quantifiable variables. We complemented this data set with information about the venture capitalist, that is his type (as indicated by the

⁸According to the German Venture Capital Association (see BVK (2003b) and BVK (2003a)), there were 11854 seed, start-up and expansion deals by its members in the relevant time period; KfW supported almost 7100 deals of potential members. This implies a market coverage of approximately 60%.

German Venture Capital Association), origin, or industry focus, taken from the VC's websites and Thomson VentureXpert.

As usual in this type of studies we were confronted with the problem that not all data were always available. Thus observations may vary depending on the variable studied.

2.1 Sample and Sample Selection

Table 1 gives an overview of the characteristics of the VC in the sample that constitutes the basis for our analysis. Unfortunately, the data for 10 portfolio companies could not be evaluated, therefore our random sample finally consists of 290 portfolio companies which were financed in 464 investment rounds from 1990 until 2004.

As already indicated, this sample draws from a large proportion of all investments in the German venture capital industry in the time period under consideration. As KfW's objective was to support as many applicants as possible (and given the attractiveness of the programs) there also seems to be no selection effect with respect to the entire KfW sample relative to the German market itself. Therefore, we are confident that we do not have any major selection bias in our sample in this direction. Even if there were a selection bias in the overall KfW contract sample (which we do not think to exist given the wide spectrum of VC firms involved)⁹ our analysis still depicts contract design patterns for a very large proportion (60%) of the German VC market and should therefore be valuable in itself.

In addition, since we have been responsible for the sample selection process ourselves, we have been able to make sure that no selection bias occurred via the provider of all of our documents (the KfW). One obvious selection bias which we were not able to circumvent is the fact that we are concentrating on one particular geographic region (Germany) and the associated venture capital market.¹⁰ To a lesser degree this is true for the time period. We take all this into consideration by interpreting our data sample as the description of a young and evolving venture capital market.

Table 2 provides an overview of the main characteristics of the portfolio firms as well as the financing rounds in our sample. The average amount invested per financing round is about 5.4 million euros and the portfolio companies are on average 4.77 years old when they receive VC financing for the first time. The medians are considerably smaller (1.3 million euros and 3 years) which indicates that some outliers exist. At this point, one can already infer that the percentage of start-up financing in our sample is quite high. Indeed, 66.5% of the financing rounds correspond to early stage firms.

Most of the portfolio companies of our sample (70%) are GmbHs (Limited Companies) and only 28% are AGs (Public Limited Companies). Almost all portfolio companies have their head

⁹Table 1 shows this variation clearly: we have all major types of VCs that were active in Germany included in the sample (Independent, public, and captive) and we have a substantial amount of Anglo-Saxon VCs (6.5%).

¹⁰Please see the seventh section for a discussion of how the legal and institutional background might affect our findings.

office in Germany (92%) but they are active in a broad range of industries: 5% in the field of biology or biotechnology, 12% in the medical area, 27% in the IT and software branch, 6% in the telecommunications and 10% in the internet sector, 15% in automobiles and engineering and finally 4% in chemistry. 14% of all portfolio companies could not be classified in any of these industries. Finally, 39% of all financing rounds were syndicated whereby the syndicate consists on average of 3.69 partners and staging was used in 53% of all firms. We include data from 91 VCs, an average VC financing 5 firms, while the median VC finances 2 firms in our sample.

2.2 Variable Descriptions

Table 3 describes the variables of our data set. Additionally some variables describing control rights are discussed in detail later on.

3 Functioning, legal framework and role of exit rights

3.1 Functioning of exit rights and legal framework

Often conflicts of interest regarding the exit decision can arise. First and most importantly, the entrepreneur derives private benefits from being an owner-manager (Hellmann (1998)). This may lead him to oppose certain exit choices, especially a trade sale in which he typically experiences significant losses of control benefits (?). With an IPO interests are significantly more aligned between the VC and the entrepreneur. In the course of an IPO the entrepreneur keeps or even may, due to the exit of the VC, increase her degree of control over the firm. Since the control benefits of the entrepreneur are the main source of conflicts of interest, such conflicts of interest are significantly less pronounced with an IPO compared to a trade sale where the entrepreneur is facing a high risk of being replaced. Second, both the VC's organizational structure (Sahlmann (1990)) and the temporary nature of his competitive advantage make the VC more impatient than the entrepreneur and thus may lead to conflicts of interests at the stage of the potential exit. Since VCs typically have to return the cashflows resulting from disinvestments to their investors (Gompers, P.A., Lerner, J., 1998. Venture capital distributions: short-run and long-run reactions. J. Finance 53, 2161-2183. Seite 2164 ff Oder im "The Venture Capital Cycle" Seite 266 (Chapter 13)). there is no need to exit investments due to attractive new investment possibilities. However, VCs might be forced to disinvest anyway since they are often organized as limited partnership for a pre-defined period of time (typically between 10 to 12 years). With the end-time of the fund approaching they have to sell their stakes in the firm. The alternative approach, namely to distribute shares in non-listed firms to their investors is either not very attractive (since the control premium is foregone) or not feasible at all if firms are organized as private-limited companies (which is the case in 70% of all firms in our sample).

There are three basic exit routes through which the VC can sell his shares in a well-performing venture.

First, the VC might include his shares in the sales of shares in the course of an IPO. Given that the entrepreneur does typically gain (through the exit of the VC) rather than loose control in the firm in the course of an IPO, a conflict of interest is less likely to arise in this case. Furthermore, in Germany, generally a simple majority is sufficient to opt for an IPO. In this case the firm's board is bound by this decision and has a legal obligation to register the firm with a stock exchange.¹¹ Hence, even if the entrepreneur would oppose an IPO the VC may overcome this opposition if he has the majority of voting rights.

The second exit channel for the VC is a partial sale (often to another financial investor, hence called a secondary). In a partial sale only the VC sells his part of the firm. Hence, the control position of the entrepreneur is in general not altered leading to fewer conflicts of interest. The disadvantage of this exit channel is that it is more difficult to realize the extract extra value created by a trade buyer. This extra value very often requires the complete take-over of the firm and its integration into the one of the trade buyer (cf ??).

This latter positive effect can be realized in the course of an exit of the VC via a complete sale. A trade sale, however, brings about the danger for the entrepreneur to be replaced in the course of the integration of the venture in the buyer's firm implying the complete loss of all her control benefits. Hence, the trade sale exit channel leads to a conflict of interest and potentially to strong opposition of the entrepreneur. This takes place against some particularities of German corporate law. Generally, in Germany no shareholder can force another shareholder to sell his shares. The same is true for the firm's board. So in particular, a simple majority in the shareholder's meeting is not sufficient to enforce a trade-sale against the will of shareholders. Also, there are strict rules about minority freeze-outs in Germany.¹² Also, shareholders cannot be banned from selling their shares to outsiders unless the firm's charter is amended.

****Call Option Argument****

This leaves us with the conclusion that a complete (trade) sale is more prone to conflicts of interests which can not be resolved via the firm's baseline charta as provided by German corporate law but rather require explicit exit rights. In contrast, conflicts of interest are much less important and can be addressed to a large extent by the governance provided by German corporate law.

Against this background we discuss now the functioning of different exit rights. Exit rights grant the holder the right to decide about the disposal (or acquisition) of one's own or other's shares of the firm. Thus, they can be considered as options that grant various rights in case an exit is considered (Chemla, Habib, and Ljungqvist (2007)). We can distinguish between five main exit rights that can be differentiated according to the different types of options they grant to their holder (see the left-hand part of table 4).

These first three rights are directed towards the possibility of a trade sale as an exit channel and

¹¹For an excellent discussion see Baums and Möller (2002).

¹²This applies to AGs where a shareholder needs more than 95% of all shares in order to be able to squeeze out other shareholders (§327a AktG). As there is no such clause for GmbHs, there is no way to remove minority shareholders unless there is a prior clause in the firm's charter.

are, given, our above arguments in the center of our interest. We refer to them as trade sales rights.

First, we observe **drag-along clauses**. This clause gives its holder, if he has achieved a deal with a buyer, the right to force all other shareholders to sell their shares for the same conditions to the buyer. This avoids an exit being delayed or stopped entirely by one party that is unwilling to sell. The drag-along right constitutes a call option on the shares of the other shareholders where the price agreed upon with outside parties acts as an endogenous strike price. Giving a party a drag-along right creates scope for moral hazard on the side of the owner of the right - imagine a VC that negotiates a low price for the firm but receives favors or kickbacks from the buyer later on. In this case, a drag-along should be accompanied by a pre-emption right granted to the entrepreneur.

A **pre-emption right** allows the holder of the right to force any selling shareholders to offer all the shares tendered to the owner of the pre-emption right at "fair value" rather than to an outside buyer. Fair value is often interpreted as the price the outside investor is willing to pay. Thus, the owner of the preemption right holds a call option with "fair value" denoting the strike price of the option. The pre-emption right avoids that a shareholder sells his stake in the company to an unwanted third party which may alter the balance of power in the company leading to negative effects on the old owners. If the entrepreneur possesses the pre-emption right she can prevent that the VC investor can sell his shares to an outside party. One restriction to this is that the entrepreneur needs to overcome her potential wealth constraint in order to make her pre-emption right effective. In contrast, the VC can use his pre-emption right in order to avoid that the entrepreneur sells out leaving the VC with a new unwanted party which may potentially engage in actions which reduce the value of the VC's shares (such as strategic buyers which aim to sell crucial assets to other parts of the conglomerate at too low prices).

Third, **tag-along clauses** preclude that one of the parties sells its shares to an outside investor without giving the holder of the right the chance to follow suit. It gives its holder the right to include his shares in the sale at the same price as the one offered to the initial party¹³. Thus the tag-along clause constitutes a put right with an endogenous strike price (the price offered by the buyer) A tag-along clause may avoid that one party is excluded from a value-increasing sale of the firm to a buyer who only acquires part of the shares. Value increases may be caused, for example, by synergies created or by a sale to a direct competitor and the associated increase in market power. In addition, it denies the other party the ability to sell parts of the company to an outsider which has the ability and incentive to undertake measures to reduce the value of the firm, i.e. via asset-stripping or transfer-pricing, without compensating the other shareholders.

Finally, we observe two exit rights which are especially important in the course of an initial public offering being used as the exit channel for the initial owners of the company. Given that we have argued that there are fewer conflicts of interests in the case of an IPO and given that

¹³This implies that if the buyer is only willing to buy some fraction of the firm, the shares of the holder of the tag-along right are included instead of the shares of the selling shareholder.

we observe them in fewer case, we discuss them only quite briefly.

Piggy-back rights allow each party to include their shares in an initial public offering in proportion to their stakes in the firm. Thereby, the exclusion from an IPO can be avoided. This right avoids that some shareholders can threaten to exclude other shareholders from the IPO. The holder of the right can sell his shares at the same price as all other parties whose shares are sold via the IPO. It is in this sense that piggy-back rights constitute a put option (and therefore are closely related to tag-along rights in the case of a trade sale) with the IPO price being the endogenous strike price.

Finally, **demand rights** allow the holder to force the other shareholders to agree to take the company public. Thereby, they deny other shareholders the chance to prevent or threaten to prevent a value-increasing IPO. Preventing shareholders to threaten to block a value-increasing IPO reduces their ex-post bargaining power and therefore the ability to capture a larger share of the entire payoff. Demand rights are (similar to drag-along rights for the trade sale case) call options with endogenous strike prices.

3.2 Theoretical arguments for the allocation of exit rights

In this subsection we will discuss two main theoretical approaches which address exit clauses and aim to explain their usage in VC contracts. In both approaches exit rights shift decision power towards the owner of the right at the time of the potential exit. If there are ex-post renegotiations, the bargaining power of the owner of exit right increases.

The first type of explanation views exit rights as measures to provide incentives to undertake an efficient level of specific investments in the project. The second type of explanation considers exit rights as instruments to provide proper incentives for project choice and to ensure financing of the project per se.

Chemla, Habib, and Ljungqvist (2007) belonging to the first type of explanations show that exit clauses can ensure that the contracting parties make efficient ex-ante specific investments in the firm. They build on the theory-of-the-firm literature (see e.g. Grossman and Hart (1986), Hart and Moore (1990), Hart (1995) and in particular Nöldeke and Schmidt (1995)) and apply this framework to shareholder agreements.¹⁴ They argue that exit clauses prevent the distortion of ex-ante investments by precluding hold-up of value-increasing sales of the company as well as of avoiding value-destroying ex-post transfers. The usage of these rights especially matters if, in the absence of these rights, the bargaining power of the party which contributes most to the relationship would be quite weak. The overall notion is that these exit rights are more prevalent the more pronounced the distortions of ex-ante investments are. Against the background of our above discussion we would expect that it is typically the venture capitalists who is most prone to facing a weak ex-post bargaining power with respect to the exit decision (due to the limited life-time of the VC's investment vehicle as well as due to the VC's decreasing specialization

¹⁴In particular, they extend Nöldeke and Schmidt (1995) by allowing for endogenous strike prices associated with the options.

advantage over time ; Anm. macht dies Sinn?). Therefore, we would expect that proxies for the severity of the exit problem and the relative value importance of the VC's investment possible faces (these can be firm characteristics or the VC's characteristics and the VC's investment condition) are most important with respect to the usage and allocation of exit rights. Rights allocated towards E??.....

Rather than focusing on hindering negative or fostering positive transfers in the course of the exit, Aghion, Bolton, and Tirole (2004)) focuses on the VC's potential need for liquidity. They, too, view exit rights as measures to provide proper incentives for the VC to undertake specific investments (i.e. monitoring activities of the VC)¹⁵ They analyze the choice of exit rights based on the trade off between the need for monitoring and the demand for liquidity in a mechanism design framework rather than in a model of incomplete contracting. More illiquidity increases the incentive of the active monitor (the VC) to pursue his task. This, however, comes at a cost since it imposes an illiquidity premium on the VC. Exit rights allow the VC to unwind his investment, thereby making the contract more liquid. Aghion, Bolton, and Tirole (2004) show that it is optimal to choose a more liquid contract (i.e. employ more exit rights) if the VC has a more pronounced potential demand for liquidity and if outside investors (investors in public markets or a trade buyer) receive signals of better quality at lower costs. They argue that the determinants of the intensity of liquidity demand are the VC's reputation (requiring exits less strongly) as well as hot-issue markets (??? nochmals saber checken).

The second approach views exit rights as measures to ensure financing per se and models them as substitutes for pledgable income.¹⁶ Viewing control rights as substitutes for limited pledgable cash flows focuses on the role of control rights in the interaction between cash-flow rights and private benefits (see most notably Aghion and Bolton (1992), Bolton and Scharfstein (1990), Hart and Moore (1994), and Hart and Moore (1998)).¹⁷ Control rights may resolve the potential conflicts between monetary and non-monetary benefits and interests arising from the involvement with the firm (in our particular context this involves the choice of exit timing and exit channel, i.e. different strategies which may come with the trade-off between non-monetary and monetary payoffs). The basic idea is to replenish the participation constraint of the investor in the case of lacking or unverifiable monetary returns with decision and control rights allocated to the investor. In contrast to the specific investment approach, this approach implies that the characteristics of the firm, namely the lack or presence of pledgable income, rather than the VC's characteristics matter most for the allocation of exit rights.

In our empirical analysis we aim to analyze which is of the two approaches is supported to which extent by our data.

¹⁵Bascha and Walz (2001) and Hellmann (2006) address potential conflicts of interest regarding exit choices as well. But they provide these conflicts of interests as a rationale for convertible securities rather than for the kind of exit rights discussed in our paper.

¹⁶There is an additional view on control rights in which control rights act as a signalling device (see Dessein (2005)). Due to the fact that exit issues are less of importance at the beginning of the relationship between the VC and the entrepreneur and are therefore of little relative value relevance we neglect this view in the following.

¹⁷For an early contribution on the joint allocation of control and ownership see Chan, Siegel, and Thakor (1990).

4 Descriptive Results

In this section we present our descriptive findings for the different exit clauses considered in this paper.

Allocation: A first look on the left-hand part of table 4 reveals the main elements of the exit rights prevailing in our data set. First, we should note that sale rights, in contrast to IPO rights, can be observed in a range of one to two thirds of all cases. We do not observe significant differences in the usage of drag-along, tag-along and preemption rights. The use of IPO rights seems to be, however, quite limited (below three percent of all cases).¹⁸ This is true for both piggy-back as well as demand rights.¹⁹ It is worth noting that in all cases, except with pre-emption rights, it is always the VC who holds the exit right. With pre-emption rights it is the entrepreneur who holds the right in one third of all cases.

The (almost) exclusive allocation of control rights to one party, the VC, is something that is not unusual in incomplete contracts, as predicted by Chemla, Habib, and Ljungqvist (2007) and Hart (1995). The fact that these control rights are allocated to the financier and not the entrepreneur/manager is different from some predictions on managerial incentives and monitoring (see for example Burkart, Gromb, and Panunzi (1997) or ? for entrepreneurial (non-VC) firms.).

One potential counterargument, especially with respect to firm characteristics having an influence on the allocation of exit rights is, that VCs might be using boilerplate contracts. Table 5 reveals that this is not the case. To show this, we compute how often VCs include trade-sale clauses in their contracts and then consider the distribution function over their respective portfolio firms. VC's that never or always use these clauses exist, but we also a large number of VCs including these clauses in some, but not all of their contracts. Indeed, the average VC includes drag-along rights in 40% of his contracts and tag-along rights in about 50% of his contracts. However, what seems to be clear is that the usage varies across VCs and while there may be standard contracts that are proposed by VCs not all these covenants are automatically included in the final contract.

Correlation: As a further step towards a closer examination of the different exit rights, it is helpful to take a look into the interrelationship between the different exit rights. Table 4 describes the correlations among the different exit rights. The pairwise correlations between *all exit rights* are positive and statistically different from zero at least at a ten percent confidence interval.²⁰ Hence, we can interpret these exit rights as being complements rather than substitutes. If contracts allocate one exit right to the VC it is likely that the VC also possesses other exit rights. This implies for our future analysis that we can expect that the allocation of exit rights towards the VC is by and large governed by the same factors.

¹⁸Note that Smith (2005) reports demand registration rights to be included in more than 90% of all US VC contracts.

¹⁹The fact that we observe more sale rights than IPO rights could be an indication that information acquisition matters. However, we will also discuss a potential (legal) explanation for this interesting finding in a later chapter.

²⁰The single exception being the correlation between the piggy-back right and entrepreneur preemption, which is marginally insignificant (at the 13% confidence interval).

Furthermore, this results also means a positive and statistically significant correlation between the occurrence of a drag-along right and pre-emption rights allocated towards the entrepreneur. It suggests that the potential hold-up induced by drag-along rights is tackled by incorporating pre-emption rights for the entrepreneur in the contract in turn.

In a next step we will investigate some factors that may potentially affect the usage and allocation of exit rights. We focus on four aspects which seem to play a major role for the allocation of exit rights in our data set: first, the investment round to which the observed contract relates to, second, the expectations of the VC regarding trade sales; third, the VC's organizational structure of the VC fund (being a closed-end fund or not) and finally time period in which the respective contract has been signed.

The first three variables are related to the theories discussed above. The fourth variable (Periods) depicts the evolution of exit rights along the time dimension of our sample. We interpret, the round variable in a first step (later on we discuss alternative interpretations) as a proxy for relative weight of the VC's specific investment in the firm. This is done against the background that investments increase from round to round. Furthermore, the human capital and technological knowledge of the entrepreneur decrease over time making the entrepreneur's specific investment relatively less important. In turn, the more the firm matures the more important advice of the VC on management issue becomes thereby also increasing the relative value contribution of the VC's specific investment.

Expectations on a trade sale occurring can be regarded as a proxy for the likelihood of the exit channel with the most pronounced conflicts of interest. Given that VCs indicate (in the investment memorandum) that they expect a trade sale to occur they are foreseeing potential conflicts of interest making the ex-post bargaining game more important.

The fact that VCs are organized as closed-end funds with a limited life time imposes the pressure on the VC do disinvest before the fund life ends. This is especially true in cases in which the investment round takes place in later periods of the fund's life. The more pressing a sale becomes the weaker the ex-post bargaining position of the VC.

Hence, we interpret the round variable as a proxy for the relative importance of the VC's specific investment, while we consider the VC's expectation on the trade sale as being the most likely exit channel as proxy for the likelihood of the ex-post bargaining game. The closed-end fund variable is interpreted as a proxy for the VC's weakness in the ex-pots bargaining position.

4.1 Rounds

Given that we consider the firm's investment round as a candidate for an indicator of the relative importance of the VC's specific investment we expect to see more exit rights the higher the firm's round.

Table 6 shows the allocation of exit rights across investment rounds. The first indication of a positive relationship between the usage of exit rights and the respective round is given in

panel A. 1 of table 6. In this panel we outline the relationship between exit rights and rounds for all firms. It is obvious that there is a statistically significant upward trend for all trade-sale rights. The increase of exit rights used over rounds is also economically meaningful. For instance, whereas drag-along rights are used in 31 % of all cases in the first round, we observe them in 69 % of all third investment rounds. The usage of take-along rights precisely double from 40% to 80% between the first and third round. This upward trend across rounds can not be observed for the IPO rights.

We split the entire sample according to VC characteristics as we want to find out whether VC selection could be driving the upward trend rather than pure round effects. As table 1 shows, the percentage of independent VCs increases steadily over time. Thus, our results might be simply driven by the fact that public VCs are less professional and there is a mechanical relationship between more exit rights and more independent VCs. Looking at the independent VC subsample only reveals that the pure round effects are statistically somewhat less significant but do not vanish. We still observe a statistically significant increase in the use of exit rights in the third round relative to the first round for all trade sale rights allocated towards the VC. The differences between the first and second as well as between the second and third round are still present and point all in an upward direction, albeit there are fewer statistically significant differences. However, this may be due to the largely reduced number of observations. All in all this leads us to conclude that our results do not seem to be simply driven by the VC's type.

There is, however, a competing explanation for our observation that trade sale rights are more often used in later rounds: this pattern could simply be due to boundedly-rational behavior of the agents involved. Bolton/Faure-Grimaud (2008) take a closer look into this by investigating the allocation of control rights in a framework in which agents face time-costs of deliberating current and future transactions. They develop a theory of endogenously incomplete contracts and show that agents leave some enforceable future transactions unspecified and instead specify which agent has the right to decide these transactions. Thereby, control rights allow to defer time-consuming negotiations and decisions on those transactions to a later date. Their theory let's expect that control rights will be allocated to the more cautious party. Furthermore, their approach indicates that when the contracting agents have more conflicting objectives, equilibrium contracts are more complete, i.e. in our context, trade sale rights should be included in contracts early on. We aim to distinguish between our initial interpretation of the influence of the round variable and this alternative hypothesis based on bounded-rationality later on in our multi-variate analysis.

4.2 Exit Channel Expectations

In table ?? we consider to what degree specific trade sale expectations (i.e expectations on the precise exit channel) drive the allocation of exit rights. It turns out that despite the fact that the VC's investment in the portfolio firm is always of a temporary nature it is only in those cases in which the VC has specific expectations regarding the exit channel that the VC cares about

exit rights in the contract. We interpret trade sale expectations as proxies for the likelihood of the conflict of interest arising with the exit process. This should give them strong enough incentives to include measures into the contract which allow to mitigate or even to eliminate problems associated with the VC's low ex-post bargaining power.

The trade sale expectation variable stems from the investment memorandi in which VC indicate whether they do have expectations with respect to the exit channel. This variable clearly indicates expectations regarding the exit channel rather than the exit timing. This can be seen most clearly by the fact that we observe a very low and even positive correlation between the trade sale expectation variable and the time to exit indicated by the VC (in the investment memorandum as well). The positive correlation coefficient (of 0.05 which is, however, not significant) implies that VC do expect to settle with a trade sale in cases in which the time to exit is expected to be longer.

The observed differences between cases in which VCs expect a trade sale and those in which they do not is not only statistically but also economically significant for all trade sale rights. In all firms, drag-along (tag-along) rights are allocated towards the VC in 62% (73%) of all investments if VCs expect a trade sale to occur while the respective numbers are 33% (44%) if a trade sale is not explicitly expected. If we look only into first round investments, the numbers are reduced but the difference between cases in which a trade sale is expected and cases in which this is not the case even increase slightly. For drag-along rights the numbers are 58% if a trade sale is expected and 24% if this is not the case. The respective numbers for the tag-along right are 71% and 35%.

4.3 Closed-End Fund

We consider the choice of organizational form for the VC as a one further proxy for the presence of a hold-up problem. Closed-end funds force the VC to return its capital to its limited partner after a given period of time. Therefore, VCs being organized as closed-end funds are more prone to be held up the entrepreneur, as they will be less patient than VCs with open-end funds. Table 7 presents evidence that there exists a difference in the use of exit rights between VCs that do not use this organizational form and VCs that use it.

The first panel compares the usage across all those contracts for which we have information about the organizational form. We find that the difference in the usage for drag-along rights is statistically significant at the one percent level. Indeed the sheer magnitude of the difference (56% vs. 12%) shows the importance of this variable. The same result holds for tag-along rights, and VC preemption rights.

When we start to consider first round investments only, pretty much the same picture starts to emerge. As, given our discussion of an increased usage of trade sale rights in higher rounds suggests, the numbers are reduced, but the underlying pattern remains. The differences are, with the exception of the pre-emption right allocated towards the entrepreneur always highly statistically significant

Thus we find strong evidence that all three factors we have considered so far are relevant for the allocation of exit rights. This clearly gives some first indication that trade sale rights indeed are used to provide proper incentives for specific investments (of the VC).

Before we turn to a more detailed multivariate analysis, we take a quick into the the evolution of exit rights over calendar time.

4.4 Periods

Finally, in table 6, Panel B we look at possible changes in the use of exit rights over time. While this is not directly connected to our hypothesis, the fact that the German VC market developed rapidly in the years considered makes it necessary to discern potential learning effects from hold-up. We find that the usage of exit rights increases over (calendar) time.

We interpret this increase of the usage of exit rights over time as learning process. There are several reasons for this. First, there is a continuous increase in the use of these rights, very much in contrast to a change in bargaining power, where one would expect a drop in the second period. Second, as we will show in chapter six, there were no major changes to the relevant laws in Germany.

We should note that the usage of exit rights was legally feasible right from the beginning of our observation period. Baums and Möller (2002) who discuss exit rights from a legal point of view stress that at the time of the initial draft of their article (1999), all types of exit rights discussed were possible in Germany. Additionally, in table 4 we document the year in which we observe each right for the first time in our sample. The first occurrence is for preemption rights as early as 1991. Drag-along and tag-along rights occur as early as 1995 and 1994 respectively. As the majority of our observations stem from the periods after 1998 (400 out of 464) it is clear that there seemed to be no legal obstacles to implement exit rights in German VC contracts right from the beginning.

In the course of this process VCs in the German market seemed to have learned how to address potential problems associated with the exit process and have employed exit rights in more and more contracts. The differences across the three time periods are not only statistically significant but also of pronounced magnitude. Whereas e.g. drag-along rights in the first period (until 1998) are used in only 8 percent of all contracts, this number increases steadily to 33 percent in period 2 (1998 until 2000) and 63 percent in the third period (2001-2004). Pretty much the same pattern can be observed with all other exit rights. ***** This pattern remains intact if we consider only first rounds (see Table table 6, Panel B.2). This controls for the round effect interfering with the time period effect. Indeed, there is a statistically significant difference between the first and third period, although the differences are often not statistically significant between the first and second as well as between the second and third period. As in our previous analysis of round effects the statistical significance disappears for the IPO rights and the preemption right allocated towards the entrepreneur. Once again this has to be seen

against the background of the decrease in sample size in case of our consideration of subsamples.

To sum up, we have shown that VCs use more exit rights for firms that are in higher rounds, for firms for which they have specific exit expectations and for firms that use closed-end funds. We interpret rounds, exit expectations, and the closed-end fund dummy as indicators for the specific investment explanation. Additionally, we show that there are changes in the overall levels of clauses used. We interpret them as evidence for learning, but we also show that learning is not the sole driving force behind the increase in exit rights.

5 Multivariate Analysis

In this section we extend our results from the last section. We now relate the choice of exit rights to firm and VC characteristics. We thereby have two main objectives. First, we want to check whether the hold-up hypothesis is confirmed in the multivariate analysis. Second, we want to analyze whether there are any additional or alternative mechanisms and determinants driving the allocation of control rights.

We focus now on three clauses. We saw in the last section that drag-along and tag-along rights are the most frequently encountered rights in our sample. Additionally, we will consider preemption rights as the final trade-sale right. We proceed in the following way: First, we analyze the determinants of drag-along clauses and tag-along clauses. We employ probit regressions in order to analyze the importance of the hold-up problem. Then we repeat this for all trade sale rights allocated to the VC in our data set: the sum of the VC's preemption right dummy, the drag and tag-along dummies.²¹ For this last part we use an ordered probit regression.

5.1 Main Findings on the Hold-up Hypothesis

We start our analysis with the three main variables from the previous section which we use as proxies for the severity of the hold-up problem: the round variable, the exit expectations and the closed-end funds variable. Models (1), (2) and (3) in table 8 reveal that the effect of these three variables on the probability of using a drag-along right is positive, highly statistically significant and economically pronounced. This remains basically unchanged if we employ three types of control variables: firm characteristics, industry dummies and time period dummies (see Model (4) in table 8).

With respect to industry dummies we employ a dummy for high-tech industries in our sample (summarizing biotechnology, IT and telecommunications as well as other high-tech industries). This approach has proven superior to using pure industry dummies since the latter turned out to show too little in-group variation due to our narrow definition of industries. We measure period effects relative to period 2. As we saw in chapter 5 this is an important control variable

²¹Including the IPO rights would change little but leads to significant losses of observations due to missing data points.

that allows us to filter out potential learning effects. We use the finished-product variable which indicates whether the firm already has a finished product or not at the time the contract is signed as a proxy for firm quality in order to avoid using potentially uninformative balance sheet data. The marginal effects drop in size, but are still significant at the 1 percent level. VCs which do have expectations about the exit mode are 32 percent more likely to include a drag-along clause in their contracts. The difference between the likelihood of including a drag-along clause in the contract increases by 17 percent between the first and the third round (see Model (4) in table 8). Furthermore, investments which are undertaken by VCs organized as closed-end funds are 32 percent more likely to have drag-along rights in the contract compared to investments which are undertaken by VCs being organized as open-end funds.

We interpret this as strong support for the hold-up hypothesis. As discussed before, all three variables can be viewed as indicators for a potential hold-up problem.²² However, this does not allow us to say the same about the validity of the Aghion and Tirole (1997) hypothesis.²³ We should also note, however, that the closed-end fund variable could to some extent also stand for the liquidity needs of the VCs (consistent with Aghion, Bolton, and Tirole (2004)).

Taking a closer look at tables 10 and 12 reveals that the picture is quite the same when we analyze the other two dependent variables, the tag-along right and all sale-rights. With regard to statistical significance, the effects are roughly the same. The economic size of the effects is slightly higher with tag-along clauses for the round variable and marginally lower for exit expectations and the closed-end funds variable compared to drag-along clauses. Exit expectations increase the likelihood of employing tag-along rights by 31 percent while closed-end funds increase it by the same number. The likelihood of using tag-along rights increases from first-round to third-round contracts by 20 percent.²⁴

The control variables in Models (4) of tables 8, 10 and 12 reveal that significantly more exit rights are employed in period 3, thereby supporting our findings from the univariate statistics. The effect of period 1 is always negative, but only statistically significant in some regression in the case of drag-along clauses and in one regression of the all sale-rights variable (see Model (5) in table 13). All this indicates a time trend in the German VC industry with respect to the usage of the exit rights. As discussed in the previous section, one possible interpretation of this effect is learning. This finding also indicates that while there certainly are changes in the usage

²²Since the number of rounds is determined by staged financing choices, the round variable could be considered to be an endogenous variable. Since, however, there is no obvious relationship between staged financing choices and exit rights, we think that higher number of rounds are nevertheless a good proxy for the closeness of the exit decision and hence, for the importance of the hold-up problem.

²³We face the following problem: Exit expectations can be interpreted as a proxy for both the hold-up approach and the information acquisition approach, while the interpretation of rounds and the closed-end fund dummy is unambiguous in the sense that they both proxy for hold-up only. Therefore, as all three variables are significant and go in the same direction, we can be certain that hold-up matters, but we cannot say the same about information acquisition. Furthermore, the information acquisition mechanism would predict a significant difference in the impact of the exit expectations variable on the usage of drag-along and tag-along rights. However, we do not observe such a difference.

²⁴In our ordered probit regression on the determinants of all exit clauses (i.e. in tables 12 and 13) we report coefficients rather than marginal effects. Thereby, we avoid reporting the vast number of marginal effects for all the three realizations of our endogenous variable.

of exit rights over time, hold-up matters nonetheless.

The one control variable that we omit from Model (4) is the independent VC dummy. The reason for that is that the independent VC dummy is highly correlated with the closed-end fund variable. This in turn makes it impossible to include both variables in the same regression. In the next section, however, we will approach the influence of VC characteristics, among other factors, in a lot more detail.

5.2 Alternative explanations

Starting from these findings, we want to investigate whether alternative hypothesis other than hold-up are driving our results. We start by looking into whether VC characteristics can explain the allocation of exit rights. In a second step we investigate the impact of ex-ante bargaining power before we finally turn to entrepreneur characteristics.

5.2.1 VC Sophistication & Reputation:

A first alternative hypothesis is that VC experience or sophistication explain the allocation of exit rights. In particular one might expect that only sophisticated VCs understand the importance exit rights properly and include them in their contracts early on. This seems to be a quite natural concern, given that the German VC market is rather young and developing fast. The answer to this alternative explanation is only partially in the affirmative. We look into three proxies for VC sophistication. First, we use a US-VC dummy. Second, we employ VC age as a proxy for VC sophistication, claiming that more experienced VCs are more sophisticated as well. It turns out that the US-VC variable does not have any statistically significant effect for any of our three cases (see Model (5) in tables 8, 10, and 12). The VC age variable in the respective Models (6) in each of the three tables is always negative and statistically significant, showing that more experienced VCs employ more drag-along, tag-along, and exit rights in general (note that VC age is defined as the VC's founding year, meaning that lower levels reflect more experienced VCs). However, the inclusion of the VC's age leaves our main findings qualitatively unchanged. Given that the VC age variable's significance is very robust across different specifications we include this variable in the following regression and interpret it as a control variable for VC sophistication. Finally, we allow for a proxy of VC reputation: our information variable measures the amount of public information available about the VC. This variable, however, does not reveal any positive impact on our dependent variables (see Models (7) in all three type of regressions).

Finally, one could argue that closed-end funds and exit expectations stand for VC sophistication rather than for a hold-up problem. In order to test this issue, we pursue the following strategy. First, we replace the closed-end fund variable with our fund age variable. Second, since we can not easily replace the exit expectations variable we also employ as many additional proxies for VC sophistication, such as VC age and the information variable, as possible.²⁵ Fund age is a natural

²⁵The usual way to deal with this unobserved heterogeneity would be to use VC fixed effects. The main problem

extension of the closed-end fund dummy, as it looks at how long ago the last fund closing took place.²⁶ This should allow us to break the possible link between experience and organizational form, as the latest fund closing should be less directly dependent upon VC sophistication, while it emphasizes the possible hold-up problem.²⁷ What we find is quite reassuring (see Models (10)): for both the drag-along and the tag-along right, fund age is highly significant and shows the correct sign, while it has the right sign for our general exit rights variable but the significance level is just below the 10 percent level. Also, we find that several other variables that control for VC sophistication are significant, such as VC age: older VCs are more likely to include exit rights. The same is true for all exit rights.

5.2.2 Syndication Structure:

Furthermore, we are interested to what extent the *syndication structure* affects the usage of exit rights. The intuition behind this is that we may actually consider the wrong hold-up problem: possibly it is not the entrepreneur but fellow VCs that will hold each up or both problems could persist at the same time. Therefore, a larger syndicate may indicate a more pronounced hold-up problem. Model (9) in table 8 displays the positive but insignificant effect of the syndication variable while leaving all the previous estimates in place. This can be interpreted as support for the fact that the hold-up problem exists between the VC and the entrepreneur rather than among the VCs. This picture is replicated with the tag-along clause and the all exits rights variable (see Model (9) in tables 10 and 12). Our previous findings, especially those reflecting the hold-up problem between the VC and the entrepreneur (round and planned exit variables) are essentially unaffected.

5.2.3 Ex-ante Bargaining power:

A further important competing hypothesis is that usage of exit-right is simply driven by the amount of *ex-ante bargaining power* that the VC holds. If he musters a lot, the VC might be able to include more favorable terms in the contract. We take a closer look at this alternative by investigating a number of proxies for the distribution of bargaining power between the entrepreneur and the VC. The first candidate is the period 2 dummy (1998-2000). It is a proxy for the boom period in the global high-tech and VC markets. In this period many newly entered VCs competed with established VCs in what became known as 'money chasing deals' (see Gompers and Lerner (2000)). For all three types of regressions (see Models (8) in tables 8, 12 and 10) we find a negative and significant effect of the period 2 variable. This indicates that during this time period VCs indeed were able to include – relative to the two other time periods – less

we have with this specification is that we do not observe most VCs often enough to run a Logit model with fixed effects.

²⁶For open-end funds, the natural coding in this case is zero.

²⁷The reason we normally do not use fund age is that its results are somewhat less intuitive to interpret than the closed-end fund dummy.

drag-along and tag-along rights in general. This provides some initial evidence of the importance of the bargaining hypothesis.

However, given our previous findings on learning, this may simply reflect a learning process over time. In order to provide more support for the bargaining hypothesis, we look into the effects of fund inflows into the German VC market. Against the background of the bargaining power hypothesis we would expect that VCs will have low bargaining power when there are high fund inflows and hence will be able to include only comparatively few exit rights in the contract. This view is only partially validated in our regressions which reveal a negative coefficient (see Models (11) in tables 9, 11, and 13). The coefficient is, however, never significant.

One further proxy for ex-ante bargaining power is the VC majority variable: when the VC holds a majority of the firm's voting rights, this could indicate that the VC has more bargaining power at the contracting stage. This in turn could lead to more exit rights allocated towards the VC. Note that in chapter six we will argue that voting shares are not necessarily *substitutes* for exit rights. Our regressions support this view. Models (12) in tables 9, 11, and 13 show that the positive effect of the VC majority variable is statistically significant at least at a 5 percent level. A VC with a majority of voting rights is 32 (21) percent more likely to get granted a drag-along right (tag-along right) compared to a VC without a majority of voting rights. We are aware of the fact that the majority variable is potentially prone to an endogeneity problem, but consider it is a further piece in a mosaic showing that more ex-ante bargaining of the VC leads to more exit rights allocated towards the VC.

Finally, to rule out that there is a pure mechanical relationship between more rounds, higher VC ownership stakes and more bargaining power that drives the inclusion of the trade-sale rights, we re-run our analysis for first rounds only (see Models (13) in tables 9, 11, and 13). In this case we can exclude the possibility that a higher round only occurred because of negative news and these negative news give the VC more bargaining power. This effect should not exist in the first round. We find that even when we only consider first round investments, our remaining proxies (closed-end funds and exit expectations) for the hold-up problem remain significant and point in the right direction.

Note, however, that regardless of including any of the bargaining power variables this leaves the hold-up variables – with the exception of the significance level of the round variable in the last set of regressions²⁸ – materially unchanged. That is, while we find evidence that bargaining power matters, we can show that our original indicators for the hold-up problem remain to be significant in almost all cases, validating our initial hypothesis that hold-up matters.

²⁸Including the VC majority variable leads to a drop of the significance level of the round variable below the ten percent level. Given the pronounced collinearity of the two variables (in higher rounds VCs are most likely to have accumulated a higher share in the company) this is not really surprising.

5.2.4 Firm Quality & Pledgeable Income:

Another simple alternative story for the use of trade-sale rights could be differences in firm quality. One idea could be that firms that go public are more profitable than firms that are sold (Bienz (2005)), and thus less profitable firms are the ones that require exit rights. Ideally we would like to employ a variable that captures the VC's expectations about the firm's future net present value. Unfortunately such a variable is extremely hard to come up with and would, given the nature of the VC industry, most likely be quite unreliable. Therefore we resort to several other measures to rule out this competing hypothesis. First, instead of using a trade-sale dummy, we focus on exit-expectations throughout our entire multivariate analysis. Thus, in all our regressions, we only ask whether the VC has a plan, not whether he expects a trade-sale in particular. This should eliminate any direct link between exit choice and firm quality as an exit plan could also be pursuing an IPO. Second, we directly control for firm quality using the finished product dummy and indirectly using the industry dummies. We find that this dummy is significant in a variety of models and setups, but that this does not affect the validity of our proxies for a hold-up problem. Finally, we find that for first rounds, when *future* firm quality should matter the least (and the finished product dummy should capture *current* quality quite well), that our results still hold (see Models (13) in all our three regressions).

We also need to consider the *pledgeable income hypothesis*. This alternative explanation rests on an application of the Aghion/Bolton model (see Aghion and Bolton (1992)) and views exit rights as a means to allow the VC to fulfill his participation constraint. We use two measures for pledgeable income: the fixed asset ratio variable and the size of the firm's balance sheet. These two balance sheet variables stand as proxies for the amount pledgeable assets (and hence future income) available. Our regression analysis shows that these variable do not only reveal to have an insignificant impact on our dependent variables – with the exception of the balance sheet variable for all exit rights (see Models (14) in tables 9, 11, and 13.) but also partially have the wrong sign (this is always true for the balance sheet variable and in the case of the drag-along clause for the fixed-asset ratio as well).

It is important to stress, however, that one could also interpret the finished product dummy as a proxy for (non-)pledgeable income, and not only as a proxy for firm quality per se. As already discussed it is significant in the majority of our regressions for the drag-along rights (see table 8 and 9) and has the right sign. This can be interpreted as supporting evidence for the pledgeable income hypothesis, or it could provide support for the firm quality hypothesis. However, as noted before and more importantly, our original hypothesis that hold-up matters is still valid.

5.2.5 Entrepreneur Characteristics:

One other explanation that could drive our results is the fundamental uncertainty about the *entrepreneur's preferences*. Is the entrepreneur willing to give up control and how important is he for the venture? We consider two potential proxies for this. The repeat entrepreneur variable

shows to what extent the entrepreneur was willing to give up control previously, indicating rather low private benefits of control. In this case, we would expect rather little obstacles against the VC's exit decision and hence, few exit rights. The entrepreneur-expert variable, in turn, controls for the inalienability of the entrepreneur's human capital. In this case, the entrepreneur might be too important for the firm and exit rights might be useless. Therefore we would expect a negative correlation.

Both variables turn out not to matter at all (see Models (15) in all three tables).

Overall, we find strong support for the hold-up hypothesis. This is again underlined by the fact that all three variables are both statistically and economically significant. This indicates that the possible occurrence of a hold-up problem determines the allocation of trade sales rights. We found that it is the hold-up problem between the VCs and the entrepreneur rather than any hold-up among VCs which is responsible for the allocation of exit rights. In addition, it turned out that there are further explanation and determinants behind the usage of control rights (such as VC experience, VC bargaining power, and, to some degree, pledgeable income) but these determinants complement rather than replace our main hold-up explanation.

6 Substitutes for Exit Rights

Put-options can be extremely valuable in closing down a non-successful venture and are often regarded as an alternative to explicit exit rights. We think that at least in Germany for several reasons the latter is not the case. First, for AGs there are limitations to the total amount of shares that can be repurchased. In Germany an AG is restricted to repurchasing not more than 10% of all outstanding shares (§71 (1.8) AktG). Second, the firm (regardless of its form of incorporation) must have enough capital reserves on its balance sheet (§71 (2.1) AktG and §33 (2) GmbHG) in order to pay for any shares repurchased. As early stage firms often have negative registered equity on their balance sheet, the effectiveness of put-options is at least very questionable. Alternatively, one could imagine that the entrepreneur, rather than the firm, issues the put-options. Thus the VC might be able to threaten the entrepreneur with personal bankruptcy. The effectiveness of such a move is highly questionable both in its legal and time dimension. These legal complications warrant the conclusion that one should not expect put-options to be frequently used in Germany.

Finally, one might imagine that voting- or board rights might be able to substitute for trade-sale rights. However, with respect to exit rights, this is normally not true. Generally speaking shareholders in Germany are more powerful than their American counterparts. In particular, any coalition of shareholders of an AG combining more than 10% of all shares (with a GmbH the threshold is 5%) can demand a shareholder's meeting (§AktG 122 and §GmbHG 50). Also, shareholders have the right to demand a vote on important corporate decisions. Shareholders also have to agree to a liquidation of the firm (§60 GmbHG and §262 AktG).²⁹ As shareholders

²⁹Shareholders have a veto right in 92% of all cases in our data sample in addition to the rights laid down in

cannot be forced to sell the firm, the only other way would be a partial sale. However, a major sale of assets can normally be vetoed by individual shareholders as well.³⁰ Overall, this makes board rights much less effective than exit rights.

That is, we find that neither board rights nor put options can act as substitutes for trade-sale rights.

7 Conclusion

In this paper we analyze the allocation of exit rights in VC contracts. We thus extend the work of Smith (2005) on venture capital exits and Kaplan and Strömberg (2003) on venture capital contracts. We introduce a new data-set of VC contracts from Germany that is build from a base population that covers approximately 60% of the German VC market from 1990-2004. Within this sample we analyze the determinants for the allocation of exit rights.

Our paper makes the following contributions to the existing literature:

First, we show that hold-up plays a crucial rule in explaining the use of exit rights, as modelled by Chemla, Habib, and Ljungqvist (2007). This is independent of whether we control for other hypothesis, such as bargaining power, VC sophistication, the structure of the VC syndicate, firm quality, pledgeable income, and entrepreneur characteristics. Additionally, we provide evidence that our interpretation of the dependent variables as proxies for the presence of a hold-up problem is indeed warranted. Our results are in line with two contemporaneous papers (Lerner and Malmendier (2007) and Hotchkiss, Qian, and Song (2005)) that document the same link between option-style contract clauses and potential hold-up in research alliances and in merger contracts respectively.

Second, exit rights are allocated to the VC, not the entrepreneur. This is in line with much of the theoretical literature on venture capital, but is in contrast to the literature on large shareholders.

Third, our results are robust for different types of exit rights and they also indicate that the different exit rights are complements, rather than substitutes.

Fourth, we use several different proxies for the possibility of hold-up: the round the firm is in, the presence of exit-expectations and the VC's organizational form, that is whether he finances himself via a closed-end fund or not. For all three proxies we observe that they are related to an increase in the use of exit rights. This also allows us, for the first time, to show that there is a link between the VC's organizational structure, hold-up and the contractual form: the VC's organizational structure may make the VC more prone to hold-up. Our results indicate that VCs attempt to alleviate this by including more exit rights in their contracts with entrepreneurs.

Finally, our results also indicate that hold-up is not the only force that drives the use of exit rights. In particular, the VC's liquidity needs, as proposed by Aghion, Bolton, and Tirole (2004),

the respective company laws.

³⁰This is a standard provision in firm charters and is employed in 81% of all contracts in our sample

the VC's amount of bargaining power, and the amount of pledgeable income in the sense of Aghion and Bolton (1992) also seem to influence the use of exit rights. However, we show that syndication, VC sophistication, and entrepreneurial characteristics do not seem to affect the use of exit rights.

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Tables

Table 1: VC Summary Statistics

# of financing rounds			464
# of VCs			91
# of Firms financed	$\bar{\emptyset}$		5
	Median		2
VC founding year	$\bar{\emptyset}$		1989
	Median		1993
Closed End Funds		240	60%
US VC		29	6.5%
Information	$\bar{\emptyset}$		2.53
	Median		3
VC Type	Period 1	Period 2	Period 3
Independent VC	37.31	63.92	69.29
Public VC	35.82	20	16.43
Captive VCs	26.87	16.08	14.28

Notes: Summary statistics for 464 investment rounds into 290 entrepreneurial firms by venture capital funds. The statistics given are the averages per round, not per firm. Thus, for example, 29 firms were financed by US VCs and 240 firms were financed by VCs that have a closed-end fund structure. Information is the sum of whether the firm has a web-page, is a member of the German and/or European Venture Capital Association or whether there is information available in Thomson Venture Economics. Thus the index has a range from zero to four.

Table 2: Firm Summary Statistics

Number of portfolio firms		290
# of financing rounds		464
Total size of investment	$\bar{\emptyset}$	TEUR 5403
	Median	TEUR 1305
Age	$\bar{\emptyset}$	4.77
	Median	3.00
Stages	Early	66.5%
Legal form	GmbH	70%
	AG	28%
	Others	2%
Origin	Germany	92%
	France	1%
	UK	2%
	Others	5%
Industry	Bio/Biotech	5%
	Medicine	12%
	IT/Software	27%
	Telecom	6%
	Internet	10%
	Auto/Eng	15%
	Chemistry	4%
	Others	14 %
Syndication	$\bar{\emptyset}$	39%
	# of partners	3.69
	Median	3.00

Notes: Summary statistics for 464 investment rounds into 290 entrepreneurial firms by venture capital funds. The statistics given are the averages per round, not per firm. For staging and staging modes first column refers to the number of observations and the second to the percentage.

Table 3: Variable and data description

Variable	Variable description
<i>Firm and entrepreneur characteristics</i>	
FINISHED PRODUCT	Firm has a product which can be sold
HIGH-TECH INDUSTRIES	Either BIOTECH, IT/Telecoms or traditional high-tech
BALANCE SHEET SIZE	Measuring the total size of the balance sheet
FAR	Ratio of fixed assets to balance sheet total
REPEAT ENTREPRENEUR	Founder has already run a firm
E-EXPERT	Dummy that indicates whether the entrepreneur's human capital is important in the firm. It takes value one if it is high-tech firm, at least one founder has a research degree and there does not yet exist a finished product.
<i>Investment and VC characteristics</i>	
INDEPENDENT, PUBLIC VC	VC being an independent or public VC
CAPTIVE VC	Bank-dependent and corporate VC
US VC	Dummy indicating whether the VC firm is located in the US or not
VC AGE	VC age measured by the founding year of the VC firm
FUND AGE	Difference between time at which current contract was signed and at which last funds of the VC was closed
CLOSED END FUNDS INFORMATION	Dummy indicating whether funds is organized as closed-end funds
	Measures the amount of public information available about the VC. It is the sum of whether the firm has a web-page, is a member of the German and/or European Venture Capital Association or whether there is information available in Thomson Venture Economics. Thus the index has a range from zero to four.
VC MAJORITY	Dummy indicating VC majority in the shareholders meeting
SYNDICATE SIZE	Number of VCs in the syndicate
ROUND	Indicating the number of financing rounds through which the firm has already gone
PERIOD 1, 2, 3	Financing has taken place before 1998, between 1998 and 2000; after 2000
<i>Exit rights</i>	
DEMAND RIGHT	VC has senior rights to list his shares in the case of an IPO
TAG-ALONG	Dummy indicating whether the contract contains a take along right for the VC
DRAG-ALONG	Dummy indicating whether the contract contains a drag along right for the VC
PRE EMPTION RIGHT	Dummy indicating whether the VC (or the entrepreneur) has a pre emption right
PIGGY BACK RIGHT	Dummy being one (zero) if the VC possesses such a right. (or not)
<i>Other Variables</i>	
FUND INFLOWS	Measures aggregate fund flows into the German VC market
EXIT PLANNED	Dummy indicating whether the VC has an expectation about which form his exit could take place
Sources	
Firm Characteristics	Details of contracts used
VC Characteristics	VC websites and Thomson Financials Venture Economics

Table 4: Exit right occurrence and correlations

	First Use	Descriptive Stats			Correlations				
		Obs	Mean	SD	(1)	(2)	(3)	(4)	(5)
VC preemption (1)	1991	405	0.66	0.47	1				
E preemption (2)	1991	405	0.32	0.47	0.49***	1			
Drag-Along (3)	1995	413	0.39	0.49	0.57***	0.27***	1		
Tag-Along (4)	1994	412	0.50	0.50	0.67***	0.30***	0.70***	1	
Piggy back (5)	1999	383	0.03	0.17	0.12**	0.08***	0.22	0.17***	1
Demand (6)	2000	337	0.03	0.16	0.15*	0.11*	0.21***	0.16***	0.59***
					319	319	326	327	329

Notes: Summary statistics and piecewise correlations for exit covenants for 464 investment rounds into 290 entrepreneurial firms by venture capital funds. There is a maximum of two IPO rights (Piggy Back Rights and Demand rights) while there are four relevant trade-sale rights: Preemption Right, Drag-Along Right, Tag-Along Right and Anti-Dilution Protection. The left panel of the paper presents the first year we observe the right and basic summary statistics. The right panel presents the correlations of the rights (upper row), the number of observations (lower row), and statistical significance. We use *, **, and *** to denote significance at the 10%, 5% and 1% levels, respectively.

Table 5: Exit Rights: Usage across VCs

	Percentiles		
	Drag-Along	Tag-Along	All Rights
1%	0	0	0
5%	0	0	0
10%	0	0	0
25%	0	.2	1
50%	.4	.5	1.75
75%	0.75	0.87	2.43
90%	0.92	1	2.92
95%	0.92	1	3
99%	1	1	3
Observations	455	458	453

Notes: In this table we present the average usage of drag-along, tag-along, and all exit rights across VCs. To do so, we create a variable that depicts the usage of these rights across the different portfolio firms for each VC, and then we consider the distribution.

Table 6: Descriptive Variables: Rounds and Periods

Panel A: Rounds															
Panel A.1: All firms															
Category	Variable	Full Sample			1st Rounds only			2nd Rounds only			3rd Rounds and more				
		Obs	Mean	Std. Dev.	Obs	Mean	Std.Dev.	Obs	Mean	Std. Dev	Obs	Mean	Std. Dev		
Sale Rights	VC preemption	405	0.66	0.47	251	***	0.57	+++	104	∞	0.57	0.42	50	0.90	0.30
	E preemption	405	0.32	0.47	251		0.29	+	104		0.29	0.48	50	0.42	0.50
	Drag-Along	413	0.39	0.49	255	**	0.31	+++	107	∞∞	0.31	0.50	51	0.69	0.47
	Tag-Along	412	0.50	0.50	254	***	0.40	+++	107	∞∞	0.40	0.50	51	0.80	0.40
IPO Rights	Piggy back	383	0.03	0.17	230		0.02		103		0.02	0.19	50	0.06	0.24
	Demand	337	0.03	0.16	204		0.02		91		0.02	0.21	42	0.02	0.15
Panel A.2: Firms financed by independent VCs:															
Sale Rights	VC preemption	247	0.77	0.42	142	***	0.70	+++	70		0.46	0.35	35	0.91	0.28
	E preemption	247	0.34	0.47	142		0.32		70		0.47	0.48	35	0.37	0.49
	Drag-Along	248	0.56	0.50	142		0.50	+++	70	◦	0.50	0.50	36	0.78	0.42
	Take-Along	247	0.63	0.48	141		0.56	+++	70	◦	0.50	0.47	36	0.83	0.38
IPO Rights	Piggy back	237	0.03	0.17	133		0.03		69		0.17	0.17	35	0.03	0.17
	Demand	197	0.04	0.19	109		0.04		58		0.19	0.18	30	0.03	0.18
Panel B: Periods															
Panel B.1: All firms															
Category	Variable	Full Sample			1st Period			2nd Period			3rd Period				
		Obs	Mean	Std. Dev.	Obs	Sig	Mean	Sig	Mean	Std. Dev	Obs	Sig	Mean	Std. Dev.	
Sale Rights	VC preemption	405	0.66	0.47	60	***	0.40	+++	215	∞∞∞	0.63	0.48	128	0.84	0.37
	E preemption	405	0.32	0.47	60		0.22	+++	215	◦	0.30	0.46	128	0.41	0.49
	Drag-Along	413	0.39	0.49	61	***	0.08	+++	223	∞∞∞	0.33	0.47	127	0.63	0.48
	Tag-Along	412	0.50	0.50	61	***	0.21	+++	221	∞∞∞	0.45	0.50	128	0.73	0.45
IPO Rights	Piggy back	383	0.03	0.17	51		0.00	+++	208	∞∞	0.01	0.12	123	0.07	0.25
	Demand	337	0.03	0.16	52		0.00	+++	183	∞∞	0.01	0.10	101	0.07	0.26
Panel B.2: First rounds only															
Sale Rights	VC preemption	251	0.57	0.50	17	**	0.41	+++	90		0.51	0.46	35	0.83	0.38
	E preemption	251	0.28	0.45	17	**	0.12	++	90		0.33	0.47	35	0.40	0.50
	Drag-Along	255	0.31	0.46	17		0.29	++	92	◦	0.48	0.50	33	0.67	0.48
	Tag-Along	141	0.56	0.50	17		0.41	+	90	◦	0.53	0.50	34	0.71	0.46
IPO Rights	Piggy back	133	0.03	0.17	15		0.00	+	85		0.00	0.11	33	0.09	0.29
	Demand	109	0.04	0.19	15		0.00		69		0.00	0.17	25	0.08	0.28

Notes: Summary statistics for 464 investment rounds into 290 entrepreneurial firms by 91 German venture capital funds. The first section states the results for the complete sample, the other three are for all observations in the first, second and third or higher rounds respectively. ***, **, * denotes statistical significance at the 1%, 5%, and 10% level respectively for the difference between the first and second round. +, ++, +++ is the equivalent for the difference between the first and third round, while ∞∞∞, ∞∞, ◦ denotes statistical significance between the second and third round.

Table 7: Descriptive Variables: Closed-End Funds and Trade Sale Expectations

Panel A: Closed-End Funds												
Panel A. 1: All firms												
Category	Variable	Full Sample			Closed-End Fund			No Closed-End Fund				
		Obs	Mean	Std. Dev.	Obs	Sig.	Mean	Std.Dev.	Obs	Mean	Std. Dev	
Sale Rights	VC preemption	359	0.67	0.47	220	***	0.78	0.41	139	0.50	0.50	
	E preemption	359	0.33	0.47	220	**	0.37	0.48	139	0.26	0.44	
	Drag-Along	369	0.39	0.49	222	***	0.56	0.50	147	0.12	0.33	
	Tag-Along	366	0.51	0.50	220	***	0.67	0.47	146	0.26	0.44	
IPO Rights	Piggy back	340	0.03	0.18	208		0.02	0.15	132	0.05	0.21	
	Demand	294	0.03	0.17	167		0.03	0.17	127	0.03	0.18	
Panel A. 2: First rounds												
Sale Rights	VC preemption	215	0.57	0.50	119	***	0.69	0.46	96	0.43	0.50	
	E preemption	215	0.28	0.45	119		0.33	0.47	96	0.23	0.42	
	Drag-Along	220	0.30	0.46	119	***	0.48	0.50	101	0.10	0.30	
	Tag-Along	218	0.40	0.49	118	***	0.58	0.50	100	0.20	0.40	
IPO Rights	Piggy back	198	0.02	0.14	111		0.03	0.16	87	0.01	0.11	
	Demand	84	0.01	0.11	61		0.02	0.13	23	0.00	0.00	
Panel B: Trade Sale Expectations												
Panel B. 1: All firms												
Category	Variable	Full Sample			Trade Sale Expected			Trade Sale not expected				
		Obs	Mean	Std. Dev.	Obs	Sig.	Mean	Std.Dev.	Obs	Mean	Std. Dev	
Sale Rights	VC preemption	359	0.65	0.48	90	***	0.59	0.50	269	0.59	0.49	
	E preemption	359	0.31	0.46	90	***	0.54	0.50	269	0.23	0.42	
	Drag-Along	364	0.40	0.49	89	***	0.62	0.49	275	0.33	0.47	
	Tag-Along	363	0.51	0.50	90	***	0.73	0.44	273	0.44	0.50	
IPO Rights	Piggy back	338	0.03	0.18	84	*	0.07	0.26	254	0.02	0.14	
	Demand	96	0.07	0.26	63		0.06	0.25	33	0.09	0.29	
Panel B. 2: First rounds												
Category	Variable	Full Sample			Trade Sale Expected			Trade Sale not expected				
		Obs	Mean	Std. Dev.	Obs	Sig.	Mean	Std.Dev.	Obs	Mean	Std. Dev	
Sale Rights	VC preemption	223	0.57	0.50	50	***	0.80	0.40	173	0.50	0.50	
	E preemption	223	0.28	0.45	50	***	0.56	0.50	173	0.20	0.40	
	Drag-Along	225	0.32	0.47	48	***	0.58	0.50	177	0.24	0.43	
	Tag-Along	225	0.43	0.50	49	***	0.71	0.46	176	0.35	0.48	
IPO Rights	Piggy back	203	0.02	0.14	45		0.04	0.21	158	0.01	0.11	
	Demand	96	0.07	0.26	63		0.06	0.25	33	0.09	0.29	

Notes: Summary statistics for 464 investment rounds into 290 entrepreneurial firms by 91 German venture capital funds. The first section states the results for all funds for which we have information about the organizational form, the second for VCs that utilize a closed-end fund and the third for firms that do not use closed-end funds. ***, **, * denotes statistical significance at the 1%, 5%, and 10% level respectively for the difference between VCs with and without closed-end funds. round.

Table 8: The determinants of the use of Drag-Along Clauses

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$
Round	0.15*** (0.04)			0.08** (0.03)	0.09** (0.03)	0.09** (0.03)	0.09*** (0.04)	0.11*** (0.03)
Exit Planned		0.48*** (0.05)		0.32*** (0.07)	0.33*** (0.07)	0.32*** (0.08)	0.35*** (0.08)	0.39*** (0.07)
Closed-End Fund			0.44*** (0.06)	0.32*** (0.07)	0.30*** (0.07)	0.29*** (0.08)	0.26*** (0.08)	0.26*** (0.07)
US-VC				0.03 (0.14)				
VC Age						-0.01** (0.00)	-0.01** (0.00)	-0.01*** (0.00)
Information						-0.04 (0.04)	-0.04 (0.04)	
Finished Product								
High-tech Industries								
Period 1								
Period 2								
Period 3								
Obs. Probability	0.39	0.40	0.39	0.40	0.40	0.42	0.42	0.41
Pred. Probability	0.38	0.36	0.36	0.32	0.30	0.34	0.36	0.34
No of Obs.	413	364	369	315	306	306	299	306
Wald / χ^2 / F-Test	16.96***	49.13***	47.12***	77.61***	68.82***	69.95***	70.67***	68.95***
Pseudo R^2	0.0479	0.1876	0.1607	0.3464	0.3549	0.3548	0.3583	0.3264

Notes: Probit regression with clustered standard errors at firm-level. Marginal effects are indicated. Standard errors clustered at firm level in parentheses. We use *, **, and *** to denote significance at the 10%, 5% and 1% levels (for a two-sided test), respectively. Dependent variable is the DRAG-ALONG DUMMY that takes value one when this right is present. The variable ROUND indicates the round the investment is in. The PLANNED EXIT DUMMY indicates whether the VC has an expectation about which firm his exit could take place. CLOSED-END FUND is a dummy for closed- vs open-end funds. VC AGE captures the year the VC founded his firm. INFORMATION finally measures the amount of public information available about the VC. US-VC is a dummy for a VC based in the US, UK or Ireland. The variable FINISHED PRODUCT indicates whether the firm has a product that can be sold. Also, we observe the year when the financing round is closed and define three time dummies. The dummy HIGH-TECH INDUSTRIES is a dummy variable that indicates whether the firm's industry is research intensive, that is whether it is a Biotech, IT/Telecoms or a Traditional High-Tech firm. PERIOD 1 takes value one if the financing round was closed during the early period of relatively low venture capital activity, namely before 1998, PERIOD 2 if it was closed during the boom, i.e. between 1998 and 2000 and PERIOD 3 if it was closed after 2000 - a period of relative decline and reorganization of the venture capital industry.

Table 9: The determinants of the use of Drag-Along Clauses

	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15
	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$
Round	0.08** (0.04)	0.09** (0.04)	0.08** (0.03)	0.05 (0.04)		0.10** (0.04)	0.08** (0.04)
Exit Planned	0.29*** (0.08)	0.36*** (0.08)	0.32*** (0.08)	0.28*** (0.08)	0.28*** (0.08)	0.22** (0.09)	0.32*** (0.08)
Closed-End Fund	0.28*** (0.08)		0.28*** (0.08)	0.27*** (0.08)	0.22*** (0.08)	0.30*** (0.08)	0.27*** (0.08)
VC Age	-0.01** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01** (0.00)	-0.01* (0.00)	-0.01** (0.00)
Syndicate Size	0.01 (0.02)						
Fund Age		0.09*** (0.03)					
Information		-0.01 (0.04)					
Fund Inflows		-2.E-05 (0.00)	-2.E-05 (0.00)				
VC Majority				0.32*** (0.10)	0.24** (0.13)		
FAR						0.05 (0.16)	
Balance Sheet Size						7.E-08 (0.00)	
Repeat Entrepreneur							0.01 (0.10)
E-Expert							0.07 (0.10)
Finished Product	-0.15* (0.08)	-0.15* (0.08)	-0.16 (0.08)	-0.12 (0.08)	-0.07 (0.08)	-0.15* (0.09)	-0.10 (0.08)
High-tech Industries	0.14 (0.08)	0.10 (0.09)	0.15* (0.08)	0.13 (0.09)	0.05 (0.09)	0.20* (0.09)	0.14 (0.09)
Period 1	-0.22* (0.10)	-0.28 (0.13)	-0.25* (0.10)	-0.20 (0.11)	-0.10 (0.11)	-0.17 (0.12)	-0.19 (0.12)
Period 3	0.21*** (0.08)	0.23** (0.09)	0.29*** (0.09)	0.19** (0.08)	0.17* (0.10)	0.29*** (0.08)	0.26*** (0.08)
Obs. Probability	0.41	0.44	0.41	0.42	0.34	0.40	0.43
Pred. Probability	0.35	0.40	0.34	0.36	0.26	0.33	0.36
No of Obs.	287	274	303	301	175	218	263
Wald χ^2 /F-Test	66.17***	50.49***	66.51***	77.44***	59.30***	56.65***	66.87***
Pseudo R^2	0.3373	0.3243	0.3541	0.3948	0.3315	0.3550	0.3502

Notes: Probit regression with clustered standard errors at firm-level. Marginal effects are indicated. Standard errors clustered at firm level in parentheses. We use *, **, and *** to denote significance at the 10%, 5% and 1% levels (for a two-sided test), respectively. Dependent variable is the DRAG-ALONG DUMMY that takes value one when this right is present. The variable ROUND indicates the round the investment is in. The PLANNED EXIT DUMMY indicates whether the VC has an expectation about which form his exit could take place. CLOSED-END FUND is a dummy for closed- vs open-end funds. SYNDICATE SIZE records the number of VCs financing the firm currently. VC MAJORITY is a dummy variable that takes value one when the VC attains a majority in the current round. US-VC is a dummy for a VC based in the US, UK or Ireland. FUND INFLOWS control for aggregate fund flows into the German VC market. INFORMATION finally measures the amount of public information available about the VC. FAR is the ration of fixed assets to the size of the balance sheet. FUND AGE looks at the distance (in years) between the last fund closing and investment in the current portfolio firm. VC AGE captures the year the VC founded his firm. BALANCE SHEET SIZE controls for the size of the firm's balance sheet. REPEAT ENTREPRENEUR controls whether any of the founders has been a CEO or owner of a firm before. E-EXPERT is a dummy that indicates whether the entrepreneur's human capital is important in the firm. It takes value one if it is high-tech firm, at least one founder has a research degree and there does not yet exist a finished product. The variable FINISHED PRODUCT indicates whether the firm has a product that can be sold. Also, we observe the year when the financing round is closed and define three time dummies. The dummy HIGH-TECH INDUSTRIES is a dummy variable that indicates whether the firm's industry is research intensive, that is whether it is a Biotech, IT/Telecoms or a Traditional High-Tech firm. PERIOD 1 takes value one if the financing round was closed during the early period of relatively low venture capital activity, namely before 1998, PERIOD 2 if it was closed during the boom, i.e. between 1998 and 2000 and PERIOD 3 if it was closed after 2000 - a period of relative decline and reorganization of the venture capital industry.

Table 10: The determinants of the use of Tag-Along Clauses

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$	$\partial f / \partial x$
Round	0.18*** (0.04)			0.10** (0.05)	0.10** (0.05)	0.10** (0.05)	0.12** (0.05)	0.12*** (0.04)
Exit Planned		0.49*** (0.06)		0.31*** (0.09)	0.32*** (0.09)	0.30*** (0.09)	0.29*** (0.10)	0.37*** (0.09)
Closed-End Fund			0.41*** (0.06)	0.31*** (0.08)	0.31*** (0.08)	0.29*** (0.08)	0.34*** (0.08)	0.25*** (0.08)
US-VC				-0.01 (0.15)				
VC Age					0.00 (0.00)	0.00 (0.00)	-0.01* (0.01)	-0.01 (0.00)
Information							-0.10** (0.04)	
Finished Product				-0.04 (0.08)	-0.04 (0.08)	-0.05 (0.08)	-0.05 (0.08)	-0.04 (0.08)
High-tech Industries				0.18* (0.09)	0.18* (0.09)	0.19** (0.09)	0.18* (0.10)	0.19** (0.09)
Period 1				-0.17 (0.11)	-0.21* (0.11)	-0.15 (0.12)	-0.13 (0.12)	
Period 2								-0.13** (0.07)
Period 3				0.24*** (0.07)	0.23*** (0.07)	0.23*** (0.07)	0.19** (0.07)	
Obs. Probability	0.50	0.51	0.51	0.52	0.52	0.53	0.53	0.53
Pred. Probability	0.50	0.50	0.50	0.51	0.51	0.54	0.53	0.53
No of Obs.	412	363	366	312	303	303	296	303
Wald / χ^2 / F-Test	17.26***	42.68***	33.58***	102.84***	96.16***	95.46***	98.34***	79.92***
Pseudo R^2	0.0577	0.1725	0.1189	0.2994	0.2842	0.3031	0.3076	0.2614

Notes: Probit regression with clustered standard errors at firm-level. Marginal effects are indicated. Standard errors clustered at firm level in parentheses. We use *, **, and *** to denote significance at the 10%, 5% and 1% levels (for a two-sided test), respectively. Dependent variable is the TAG-ALONG DUMMY that takes value one when this right is present. The variable ROUND indicates the round the investment is in. The PLANNED EXIT DUMMY indicates whether the VC has an expectation about which firm his exit could take place. CLOSED-END FUND is a dummy for closed- vs open-end funds. VC AGE captures the year the VC founded his firm. INFORMATION finally measures the amount of public information available about the VC. US-VC is a dummy for a VC based in the US, UK or Ireland. The variable FINISHED PRODUCT indicates whether the firm has a product that can be sold. Also, we observe the year when the financing round is closed and define three time dummies. The dummy HIGH-TECH INDUSTRIES is a dummy variable that indicates whether the firm's industry is research intensive, that is whether it is a Biotech, IT/Telecoms or a Traditional High-Tech firm. PERIOD 1 takes value one if the financing round was closed during the early period of relatively low venture capital activity, namely before 1998, PERIOD 2 if it was closed during the boom, i.e. between 1998 and 2000 and PERIOD 3 if it was closed after 2000 - a period of relative decline and reorganization of the venture capital industry.

Table 11: The determinants of the use of Tag-Along Clauses

	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15
	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$	$\partial f/\partial x$
Round	0.09** (0.04)	0.12** (0.05)	0.09* (0.05)	0.08 (0.05)		0.09* (0.05)	0.09* (0.05)
Exit Planned	0.29*** (0.09)	0.38*** (0.10)	0.30*** (0.10)	0.27*** (0.10)	0.35*** (0.09)	0.16 (0.11)	0.28*** (0.10)
Closed-End Fund	0.26*** (0.08)		0.28*** (0.08)	0.26*** (0.09)	0.23** (0.09)	0.35*** (0.09)	0.24*** (0.09)
VC Age	0.00 (0.00)	-0.01** (0.01)	-0.01 (0.00)		-0.01 (0.01)	0.00 (0.01)	-0.01 (0.00)
Syndicate Size	0.02 (0.01)						
Fund Age		0.06* (0.03)					
Information		-0.06 (0.04)					
Fund Inflows		-2.E-05 (0.00)	-2.E-05 (0.00)				
VC Majority				0.21** (0.09)	0.17 (0.13)		
FAR						-0.01 (0.18)	
Balance Sheet Size						7.E-08 (0.00)	
Repeat Entrepreneur							-0.11 (0.09)
E-Expert				-0.01 (0.00)			-0.03 (0.09)
Finished Product	-0.04 (0.08)	-0.04 (0.08)	-0.05 (0.08)	-0.03 (0.08)	-0.07 (0.09)	-0.05 (0.09)	-0.07 (0.09)
High-tech Industries	0.20** (0.09)	0.08 (0.10)	0.18* (0.09)	0.18* (0.10)	0.16 (0.10)	0.22** (0.10)	0.17* (0.10)
Period 1	-0.15 (0.12)	-0.21 (0.15)	-0.19 (0.12)	-0.13 (0.12)	-0.04 (0.13)	-0.11 (0.13)	-0.09 (0.12)
Period 3	0.23*** (0.07)	0.22** (0.09)	0.28*** (0.08)	0.19*** (0.07)	0.18* (0.10)	0.27*** (0.08)	0.27* (0.07)
Obs. Probability	0.52	0.54	0.54	0.54	0.46	0.54	0.53
Pred. Probability	0.52	0.55	0.54	0.55	0.43	0.54	0.54
No of Obs.	283	270	300	299	175	216	259
Wald χ^2 /F-Test	85.19***	69.26***	96.20***	88.88***	56.86***	60.97***	79.31***
Pseudo R^2	0.2784	0.2597	0.2873	0.2966	0.2714	0.2615	0.2667

Notes: Probit regression with clustered standard errors at firm-level. Marginal effects are indicated. Standard errors clustered at firm level in parentheses. We use *, **, and *** to denote significance at the 10%, 5% and 1% levels (for a two-sided test), respectively. Dependent variable is the TAG-ALONG DUMMY that takes value one when this right is present. The variable ROUND indicates the round the investment is in. The PLANNED EXIT DUMMY indicates whether the VC has an expectation about which form his exit could take place. CLOSED-END FUND is a dummy for closed- vs open-end funds. SYNDICATE SIZE records the number of VCs financing the firm currently. VC MAJORITY is a dummy variable that takes value one when the VC attains a majority in the current round. US-VC is a dummy for a VC based in the US, UK or Ireland. FUND INFLOWS control for aggregate fund flows into the German VC market. INFORMATION finally measures the amount of public information available about the VC. FAR is the ration of fixed assets to the size of the balance sheet. FUND AGE looks at the distance (in years) between the last fund closing and investment in the current portfolio firm. VC AGE captures the year the VC founded his firm. BALANCE SHEET SIZE controls for the size of the firm's balance sheet. REPEAT ENTREPRENEUR controls whether any of the founders has been a CEO or owner of a firm before. E-EXPERT is a dummy that indicates whether the entrepreneur's human capital is important in the firm. It takes value one if it is high-tech firm, at least one founder has a research degree and there does not yet exist a finished product. The variable FINISHED PRODUCT indicates whether the firm has a product that can be sold. Also, we observe the year when the financing round is closed and define three time dummies. The dummy HIGH-TECH INDUSTRIES is a dummy variable that indicates whether the firm's industry is research intensive, that is whether it is a Biotech, IT/Telecoms or a Traditional High-Tech firm. PERIOD 1 takes value one if the financing round was closed during the early period of relatively low venture capital activity, namely before 1998, PERIOD 2 if it was closed during the boom, i.e. between 1998 and 2000 and PERIOD 3 if it was closed after 2000 - a period of relative decline and reorganization of the venture capital industry.

Table 12: The determinants of the use of all Exit Clauses

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	β	β	β	β	β	β	β	β
Round	0.40*** (0.10)			0.27** (0.11)	0.27** (0.11)	0.27** (0.11)	0.29*** (0.11)	0.32*** (0.10)
Exit Planned		1.44*** (0.18)		1.00*** (0.21)	1.01*** (0.21)	0.97*** (0.21)	0.97*** (0.22)	1.14*** (0.21)
Closed-End Fund			1.00*** (0.16)	0.75*** (0.18)	0.72*** (0.18)	0.65*** (0.18)	0.65*** (0.19)	0.58*** (0.18)
US-VC				0.00 (0.37)				
VC Age					-0.02* (0.01)	-0.02* (0.01)	-0.02* (0.01)	-0.02** (0.01)
Information						-0.07 (0.09)		
Finished Product				-0.20 (0.18)	-0.19 (0.18)	-0.24 (0.18)	-0.25 (0.18)	-0.23 (0.18)
High-tech Industries				0.51** (0.20)	0.50* (0.20)	0.53*** (0.20)	0.51** (0.21)	0.54*** (0.21)
Period 1				-0.38 (0.25)	-0.46* (0.26)	-0.27 (0.27)	-0.26 (0.27)	
Period 2								-0.30** (0.15)
Period 3				0.55*** (0.18)	0.54*** (0.18)	0.51*** (0.17)	0.49*** (0.18)	
No of Obs.	374	331	331	284	275	276	269	276
Wald χ^2 /F-Test	15.29***	65.99***	39.91***	144.63***	136.36***	125.65***	124.82***	105.52***
Pseudo R^2	0.0324	0.1281	0.0680	0.2197	0.2196	0.2121	0.2124	0.1998

Notes: Ordered probit regression with clustered standard errors at firm-level. Marginal effects are indicated. Standard errors clustered at firm level in parentheses. We use *, **, and *** to denote significance at the 10%, 5% and 1% levels (for a two-sided test), respectively. Dependent variable is the EXIT RIGHTS dummy. The EXIT RIGHTS dummy is the sum of the sale rights found in the sample, that is the sum of the VC's preemption right dummy, as well as the drag and take-along dummies. The variable ROUND indicates the round the investment is in. The PLANNED EXIT DUMMY indicates whether the VC has an expectation about which form his exit could take place. In order to capture the differences between the VC types in more detail, we additionally include CLOSED-END FUND and INFORMATION. CLOSED-END FUND is a dummy for closed- vs open-end funds. INFORMATION finally measures the amount of public information available about the VC. The variable FINISHED PRODUCT indicates whether the firm has a product that can be sold. Also, we observe the year when the financing round is closed and define three time dummies. The dummy HIGH-TECH INDUSTRIES is a dummy variable that indicates whether the firm's industry is research intensive, that is whether it is a Biotech, IT/Telecoms or a Traditional High-Tech firm. PERIOD 1 takes value one if the financing round was closed during the early period of relatively low venture capital activity, namely before 1998, PERIOD 2 if it was closed during the boom, i.e. between 1998 and 2000 and PERIOD 3 if it was closed after 2000 - a period of relative decline and reorganization of the venture capital industry.

Table 13: The determinants of the use of all Exit Clauses

	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15
	β	β	β	β	β	β	β
Round	0.26** (0.11)	0.27** (0.11)	0.26** (0.11)	0.21* (0.11)		0.30 (0.13)**	0.24** (0.11)
Exit Planned	0.98*** (0.22)	1.15*** (0.23)	0.98*** (0.21)	0.91*** (0.21)	1.02*** (0.24)	0.65 (0.24)***	0.85*** (0.22)
Closed-End Fund	0.58*** (0.18)		0.64*** (0.18)	0.57*** (0.18)	0.53*** (0.20)	0.73 (0.20)***	0.59*** (0.18)
VC Age	-0.02 (0.01)	-0.02** (0.01)	-0.02* (0.01)	-0.02** (0.01)	-0.02 (0.01)	-0.01 (0.01)	-0.02*** (0.01)
Syndicate Size	0.03 (0.03)						
Fund Age		0.14 (0.09)					
Information		-0.03 (0.10)					
Fund Inflows		-3.E-05 (0.00)	-3.E-05 (0.00)				
VC Majority				0.59** (0.25)	0.36 (0.37)		
FAR						-0.43 (0.45)	
Balance Sheet Size						2.E-07 (0.00)	
Repeat Entrepreneur							0.02 (0.20)
E-Expert							0.06 (0.21)
Finished Product	-0.22 (0.18)	-0.21 (0.18)	-0.24 (0.18)	-0.20 (0.18)	-0.23 (0.19)	-0.21 (0.21)	-0.19 (0.19)
High-tech Industries	0.55*** (0.21)	0.27 (0.21)	0.52** (0.20)	0.48** (0.20)	0.36 (0.23)	0.62 (0.23)***	0.56*** (0.21)
Period 1	-0.21 (0.29)	-0.35 (0.35)	-0.39 (0.30)	-0.22 (0.27)	-0.07 (0.29)	-0.02 (0.28)	-0.27 (0.30)
Period 3	0.48*** (0.17)	0.54*** (0.22)	0.64*** (0.22)	0.42** (0.18)	0.43* (0.23)	0.73 (0.20)***	0.59*** (0.19)
No of Obs.	258	249	274	272	155	195	236
Wald χ^2 /F-Test	115.04***	82.00***	122.17***	115.00***	57.10***	97.11***	104.58***
Pseudo R^2	0.2012	0.1820	0.2128	0.2225	0.1804	0.1945	0.2026

Notes: Ordered probit regression with clustered standard errors at firm-level. Standard errors clustered at firm level in parentheses. We use *, **, and *** to denote significance at the 10%, 5% and 1% levels (for a two-sided test), respectively. Dependent variable is the EXIT RIGHTS dummy. The EXIT RIGHTS dummy is the sum of the sale rights found in the sample, that is the sum of the VC's preemption right dummy, as well as the drag and take-along dummies. The variable ROUND indicates the round the investment is in. The PLANNED EXIT DUMMY indicates whether the VC has an expectation about which form his exit could take place. CLOSED-END FUND is a dummy for closed- vs open-end funds. SYNDICATE SIZE records the number of VCs financing the firm currently. VC MAJORITY is a dummy variable that takes value one when the VC attains a majority in the current round. US-VC is a dummy for a VC based in the US, UK or Ireland. FUND INFLOWS control for aggregate fund flows into the German VC market. INFORMATION finally measures the amount of public information available about the VC. FAR is the ration of fixed assets to the size of the balance sheet. FUND AGE looks at the distance (in years) between the last fund closing and investment in the current portfolio firm. VC AGE captures the year the VC founded his firm. BALANCE SHEET SIZE controls for the size of the firm's balance sheet. REPEAT ENTREPRENEUR controls whether any of the founders has been a CEO or owner of a firm before. E-EXPERT is a dummy that indicates whether the entrepreneur's human capital is important in the firm. It takes value one if it is high-tech firm, at least one founder has a research degree and there does not yet exist a finished product. The variable FINISHED PRODUCT indicates whether the firm has a product that can be sold. Also, we observe the year when the financing round is closed and define three time dummies. The dummy HIGH-TECH INDUSTRIES is a dummy variable that indicates whether the firm's industry is research intensive, that is whether it is a Biotech, IT/Telecoms or a Traditional High-Tech firm. PERIOD 1 takes value one if the financing round was closed during the early period of relatively low venture capital activity, namely before 1998, PERIOD 2 if it was closed during the boom, i.e. between 1998 and 2000 and PERIOD 3 if it was closed after 2000 - a period of relative decline and reorganization of the venture capital industry.

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