

**THE CHOICE OF IPO VERSUS TAKEOVER:  
PRIVATE INVESTORS AND EMPIRICAL EVIDENCE\***

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**May 2003**

\* Earlier drafts of this work were distributed under different titles. I owe special thanks to the investors for providing the data, and to Jan Peter Kooiman, Enrico Perotti, Ibolya Schindele, and Robert Westenberg for their helpful support. I received helpful comments and suggestions from Patrick Bolton and Josh Lerner, and the seminar participants at the Aarhus Business School (March 2002), Copenhagen Business School (March 2002), the ABN AMRO Bank Conference on Private Equity Exit Strategies, Amsterdam (March 2002), the University of Alberta (April 2002), the American Finance Association Annual Conference, Washington DC (January 2003), University of Amsterdam (January 2003), Cambridge University Judge Institute of Management (January 2003), Center for Financial Studies, Frankfurt (January 2003), the University of Münster (January 2003), and the University of Manitoba (February 2003). Collection of the data was made possible with the generous assistance of the ABN AMRO Bank Corporate Finance Department, the University of Amsterdam Department of Financial Management, and a University of Alberta Pearson Fellowship. Any errors and/or omissions are my own.

# **THE CHOICE OF IPO VERSUS TAKEOVER: PRIVATE INVESTORS AND EMPIRICAL EVIDENCE**

## **Abstract**

We study the effect of private investor contractual governance on the likelihood of an entrepreneurial firm going public versus being acquired. On one hand, we may expect that the use of strong investor control contracts improves entrepreneurial firm governance and increases the probability of going public. On the other hand, we may expect that founding entrepreneurs generally prefer to maintain their position as CEO, and that the use of strong investor control contracts, which enables actual or constructive replacement of the founding entrepreneur as CEO, increases the probability of a takeover. These competing propositions are tested with a new sample of detailed European IPO and takeover transactions. The empirics indicate takeovers are more likely with strong private investor control contracts. Consistent with recent developments in the literature on capital structure and signaling, that data also indicate IPOs are more likely with private investor common equity contracts.

## I. Introduction

In their important paper, Brau, Francis and Kohers (2003) consider the interesting question: *why do some entrepreneurial firms go public while others get acquired?* Building on prior research, Brau *et al.* (2003) empirically demonstrate that the choice between an IPO and takeover is related to four primary categories of factors: (1) industry characteristics (see also Mitchell and Mulherin (1996), Pagano *et al.* (1998), Maksimovic and Pichler (2001), Stoughton *et al.* (2001)), (2) market timing (see also Ritter (1984), Delong *et al.* (1990), Golbe and White (1993), and Rajan and Servaes (1997), Bradley *et al.* (2003), Ljungqvist (2003)), (3) demand for funds by private firms (see also Mikkelsen *et al.* (1997) and Lowry (2000)), and (4) deal specific factors such as firm size, insider ownership and liquidity.<sup>1</sup>

This paper adds a new dimension to the analysis of IPOs versus takeovers by analyzing the role of the entrepreneurial firm's earlier stage investors. Why would we expect an entrepreneurial firm's earlier stage investors to influence the choice between an IPO and takeover? At a general level, early stage private investors may have a dual function in effecting an IPO or takeover outcome: (1) they provide value-added advice to entrepreneurs which could enable the company to better operate as a stand-alone firm with a stock exchange listing, and (2) they mitigate informational asymmetries between the entrepreneurial firm and its new owner(s) (shareholders in the case of an IPO and a larger company in the case of a takeover). This paper introduces a new dataset and provides empirical evidence that is highly consistent with this view that entrepreneurs' early stage investors have a non-trivial financial intermediation role in the IPO versus takeover decision.

Our analysis focuses on the contractual governance between entrepreneurs and their early stage investors. Consider the following tradeoff. On one hand, private equity investors are regarded as strong monitors of entrepreneurs, and provide value-added advice to entrepreneurial firms (Gompers and Lerner (1999)); therefore, it is possible that entrepreneurial firms that are monitored more closely through strong investor control contracts are more likely to be able to operate as a stand-alone public corporation listed on a stock exchange. On the other hand, early stage private investors could use strong control contracts to force entrepreneurs to accept takeover offers when entrepreneurs would otherwise prefer to remain on board as the CEO of a publicly traded company (e.g., due to non-pecuniary benefits, such as pride, etc.; see Black and Gilson (1998); Petty *et al.* (1999)). This is particularly true if the private investor has the right to replace the entrepreneur as CEO. As such, we expect strong private investor control to be associated with a higher

probability of a takeover. These competing predictions with respect to the effect of early stage investor contractual governance on IPOs versus takeovers have not been the subject of prior empirical analysis.

Private investor governance may also play a signaling role in the IPO versus takeover question. Recent research is consistent with the conjecture that weak investor control contracts among private investors that have superior information than entrepreneurs facilitate a favorable quality signal to public investors. That is, if the private investor employs a weak contract with few control rights and securities without downside protection, the subsequent purchasers of the firm (e.g., public shareholders in the case of an IPO) may view the lack of need of strong private investor contractual governance as a favorable signal of entrepreneurial firm quality. The value of this type of signal would be markedly different for IPOs and takeovers, since new owners in an IPO face significantly greater difficulties in resolving information asymmetries relative to the new owners in a takeover (see references in note 1). As such, weak private equity contractual governance through the use of common equity and few veto and control rights could increase the probability of a going public transaction, which is consistent with recent theoretical work on signaling and capital structure.<sup>2</sup>

Although we introduce a new dimension to the analysis of IPOs versus takeovers, we stress that our approach and analysis complements the largely seminal work of Brau, Francis and Kohers (2003), and is in no way to the exclusion of their research and/or results. Brau *et al.* consider an industry-wide sample of U.S. IPOs and takeovers, many of which would not have received backing from a private investor of the type considered in this paper. Our analysis is based on a hand-collected sample of European private investor contracts.<sup>3</sup> Our analysis focuses on private investor governance and firm-specific factors, whereas Brau *et al.* study industry, market, demand and deal-specific factors enumerated above (see note 1 and accompanying text). As stated by Brau *et al.* (2003; at note 2): “Whereas an examination of firm-specific factors is certainly of interest, the severe lack of available data on private firms would significantly reduce our sample and compromise the ability to identify the external factors that are thought to influence this choice [between IPOs and takeovers]”. Our paper complements Brau *et al.*’s analysis by focusing on certain firm-specific factors to which they refer.

This paper introduces a new hand-collected dataset of IPO and takeover transactions (collectively we may refer to these as “dispositions” or “exits”) that span the years 1996 – 2003 and a number of European countries (including Germany, the Czech Republic, The Netherlands, Switzerland, Italy, Denmark, France, Belgium, Poland, Austria and Portugal). The data were derived from a survey of European private investors in 2002. The data comprise very detailed information on 223 investments; of these investments, there are 50 actual dispositions that had already occurred, 80 dispositions expected to occur in 2003 or 2004, and 93

investments that have not been exited (and exits were not expected in the immediate future at the time of data collection). That exited and non-exited investments exist in this database is useful as it enables empirical consideration of selection effects in the examination of going public versus takeover sale transactions. We also provide evidence on liquidations. In ascertaining the role of private investor contractual governance on the path to a going public or takeover transaction, we control for a number of potentially relevant factors, including (1) investor characteristics (capital under management, limited partnership or corporate fund), (2) entrepreneurial firm characteristics (industry, stage of development at time of private investor investment), (3) transaction-specific characteristics (duration of private investment, capital structure, veto and control rights, ownership percentages, syndication, boards of directors, etc.), (4) market sentiment (returns to the Morgan Stanley Capital International (MSCI) index), and (5) legality, among other control factors.

The central findings in this paper support the conjecture that strong private investor contractual governance increases the probability of takeover outcomes, and weak private investor governance increases the probability of IPO outcomes. Most notably, when the private investor uses common equity (which is associated with weak contractual governance terms, as opposed to convertible debt or convertible preferred equity, which is associated with more investor veto and control rights) to finance the entrepreneurial firm, the likelihood of an IPO increases by approximately 30%. This is consistent with Garmaise's (2000) model that common equity can facilitate a favorable quality signal for new ventures. We also provide results that show private investors make use stronger contractual governance mechanisms to force takeover sales when entrepreneurs would otherwise prefer IPOs. These results are robust to numerous specifications explicitly provided herein, including alternative control variables, binomial/multinomial logit specifications accounting for collinearity, heteroskedasticity, endogeneity, as well as statistical selection effects.

This paper is organized as follows. Section II discusses prior research and hypotheses. Section III presents the data. Empirical tests of the base model are provided in section IV. Section V presents additional robustness checks on the base model. Limitations, alternative explanations and avenues for future research are discussed in section VI. The last section concludes.

## **II. IPOs versus Takeovers: Theory and Hypotheses**

In this section we group the factors that affect the choice between an IPO and takeover for a private investor-backed entrepreneurial company into four categories: (A) the characteristics of the private investor, (B) the characteristics of the private investor, (C) the contractual governance relationship between the private investor and the entrepreneurial firm, and (D) market and regulatory factors. Each is discussed in turn.

### *A. Private Investor Characteristics*

The fundamental premise in this paper is that a private investor can act as a financial intermediary between the entrepreneurial firm and the new owners (public shareholders in the event of an IPO, and the acquiring firm in the event of a takeover). The private investor can facilitate two primary roles: (1) add value through active assistance provided to the entrepreneurial firm (Gompers and Lerner (1999)), and (2) certify the quality of the entrepreneurial firm (Barry *et al.* (1990), Megginson and Weiss (1991), Lerner (1994), Gompers and Lerner (1999), Francis and Hasan (2001)) so that information asymmetries between the entrepreneurial firm and the new owners are lower than that which they otherwise would have been at the time of exit. Through both roles, the sale price of the entrepreneurial firm is higher by virtue of the presence of the private investor.

The certification role of a private investor differs for an IPO and takeover because the new owners in an IPO (public shareholders) are different than the new owners in a takeover (generally, a large corporation). We may conjecture (based on cites listed in note 1 and accompanying text) that a large company acquiring the entrepreneurial firm is better able to resolve information problems and monitor the entrepreneurial firm relative to a group of disparate shareholders in the case of an initial public offering. Information asymmetries matter to a significant degree in sale transactions as they inversely correlated with the sale price. In the case of an IPO, for example, greater the information asymmetries (all else being equal) are associated with more underpricing (see note 1). As such, the roles played by a private investor, particularly the role in certifying quality, matters to a much greater degree for IPOs than it does for takeovers. All else being equal, the greater the certification effect provided by the private investor, the greater the probability of an IPO relative to a takeover because the cost of an IPO will be lower (Megginson and Weiss (1991)).

Both the value-added and certification roles of a private investor depend on private investor characteristics. In our empirical analysis we control for the type of private investor fund (limited partnership or otherwise (corporate-affiliated)). Prior research is consistent with the proposition that limited partnerships provide greater value-added and quality certification relative to other private investors (Gompers and Lerner (1999)). Similarly, we control for the capital under management per manager and the size of the portfolio (the number of entrepreneurial firms in the private investor portfolio per manager). Higher quality investors typically attract more capital for investment. Funds with a greater number of entrepreneurial firms in the portfolio per manager, however, naturally dilute the value-added advice they can provide to each entrepreneur (Kanniainen and Keuschnigg (2003)). Further, we control for the duration of private investment: longer

private investor backing enhances certification (as discussed by Megginson and Weiss (1991) in the context of IPO underpricing). We also control for investor governance variables discussed in part C below.

### *B. Entrepreneurial Firm Characteristics*

As discussed by Brau *et al.* (2003), a number of different entrepreneurial firm characteristics can affect the choice of IPO versus takeover.<sup>4</sup> Examples include the firm's stage of development, assets, and the primary industry in which it operates. Generally, these characteristics affect a firm's asset intangibility and the ability of the new owners to value the entrepreneur's technology and monitor the firm. All else being equal, the cost of an IPO is lower when a firm's information problems attributable to its own characteristics are less pronounced. Younger firms without a track record in high-tech industries have more pronounced information problems; therefore, all else being equal, smaller high-tech firms face greater costs associated with going public than being taken over (see references in note 1). Industry characteristics can also be related to transaction synergies, which could favor takeovers relative to IPOs for certain high-tech firms. (In section D, we note that market conditions obviously also play a significant role.) In addition, because IPOs and takeovers may generate different proceeds in the sale of the firm, an entrepreneurial firm's growth potential and capital needs may also be relevant for the choice between an IPO and takeover.

### *C. Private Investor – Entrepreneurial Firm Governance Relationship*

Contractual governance between a private investor and an entrepreneur exists on a variety of dimensions: capital structure (security design), veto and control rights (such as the right to replace the founding entrepreneur as CEO, co-sale agreements, and veto rights over asset sales/purchases and issuances of equity), ownership and voting percentages, and board seats. Our hand-collected dataset comprises information on all of these factors. In theory, it is natural to expect the allocation of control and decision rights between an investor and entrepreneur to affect the choice between an IPO and takeover (Aghion and Bolton (1992), Yosha (1995), Zingales (1995)).

The issue of entrepreneurial firm governance is complicated by the fact that private investor financial contracts have a multidimensional element. First, consider the issue of how security design (the allocation of cash flow rights) between the private and public investor impacts the decision between an IPO and a takeover. Security design (together with ownership percentages) can (1) mitigate agency problems between the investor and entrepreneur (bilateral and/or trilateral moral hazard problems), and (2) facilitate quality (or the absence thereof) signals to the new owners. There is a tradeoff between these two factors. On one hand, prior

theoretical research has established that convertible securities optimally mitigate agency problems in venture finance (Berglof (1994), Casmatta (2003)). As such, those securities should be associated with lower moral hazard problems, higher valuations, and a greater probability of an IPO. On the other hand, security design can signal information to the new owners upon exit. Myers and Majluf (1984) show when entrepreneurs have information that is superior to investors, common equity is a signal of low quality (see also Leland and Pyle (1977)), whereas Garmaise (2000) shows that when investors have superior information to entrepreneurs (and/or superior skills in valuation, etc., as in the case of specialized private equity investors), common equity can operate as a signal of favorable information about the firm. Relatedly, securities that provide the private investor with downside protection signal to the new owners that there was a pronounced concern with priority in bankruptcy at the time of the investment, unlike investments financed by common equity. In net, the use of common equity poses a tradeoff: (a potentially) favorable signaling upon disposition to the new owners (as in Garmaise's (2000) theory) versus potentially higher expected moral hazard costs over the period of investment (as in Berglof (1994), Casmatta (2003)). A priori, it is not possible to ascertain the empirical significance of either of these effects. We provide a first-ever test this tradeoff in the empirics.

Second, consider the allocation of control rights, which can be allocated independently of cash flow rights. Private investors typically take a significant amount of control in financing entrepreneurial firms through the use of veto rights, control rights, voting rights, and board seats. Entrepreneur / private investor conflicts may arise in the choice between IPO and takeover. In a takeover, the founding entrepreneur is typically ousted as the CEO of the company; whereas in an IPO, the founding entrepreneur regains control over the firm from the private investor(s) (Black and Gilson (1998)). Entrepreneurs may therefore have private incentives to go public (e.g., non-pecuniary benefits to being CEO of a publicly traded company) even though the value-maximizing decision is in fact to exit through a takeover (see also Petty *et al.* (1999) for supportive case studies). If so, strong private investor contractual governance would be associated with an increase in the probability of takeovers. We therefore control for the extent to which private investors have control over the exit decision in the empirical analysis.

#### *D. Market and Regulatory Factors*

In the empirics we include variables that account for the fact that markets, especially IPO markets, are subject to swings (see, e.g., Brau *et al.* (2003), Bradley *et al.* (2003), and other sources cited in note 1 and accompanying text). For example, we control for the returns in the public market (with the country-specific Morgan Stanley Capital International (MSCI) data) over the period of the private equity investment (as well as other possibly relevant periods), as well as exit year dummy variables discussed below.

We also control for country legality (using the Legality index defined in Berkowitz *et al.* (2003)). We may expect that countries with stronger investor protection have a greater likelihood of IPO exits relative to takeovers (La Porta *et al.* (1998), etc.). All else being equal, legal certainty and investor protection is more valuable in the context of an IPO because information asymmetry is more pronounced for a disparate group of new shareholders in an IPO relative to the new owners in a takeover, and therefore the cost of going public (e.g., in terms of underpricing) is lower the greater the legal certainty and protection. More generally, for certain countries with lower Legality measures, the domestic stock exchange may be less reputable which also increases the cost of going public.<sup>5</sup>

### *E. Summary*

As discussed by Brau *et al.* (2003), it is possible to conjecture many factors that influence the IPO/takeover decision, and their relevance cannot be resolved without empirical scrutiny. We control for a variety of factors listed above, among others discussed further below. The central theme in this section was to point out a potential role for private investors in an entrepreneurial firm's IPO or takeover outcome, particularly with respect to contractual governance and signaling. The following section of this paper introduces a new dataset to consider whether or not private investors are in fact statistically and economically relevant financial intermediaries between entrepreneurial firms and their new owners in IPOs versus takeovers.

## **III. Data**

### *A. Sample Selection*

The data comprise 223 entrepreneurial firms and were hand-collected from 35 private equity funds in 11 European countries: Germany (50 entrepreneurial firms), The Czech Republic (5 entrepreneurial firms), The Netherlands (73 firms), Switzerland (15 firms), Italy (23 firms), Denmark (11 firms), France (6 firms), Belgium (8 firms), Poland (12 firms), Austria (10 firms) and Portugal (6 firms). The private investors financed these firms between 1995 and 2002. The actual IPO, takeover and liquidation decisions spanned the years 1996-2003. We also include in the data dispositions that were expected (by the private investor) to occur (as at January 2003) in either 2003 and 2004. In total, there are 15 actual IPOs, 24 actual takeovers, 14 actual liquidations, 23 expected IPOs, 48 expected acquisitions, and 6 expected liquidations. For 93 of the

investments in the sample, exit not yet occurred and was not expected (as at January 2003) in either 2003 or 2004.

The objective of the analysis is to focus on contractual governance between private investors and entrepreneurial firms, and test how this governance affects the choice between an IPO and takeover. The information collected is strictly confidential, and not publicly available. Data were disclosed on a completely voluntary basis. Given the type of confidential information collected, naturally we cannot refer to an aggregate industry database for comparison. Nevertheless, we can point out that our sample is similar to prior datasets on private equity exits in terms of the frequency of IPOs, takeovers and liquidations. Cochrane (2001) provides similar information on the US market (albeit that data does not detail information about contractual governance). The frequency of IPOs relative to takeovers is also similar to Brau *et al.*'s (2003) US industry-wide dataset. Gompers (1998), Kaplan and Stromberg (2000) and Schwienbacher (2002) provide similar information on hand-collected private equity datasets in the US and Europe (the scope of those datasets is also very similar to our own, in terms of details and number of observations), and the frequency of use of particular contracts is similar to that reported in this study, accounting for institutional differences between the U.S. and Europe.<sup>6</sup>

We do note that the dataset introduced in this paper is the first of its kind: to our knowledge, no prior dataset matches investment-specific details pertaining to private investor contractual governance over entrepreneurial firms with IPOs and takeovers outcomes.<sup>7</sup> As such, we cannot be 100% confident about representativeness. The frequency of IPOs, takeovers and liquidations by year and industry are also presented in Figures 1a and 1b. As the data were hand-collected through the use of surveys and interviews, the data are more heavily concentrated in periods closer to January 2003. In the empirical analysis, we check for non-randomness in sample selection by considering a number of different types of selection regressions (Heckman, 1976, 1979, etc.). We explicitly show that the primary results are not biased by sample selection (to the extent that statistical selection control methods can be used on the data).

[Figures 1a,b About Here]

### *B. Summary of the Data*

The data are summarized in Table I. Table I presents the data by (column 1) the full sample, (2) actual IPOs, (3) actual takeovers, (5) actual liquidations, (6) actual and expected IPOs, (7) actual and expected takeovers, (9) actual and expected liquidations, and (10) investments for which an actual or expected exit has

not yet come to pass. Column (4) presented comparison tests (of means or proportions, as applicable) for columns (2) versus (3). Column (8) presents similar tests comparing columns (6) and (7).

[Table I About Here]

The summary statistics and comparison tests in Table 1 provide a number of initial insights into the role of private investors in IPOs versus takeovers. Most notably, the data indicate private investors that financed the entrepreneurial firm with common equity backed a greater proportion of the IPOs, and private investors that employed a greater number of control and veto rights (alongside the use of convertible securities) financed a greater proportion of takeovers. These differences are statistically significant (at the 5% level, and in some cases at the 1% level, as indicated in Table I) for both the subsample of actual exits, as well as the larger sample of actual and expected exits. The summary statistics for the actual and expected exits also indicate that greater private investor board representation is associated with more frequent takeovers. In sum, the summary statistics consistently support the conjecture (section II.C) that common equity facilitates a signal of quality that is relevant in the context of an IPO, whereas strong private investor contractual governance can be used to effect a takeover (presumably, when an entrepreneur might otherwise prefer an IPO to derive non-pecuniary benefits).

It is also noteworthy that a greater proportion of IPOs are derived from limited partnerships, and by private investors with more capital under management. The IPOs tended to have a greater number of syndicated investors. IPOs tended to be financed for a greater number of months prior to disposition, relative to takeovers. While these particular comparison tests are not statistically significant, they are generally consistent with the US evidence on venture-backed IPOs and the differences between limited partnerships and corporate venture capitalists reported by Gompers and Lerer (1999) (see also Barry *et al.* (1990), and Megginson and Weiss (1991)). Similarly, it is noteworthy that the liquidations tended to be more frequent among private investors that had less capital under management. For the actual exits, there were a couple of takeovers that generated very large capital gains and higher market values than the IPOs upon sale.

A correlation matrix of various variables is presented in Table II, Panel A. This matrix is generated for the subsample of the data for both actual and expected exits, including IPOs, takeovers and liquidations (130 entrepreneurial firms in total). As well, in Panel B we provide correlations across country-specific dummy variables (note, however, that the country dummies may reflect fund-specific factors, as there are not many funds in the data for each of the specific countries). Correlation matrices for other subsets of the data

are available upon request (for succinctness, we do not present other matrices; the inferences from others are not materially different).

[Table II, Panels A and B About Here]

An issue worth pointing out in the summary of the data is the correlations between certain transaction-specific characteristics. For example, common equity tends to be associated with fewer veto rights and control rights, whereas majority investor ownership (ownership percentage was perfectly correlated with voting percentage) is associated with more control. These statistics are consistent with prior theories.<sup>8</sup>

The data also comprise other details on the nature of the financing transactions and exits. The additional details are excluded for succinctness, and because the additional information was immaterial to the analysis herein. For example, in this dataset, the vast majority of the sales were cash transactions (not shares), which makes the analysis of the method of payment somewhat uninteresting in this dataset.<sup>9</sup> Brau *et al.* (2003), for example, find more frequent use of share transactions, and consider that issue (among others, in the spirit of Leland and Pyle (1977)) in detail.

Note that although the central issue is on IPOs versus takeovers, we report and make use of other data to control for sample selection issues in the spirit of Heckman (1976, 1979). The multivariate empirical analyses are presented below. The first set of empirical tests in section IV considers a “base model”. The base model is compared to a large number of alternative specifications in section V to check for robustness to a number of assumptions that underlie alternative empirical specifications. Limitations are thereafter discussed in section VI.

#### **IV. Base Model Estimates**

The propositions discussed in section II are first tested in this section with the specification presented in Table IV. Numerous robustness checks are provided in the next section. The base model is a multinomial logit model in which the dependent variable can take three possible values: IPO, takeover, or liquidation. The independent variables include dummies variables equal to one for limited partnership private investors, common equity financed entrepreneurial firms, private investor contracts in which the investor has the right to replace the founding entrepreneur as CEO, contracts in which the private investor(s) has a majority ownership percentage (including syndicated investors), and a dummy for entrepreneurial firms in high-tech industries (e.g., communications/internet, medical/biotech, and electronics/computers). The independent variables also

include a variable for the number of contractual contingencies (allocated independently of the security<sup>10</sup>), the number of syndicated investors, the log of the book value of private investment, and the country-specific MSCI return over the period of private equity investment.<sup>11</sup> Many of the other variables are excluded in this base model due to issues associated with collinearity (see also Table II), endogeneity, etc., but are considered in section V.

The base model estimates are presented in Table III. Note that multinomial logit coefficient estimates are not presented; rather, the marginal effects derived from the coefficients are presented to explicitly illustrate economic significance alongside statistical significance. The marginal effects indicate the increase (decrease) in the probability of IPO, takeover or liquidation that is attributable to the particular right-hand-side variable. Three specifications are presented in Table III to illustrate robustness. Panel A of Table III reports the data with only actual exits; Panel B incorporates both actual and expected exits. In the next section, we consider alternative variables and alternative econometric specifications. At the bottom of each of the tables, goodness-of-fit measures are provided, such as the match between actual and predicted outcomes. Most of the regressions provide reasonably accurate predictions.

[Table III About Here]

Model (1) in Table III excludes all right-hand-side variables except the common equity dummy variable. The results indicate that IPOs are 30% more likely in Panel A (actual exits) and 31% more likely in Panel B (actual and expected exits). There is no material effect in the likelihood of actual or expected takeovers and liquidations associated with common equity contracts. The evidence is consistent with the signaling theory discussed in section II (as per Garmaise (2000)).<sup>12</sup>

Model (2) in Table III is similar to Model (1), but adds in a few extra right-hand-side variables. The economic significance of the common equity dummy variable is slightly lower (but still indicates at least a 25% increase in the probability of an IPO when common equity is used). As well, it is noteworthy that limited partnership investors are 52% more likely to back companies that go public (but this is significant in Panel A only, for the subsample excluding expected exits). When the private investor has the right to replace the CEO, IPOs are 31% less likely (Panel A; 20% less likely in Panel B with expected exits in the data).

The Model (2) regressions results further indicate that larger investments (larger book values) are likely to be IPOs and smaller investments are likely to result in liquidations. Numerous private investor managers (and investment bankers) interviewed indicated that a minimum capitalization was required to be

able to effect an IPO. Smaller investments tended to be in younger more risky firms, and more often results in liquidations.<sup>13</sup> Similarly, investments over periods with increasing MSCI returns were more likely to result in IPOs, and investments in declining market periods were more likely to result in liquidations. These results are all significant at the 5% level in Panel A (for obvious reasons, in Panel B which includes expected exits in the considered dataset, these variables are less significant or insignificant).

It is noteworthy that in Panel B, a dummy variable is used for expected exits (equal to 1 when the observation was an expected exit, and zero for an actual exit). The regressions indicate that liquidations are less likely for the expected exits variable, which is consistent with over-optimism that has been widely documented in entrepreneurial finance (see, e.g., Allan and Gale (1999), Landlier and Thesmar (2003)).

Model (3) presents a similar specification with a relatively more complete set of variables. The evidence further shows the robustness of the use of common equity and IPO exits, as well as the significance of the other variables in Model (2) discussed above. The additional variables considered are not significant determinants of the exit outcome, but are nevertheless presented to show robustness. Further robustness checks are provided in the next section.

## **V. Robustness Checks, and Complementary Analyses**

The robustness checks in this section are presented as follows: section A considers binomial logit estimates; section B considers endogeneity and additional right-hand-side variables; section C considers sample selection effects in exit outcomes; section D considers selection effects in the measurement of realized returns. Section VI discusses additional robustness checks, limitations and alternative explanations.

### *A. Binomial Logit Estimates*

This section presents binomial logit estimates of IPOs versus takeovers. Liquidations and non-exited investments are excluded from the data. Three models are presented for both the samples including actual exits (only), and actual and expected exits together. The regressions are presented in Table IV.

[Table IV About Here]

The regression results are quite consistent with those reported in Table III. IPOs are more likely when the private investor used common equity in financing the entrepreneurial firm, when the private investor

was a limited partnership, and when the MSCI public market index was increasing over the period of private equity investment. Takeover exits are more likely when the private investor had the right to replace the founding entrepreneur as CEO.

Note that for Model (3) in Table IV we consider additional variables not considered in Table III (e.g., particular industry variables instead of one dummy for high-tech); however, these variables are insignificant. Greater problems of collinearity arise when these additional variables are employed, which tends to mitigate the significance of a couple of the other variables. The common equity and limited partnership dummy variables are quite robust to the inclusion/exclusion of these other additional variables.

### *B. Additional Variables and Endogeneity*

Table V presents regression results that are similar to Table IV. The difference in Table V is that additional variables are considered, and some of which are potentially endogenous. Instrumental variables are considered alongside the potentially endogenous variables, as explained below.

[Table V About Here]

The primary two additional variables that are considered include the market/book value of the entrepreneurial firm at the time of exit, and the total duration (number of months) of private equity investment. These variables are not necessarily endogenous to the IPO/takeover decision. As such, various instrumental variables are used that could explain those variables, including exit year dummy variables (as well as a number of the other variables reported in Table V.<sup>14</sup> Perfect instruments (correlated with duration and market/book but uncorrelated with exit choice) are not available; nevertheless, exit years seemed intuitive, as firms may have had an incentive to rush to market in boom periods, and valuations could have been higher in boom periods. The significance of the exit 2000 dummy variable in Table V confirmed this conjecture. (Exit year dummies were insignificant in the IPO/takeover exit outcome regressions.) As might have been expected with the time period considered, market/book valuations were higher for Internet/communications firms in the sample, and higher in 2003. In terms of the duration regression, various factors are significant. Notably, higher MSCI returns over the investment period are associated with a shorter duration, which suggests firms are rushed to market in rising market periods. Some of the exit year dummy variables are significant, as would be expected because the regression considers all investments (even those not exited), and the exit years cover those investments brought to fruition. Numerous other controls are used

in these regressions; regardless, the results for generating fitted values for market/book and duration in the Step 2 instrumental variable regressions are not materially affected by the choice of instruments.

In short, the step 2 instrumental variable regressions in Table V are quite consistent with the prior results reported in Tables III and IV. Regardless of the specification (reported and otherwise), common equity is associated with IPOs, the right to replace the founding entrepreneur as CEO is associated with takeovers, and larger investments and investments over periods of rising markets are associated with IPOs.

### *C. Selection Effects in Exits and Choice of IPO versus Takeovers*

In this section we consider the fact that an entrepreneurial firm does not need to consider either an IPO or takeover. We employ a two-step procedure that makes use of sample selection bias in the spirit of Heckman (1976, 1979). Wynand and van Praag's (1981) method for sample selection estimates with bivariate second step regressions is used in Table VI. This is possible by virtue of the fact that many of the firms in the sample have not been exited by either an IPO or a takeover. In the first step regressions, we consider the impact of the likelihood of a disposition, on the basis of changes in the MSCI index. As expected,<sup>15</sup> in periods of rising markets we find IPO and takeover exits are in fact more likely. In the second step, we show the impact of the variables discussed above on the likelihood of an IPO or takeover, given the non-randomness in the exit decision. The results are quite robust to consideration of this non-randomness, as the estimates are similar to those presented in the prior tables. In Table VI, IPOs are at least 30% more likely when common equity is used. Takeovers are at least 23% more likely when the private investor has the right to replace the founding entrepreneur as CEO. As well, note that these results are quite robust to alternative selection specifications (reported and otherwise available upon request). Based on this evidence, there is little concern that sample selection issues bias the primary estimates discussed above.

[Table VI About Here]

### *D. Selection Effects in the Estimates of Realized IRRs*

A matter of interest related to the analysis of IPO versus takeover is the impact of the private investor governance and other firm-specific factors on realized IRRs (for similar work with a larger sample of US industry data, see Brau *et al.* (2003, Table V)). Table VII presents 4 models: Models (1) and (2) do not consider sample selection; Models (3) and (4) present alternative specifications of the Heckman (1976, 1979) sample selection regression. Model (1) considers only actual IPOs and takeovers. Model (2) includes

liquidations (as well as a dummy variable to control for liquidations). Model (3) provides sample selection for the actual IPOs and takeovers. Model (4) provides sample selection for IPOs and takeovers, as well as liquidations.

[Tables VII About Here]

Table VII indicates higher returns for Internet/communications firms, and this results holds in each of the four alternative models. For Models (2) and (4), majority private investor ownership tends to be associated with lower returns. There is weak evidence (Model (4) in Table VII) that common equity investments are associated with higher returns. In short, we do not find a systematic premium over IPOs and takeovers in this sample of European transactions, but do find some differences in returns depending on the structure of the private investor transaction. This evidence on returns complements the earlier evidence on exit outcomes as it shows the importance of private investor contractual governance in this sample.

## **VI. Further Robustness Checks, Limitations, Alternative Explanations and Future Research**

We presented many robustness checks in sections IV and V for collinearity, endogeneity, and sample selection, among other things. Numerous alternative specifications were considered. For example, there are numerous alternative types of veto and control rights in the data. We employed the dummy for the right to replace the CEO, as it is generally regarded as the most meaningful private investor control right. Nevertheless, the results are generally consistent for different variable definitions, as different veto and control rights are frequently used in conjunction with one another (they are complements, not substitutes). For reasons of succinctness, we do not present other robustness checks (but any additional specifications are available upon request). We have controlled for a very large number of different firm-specific and private investor-specific characteristics. The information considered was hand-collected, and highly confidential. While we have no reason to believe our consideration of the variables in this paper is not comprehensive, it is possible that other factors could have been relevant, to the extent that private investors refused to disclose information. (Again, our controls for sample selection did not point to any pronounced concerns.)

One concern that was investigated was the issue of whether investor- or country-specific factors were an underlying cause of the use of certain contracts and certain exits. This concern was alleviated by the fact that each investor in each used a heterogeneous mix of different forms of finance and contractual clauses, and each investor in each country had actual or prospective IPO or takeovers for their entrepreneurial investees (see Table II, Panel B for country-specific correlations discussed above in subsection III.B; see also note 6).

Moreover, our interviews with and surveys of the investors indicated that institutional factors were not material for determining the use of different contractual governance mechanisms and exit outcomes (IPO, takeover or otherwise). In this dataset we controlled for country-specific factors with the Legality index, and various investor-specific factors (type of investor, syndication, etc.) Other possible variables (e.g., country-specific dummies, etc.) did not materially impact the results. However, with a larger sample of publicly available, possible extensions along the lines of exploring international differences could make use of publicly available data with macroeconomic variables, in the spirit of Brau *et al.*'s (2003) analysis of US evidence.

Whether or not private investor contracts have a role in the path to going public is a question that has a number of normative implications. Most notably, the analysis is indicative of efficient ways to structure private investor contracts to better facilitate subsequent going public transactions, and how other contractual structures facilitate private sale transactions. The analysis is also suggestive of further avenues of research on the role of private investor contractual governance in short- and long-term IPO performance, and the relation between public investors, investment banks and private investors. It would be worthwhile to hand-collect additional relevant data pertinent to those follow-up issues.

## **VII. Summary and Conclusions**

The results in this paper highlight the role of common equity in IPOs, and the private investor's right to replace the CEO in effecting takeovers. Common equity is a signal of quality (see, e.g., Garmaise (2000)) that is relatively more effective for disperse shareholders in IPOs. In contrast, strong control rights are useful to an investor for forcing a takeover of the entrepreneurial firm, particularly when the entrepreneur has private benefits to remaining on board and obtaining non-pecuniary benefits to being the CEO of a firm with public profile on a stock exchange (see also Black and Gilson (1998) for a consistent discussion-based theory, and supportive case studies in Petty *et al.* (1999)). Although the vast array of regressions presented in this paper showed some differences in economic significance, the results generally indicated IPOs are 30% more likely for common equity backed entrepreneurial firms, while takeovers are 25% more likely for entrepreneurial firms backed by investors with strong control rights (particularly, the right to replace the founding entrepreneur as CEO). We also showed exit itself is more likely in periods of rising markets, and controlled for sample selection effects. We further showed the results were quite robust to sample selection effects, among numerous other controls. Moreover, with and without sample selection controls, we found no premium for IPOs versus takeovers in the multivariate analysis of the European data. We did, however, find some evidence that private investor contractual governance has an effect on realized returns, which is consistent with the role of private investor governance on the choice between IPOs and takeovers.

At a more general level, the data highlight a role of private investors as financial intermediaries between the entrepreneurial firm and its new owner(s) in an IPO or takeover. Further theoretical work could examine more closely the role of private investor governance. Further empirical work could explore other types of private investors, as well as additional institutional differences and differences across countries.

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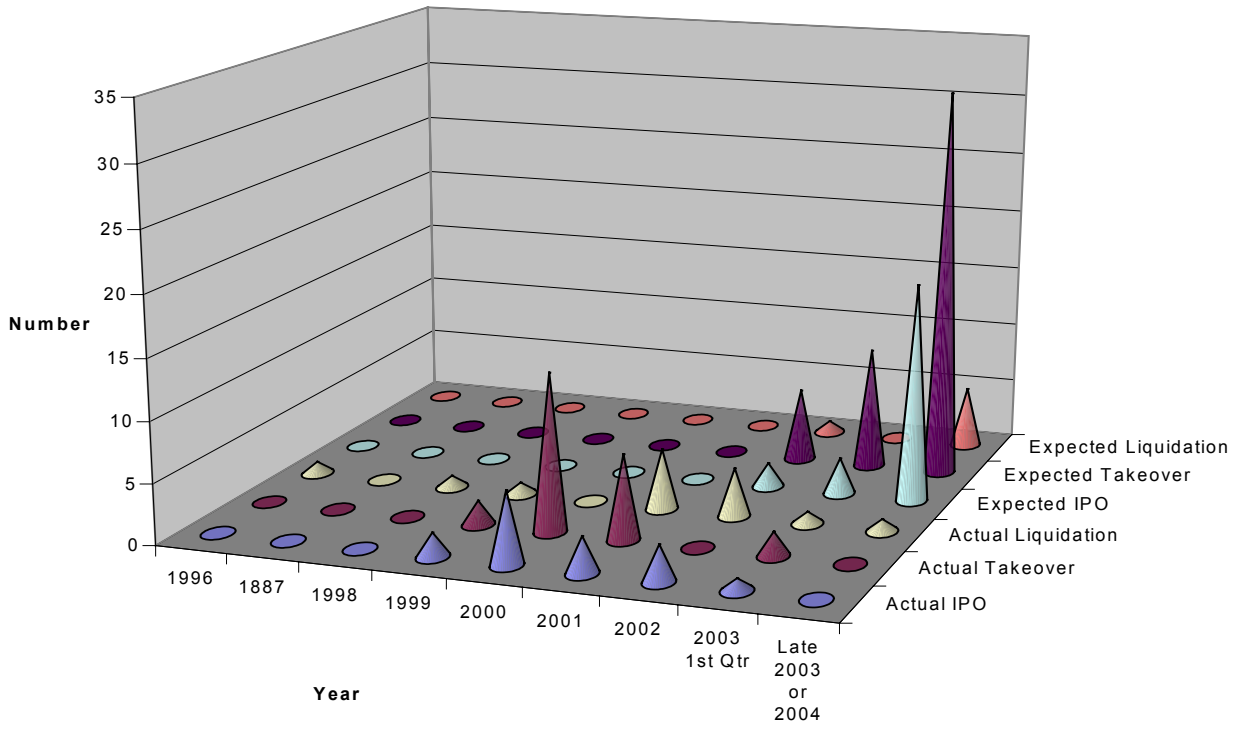
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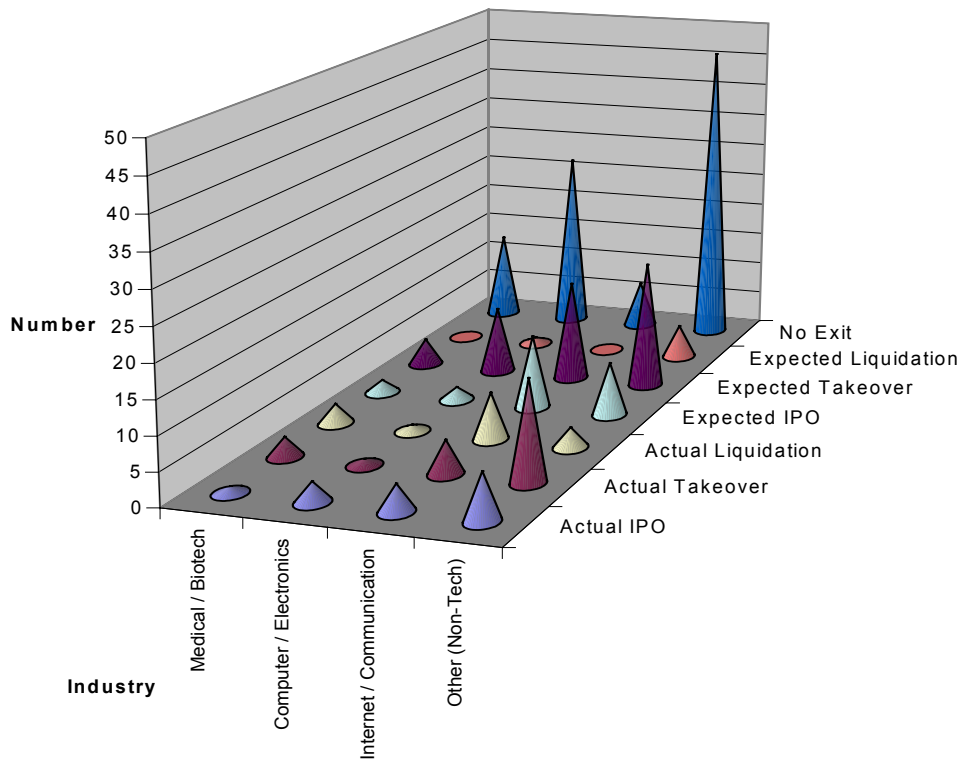
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**Figure 1. Frequency of IPOs and Takeovers by Year**



**Figure 2. Frequency of IPOs and Takeovers by Industry**



**Table I.**  
**Summary Statistics and Difference Tests Between IPOs and Takeovers, 1996 - 2004, Including Actual and Expected Exits**

	(1)	(2)	(3)	(4)	(5)
	Total Sample	Actual IPOs	Actual Takeovers	test of (2) versus (3)	Actual Liquidations
Total Number of Observations (# Entrepreneurial Firms)	223	15	24	-1.40	14
Proportion of Limited Partnership Investors	0.65	0.93	0.75	1.45	0.57
Proportion of Other Types of Investors	0.35	0.07	0.25	-1.15	0.43
Average Total Capital Managed by Investor ('000 Euros)	€ 713,322.83	€ 2,224,878.80	€ 1,635,666.67	1.16	€ 1,114,798.71
Average IRR	0.23	1.44	1.21	0.07	-0.79
Average Market / Book	2.01	5.22	7.05	0.00	0.00
Average Market Value ('000 Euros)	€ 24,461.60	€ 61,261.20	€ 140,284.00	-4.04***	€ 2.75
Average Book Value ('000 Euros)	€ 7,169.57	€ 15,259.80	€ 10,952.20	0.64	€ 3,928.24
Proportion of all types of High Tech Firms	0.54	0.53	0.38	0.91	0.79
Proportion of Biotech / Medical Firms	0.12	0.07	0.13	-0.58	0.21
Proportion of Computer / Electronics Firms	0.20	0.20	0.04	1.59	0.07
Proportion of Communications / Internet Firms	0.22	0.27	0.21	0.42	0.50
Proportion of Early and Expansion Stage Firms	0.68	0.47	0.38	0.57	1.00
Proportion of Late and Buyout Stage Firms	0.32	0.53	0.63	-0.57	0.00
Proportion of Common Equity Investments	0.45	0.80	0.46	2.11**	0.43
Proportion of Convertible and Other Securities	0.55	0.20	0.54	-2.16**	0.57
Average # Syndicated Investors	0.97	1.33	1.17	0.78	1.29
Average Ownership % of All Investors	49.76%	60.00%	54.60%	0.01	43.82%
Proportion of Investments with Majority Investor Ownership	0.54	0.73	0.71	0.12	0.43
Average Total # Types of Veto Rights <sup>1</sup>	3.57	3.93	4.33	-3.63***	3.00
Average Total # Types of Control Rights <sup>2</sup>	4.51	4.73	5.25	-4.58***	4.43
Average Total # Types of Contingencies <sup>3</sup>	1.59	0.33	0.17	1.21	0.79
Average All Investor Board Seats / Total Board Seats	0.42	0.49	0.50	-0.15	0.50
Proportion of Investments with Right to Replace CEO	0.40	0.53	0.63	-0.57	0.36
Average Number of Investment Months	25	37	32	1.02	18
Average Public Market Return over Investment Period	-0.06	0.18	0.11	1.31	-0.05
Average Legality Index	19.80	20.04	20.53	-0.81	20.28

This table presents a summary of the data by (column 1) the total sample, (2) actual IPOs, (3) actual takeovers, (5) actual liquidations, (6) actual and expected IPOs, (7) actual and expected takeovers, (9) actual and expected liquidations, and (10) unexited investments (the total sample excluding actual and expected exits). Proportions represent the fraction of the number of observations on the top row for each column. Investment years span 1995 - 2002. Exit years span 1996 - 2004. Expected exits only in 2003 and 2004. Comparison tests for differences in means and proportions of various characteristics of the investors and entrepreneurs for each of the different exit outcomes: (4) actual IPOs and takeovers, and (8) combined actual and expected IPOs versus takeovers. \*, \*\*, \*\*\* significant at the 10%, 5% and 1% levels, respectively.

1. The 5 categories include veto rights over asset sales, asset purchases, changes in control, issuances of equity and other.

2. The 9 categories of control rights include automatic conversion to common equity on exit, first refusal in sale, co-sale agreement, antidilution protection, protection rights against new issues, redemption at option of investors, information rights in operations and financials, IPO registration rights, and piggyback registration rights.

3. The 4 categories of contingencies include financial performance, non-financial performance, taking certain actions and sale of shares.

Table I continues on the following page...

Table I. (Continued)					
	(6)	(7)	(8)	(9)	(10)
	Actual + Expected IPOs	Actual + Expected Takeovers	test of (6) versus (7)	Actual + Expected Liquidations	Unexited (Actual or Expected) Investments
Total Number of Observations (# Entrepreneurial Firms)	38	72	-3.10***	30	93
Proportion of Limited Partnership Investors	0.66	0.67	-0.09	0.70	0.62
Proportion of Other Types of Investors	0.34	0.33	0.10	0.30	0.38
Average Capital Managed by Investor ('000 Euros)	€ 1,161,989.00	€ 811,397.22	1.17	€ 820,959.10	€ 430,920.73
Average IRR	0.64	0.45	0.63	-0.59	0.06
Average Market / Book	2.76	3.14	-0.32	0.28	1.21
Average Market Value ('000 Euros)	€ 27,662.10	€ 50,611.00	-0.61	€ 4,376.91	€ 7,228.37
Average Book Value ('000 Euros)	€ 9,204.51	€ 7,251.48	0.64	€ 6,732.78	€ 6,368.62
Proportion of all types of High Tech Firms	0.61	0.53	0.80	0.60	0.51
Proportion of Biotech / Medical Firms	0.08	0.10	-0.32	0.15	0.14
Proportion of Computer / Electronics Firms	0.13	0.15	-0.30	0.10	0.29
Proportion of Communications / Internet Firms	0.39	0.28	1.25	0.35	0.08
Proportion of Early and Expansion Stage Firms	0.71	0.65	0.61	0.75	0.67
Proportion of Late and Buyout Stage Firms	0.29	0.35	-0.61	0.25	0.33
Proportion of Common Equity	0.71	0.38	3.35***	0.30	0.43
Proportion of Convertible and Other Securities	0.29	0.63	-3.39***	0.70	0.57
Average # Syndicated Investors	1.08	1.13	-0.22	1.25	0.75
Average Ownership % of All Investors	45.98%	49.83%	-0.01	50.43%	51.10%
Proportion of Investments with Majority Investor Ownership	0.55	0.56	-0.10	0.55	0.52
Average Total # Types of Veto Rights <sup>1</sup>	0.61	0.75	-1.60	3.15	3.73
Average Total # Types of Control Rights <sup>2</sup>	0.45	0.59	-2.74***	5.00	3.99
Average Total # Types of Contingencies <sup>3</sup>	1.71	1.53	0.46	0.90	1.74
Average All Investor Board Seats / Total Board Seats	0.36	0.48	-2.43**	0.52	0.39
Proportion of Investments with Right to Replace CEO	0.29	0.47	-1.85*	0.45	0.39
Average Number of Investment Months	27	27	0.06	16.30	24
Average Public Market Return over Investment Period	0.01	-0.04	1.17	-0.08	-0.10
Average Legality Index	20.07	19.89	0.39	20.60	19.44

Table II. Panel A. Correlation Matrix

	IPO Dummy	Takeover Dummy	Liquidation Dummy	Log of Legality Index	Limited Partnership Investor Dummy	Log of Total Investor Capital	IRR	Market / Book	Log of Book Value	Late / Buyout Stage	High-Tech Dummy	Medical / Biotech Dummy	Computer / Electronics Dummy	Internet / Communications Dummy	Common Equity Dummy	Convertible Preferred Equity Dummy	Investor Board Seats / Total Board Seats	Majority Investor Ownership % Dummy	# Investor Veto Rights	# Investor Control Rights	Investor Right to Replace CEO Dummy	# Syndicated Investors	# Contractual Contingencies	Investment Months	MSCI Return
IPO Dummy	1.00																								
Takeover Dummy	<u>-0.72</u>	1.00																							
Liquidation Dummy	<u>-0.27</u>	<u>-0.48</u>	1.00																						
Log of Legality Index	0.01	-0.09	0.10	1.00																					
Limited Partnership Investor Dummy	-0.02	-0.01	0.03	<u>-0.19</u>	1.00																				
Log of Total Investor Capital	-0.01	0.03	-0.02	0.17	0.02	1.00																			
IRR	0.14	0.09	<u>-0.30</u>	-0.08	0.03	0.01	1.00																		
Market / Book	0.02	0.09	-0.14	0.00	-0.04	0.15	<u>0.73</u>	1.00																	
Log of Book Value	0.05	-0.04	-0.01	0.11	<u>0.25</u>	<u>0.37</u>	0.06	<u>0.19</u>	1.00																
Late / Buyout Stage	-0.04	0.08	-0.06	0.08	<u>0.34</u>	0.14	0.08	0.06	<u>0.46</u>	1.00															
High-Tech Dummy	0.06	-0.08	0.03	-0.16	-0.13	-0.09	0.02	0.07	<u>-0.38</u>	<u>-0.47</u>	1.00														
Medical / Biotech Dummy	-0.05	-0.01	0.07	-0.01	0.02	<u>0.23</u>	-0.07	-0.03	-0.08	-0.12	<u>0.29</u>	1.00													
Computer / Electronics Dummy	-0.01	0.05	-0.05	-0.01	0.05	-0.11	-0.06	-0.05	-0.07	-0.08	<u>0.35</u>	-0.13	1.00												
Internet / Communications Dummy	0.10	-0.11	0.02	-0.16	<u>-0.18</u>	-0.15	0.11	0.13	<u>-0.30</u>	<u>-0.36</u>	<u>0.61</u>	<u>-0.23</u>	<u>-0.28</u>	1.00											
Common Equity Dummy	<u>0.32</u>	<u>-0.19</u>	-0.14	<u>-0.28</u>	0.16	-0.14	0.17	0.16	0.10	-0.10	0.07	0.10	0.08	-0.05	1.00										
Convertible Preferred Equity Dummy	-0.16	0.07	0.11	0.16	<u>-0.31</u>	0.03	-0.12	-0.12	-0.16	-0.16	0.00	<u>-0.23</u>	0.00	0.14	<u>-0.65</u>	1.00									
Investor Board Seats / Total Board Seats	<u>-0.20</u>	<u>0.22</u>	-0.05	<u>-0.24</u>	0.10	<u>0.29</u>	0.05	0.04	<u>0.21</u>	<u>0.20</u>	0.05	0.13	-0.06	0.01	-0.06	-0.07	1.00								
Majority Investor Ownership % Dummy	0.00	0.00	0.00	<u>0.22</u>	0.13	0.22	-0.05	-0.02	0.12	<u>0.41</u>	<u>-0.20</u>	0.04	0.00	<u>-0.24</u>	-0.13	-0.03	0.16	1.00							
# Investor Veto Rights	-0.12	0.15	-0.06	-0.02	<u>-0.24</u>	<u>0.40</u>	0.03	0.04	0.14	<u>0.18</u>	-0.10	0.07	-0.13	-0.06	-0.16	0.05	<u>0.41</u>	<u>0.16</u>	1.00						
# Investor Control Rights	<u>-0.23</u>	<u>0.19</u>	0.02	0.10	-0.09	<u>0.30</u>	-0.09	0.02	-0.05	0.01	-0.07	0.12	0.04	<u>-0.18</u>	<u>-0.36</u>	0.16	0.12	<u>0.27</u>	<u>0.51</u>	1.00					
Investor Right to Replace CEO Dummy	-0.16	0.13	0.03	0.14	0.13	<u>0.39</u>	-0.08	-0.03	0.18	<u>0.23</u>	-0.14	<u>0.24</u>	0.02	<u>-0.32</u>	<u>-0.19</u>	-0.09	<u>0.28</u>	<u>0.32</u>	<u>0.53</u>	<u>0.51</u>	1.00				
# Syndicated Investors	-0.03	-0.01	0.05	0.04	<u>-0.19</u>	0.01	-0.04	0.08	-0.10	-0.01	0.09	-0.02	<u>0.20</u>	-0.04	-0.08	0.01	<u>-0.27</u>	<u>0.18</u>	0.03	0.15	0.03	1.00			
# Contractual Contingencies	0.08	0.03	-0.13	-0.13	<u>-0.27</u>	-0.15	-0.14	-0.15	-0.05	-0.13	-0.05	-0.17	0.04	0.02	-0.06	0.22	0.02	<u>-0.19</u>	0.10	-0.12	-0.08	-0.08	1.00		
Investment Months	0.07	0.11	<u>-0.25</u>	-0.09	<u>0.19</u>	<u>0.29</u>	0.01	0.06	0.11	<u>0.19</u>	-0.14	0.17	0.05	<u>-0.29</u>	<u>0.22</u>	<u>-0.27</u>	<u>0.18</u>	<u>0.37</u>	0.07	<u>0.18</u>	<u>0.19</u>	0.07	<u>-0.19</u>	1.00	
MSCI Return	0.14	-0.04	-0.11	0.17	<u>0.25</u>	<u>0.47</u>	<u>0.27</u>	<u>0.29</u>	<u>0.33</u>	<u>0.28</u>	-0.12	0.17	0.02	<u>-0.25</u>	0.16	<u>-0.30</u>	<u>0.23</u>	<u>0.24</u>	<u>0.25</u>	0.08	<u>0.37</u>	0.04	<u>-0.19</u>	<u>0.43</u>	1.00

Note - Correlation coefficients for the sample of actual and expected exits only: 130 observations. Correlation coefficients significant at the 5% level are highlighted in underline font.

Table II. Panel B. Correlations Across Country Dummy Variables

	Germany	Czech	The Netherlands	Switzerland	Italy	Denmark	France	Belgium	Austria	Portugal
Common Equity Dummy	<u>-0.21</u>	0.10	<u>-0.22</u>	<u>0.20</u>	0.13	<u>-0.20</u>	-0.12	-0.04	<u>0.25</u>	0.14
Convertible Preferred Equity Dummy	<u>0.33</u>	-0.06	-0.12	<u>-0.25</u>	-0.17	<u>0.31</u>	<u>0.18</u>	0.09	-0.14	-0.09
Investor Board Seats / Total Board Seats	-0.14	0.10	0.10	<u>0.21</u>	0.08	0.02	-0.11	<u>-0.29</u>	-0.16	-0.07
Majority Investor Ownership % Dummy	-0.14	0.08	0.17	<u>0.18</u>	0.13	-0.10	-0.01	0.17	-0.15	0.11
# Investor Veto Rights	<u>-0.24</u>	-0.14	0.16	<u>0.26</u>	-0.02	0.12	0.03	<u>-0.32</u>	0.05	0.03
# Investor Control Rights	<u>-0.33</u>	<u>-0.18</u>	<u>0.25</u>	<u>0.17</u>	<u>-0.26</u>	<u>0.22</u>	0.01	<u>0.26</u>	<u>-0.18</u>	0.06
Investor Right to Replace CEO Dummy	<u>-0.34</u>	-0.07	<u>0.20</u>	<u>0.43</u>	-0.16	0.11	0.15	-0.15	-0.01	0.02
# Syndicated Investors	-0.03	-0.09	-0.07	-0.04	0.08	0.07	0.16	0.03	-0.01	0.04
# Contractual Contingencies	0.08	-0.07	-0.16	<u>-0.29</u>	-0.08	<u>0.20</u>	-0.03	-0.08	<u>0.36</u>	-0.07
IPO Dummy	-0.03	-0.06	<u>-0.27</u>	0.14	0.09	-0.06	0.06	0.05	<u>0.20</u>	0.06
Takeover Dummy	0.05	0.08	<u>0.21</u>	-0.16	-0.09	-0.02	-0.01	-0.09	-0.09	-0.14
Liquidation Dummy	-0.03	-0.04	0.05	0.05	0.01	0.11	-0.05	0.07	-0.12	0.12

Note - Correlation coefficients for the sample of actual and expected exits only: 130 observations. There were no actual or expected exits from Poland in the database. Correlation coefficients significant at the 5% level are highlighted in underline font.

Table III. Base Model Multinomial Logit Estimates of Exit Outcomes

## Panel A. Actual Exits Only

	Model (1)						Model (2)						Model (3)					
	IPO		Takeover		Liquidation		IPO		Takeover		Liquidation		IPO		Takeover		Liquidation	
	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic
Constant	-0.24	-2.79***	0.24	2.23**	0.01	0.07	-1.85	-3.00***	-0.46	-0.46	2.32	2.43	-2.22	-2.81***	0.25	0.22	1.97	1.90*
Limited Partnership Dummy	-	-	-	-	-	-	0.52	2.84***	-0.37	-1.60	-0.15	-0.83	0.54	2.54**	-0.44	-1.66*	-0.10	-0.50
Common Equity Dummy	0.30	2.39**	-0.17	-1.23	-0.13	-1.01	0.25	2.16**	-0.13	-0.85	-0.12	-0.87	0.29	2.06**	-0.23	-1.29	-0.06	-0.38
Right to Replace CEO Dummy Variable	-	-	-	-	-	-	-0.31	-2.16**	0.16	0.77	0.16	0.88	-0.34	-1.74*	0.21	0.86	0.13	0.69
Majority Investor Ownership % Dummy	-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.26	0.09	0.45	-0.13	-0.89
Number of Contingencies	-	-	-	-	-	-	-	-	-	-	-	-	0.11	0.78	-0.16	-1.08	0.05	0.57
Number of Syndicated Investors	-	-	-	-	-	-	-	-	-	-	-	-	-0.04	-0.51	0.04	0.47	-0.01	-0.08
Log of Book Value	-	-	-	-	-	-	0.15	2.24**	0.12	1.04	-0.26	-2.42**	0.18	2.17**	0.05	0.42	-0.23	-2.01**
High-Tech Entrepreneurial Firm	-	-	-	-	-	-	-	-	-	-	-	-	0.08	0.64	-0.24	-1.29	0.15	0.99
MSCI Public Market Return	-	-	-	-	-	-	0.65	2.06**	0.19	0.39	-0.84	-2.04**	0.60	1.70*	0.02	0.05	-0.63	-1.53
Number of Observations	53						53						53					
Loglikelihood	-53.70						-39.51						-37.04					
Chi-squared	5.76*						34.15***						39.09***					
Actual Outcomes	Model's Predicted Outcomes			Model's Predicted Outcomes			Model's Predicted Outcomes			Model's Predicted Outcomes			Model's Predicted Outcomes			Model's Predicted Outcomes		
	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation
IPO	12	3	0	12	2	1	11	3	1	11	3	1	11	3	1	11	3	1
Takeover	11	13	0	3	19	2	4	17	3	4	17	2	4	17	3	4	17	2
Liquidation	6	8	0	2	3	9	1	5	8	1	5	9	1	5	8	1	5	8

Note - Multinomial logit estimates of the exit outcomes: IPO, takeover, and liquidation. Independent variables include dummy variables equal to 1 for limited partnerships, common equity, the right to replace the entrepreneur as CEO, majority investor ownership % (including syndicated investors), and high-tech entrepreneurial firms, as well as variables for the number of contractual contingencies, the number of syndicated investors, the log of the book value of the investment, and the MSCI public market return over the investment period. Actual exits only (expected exits and non-exited investments excluded from the sample in Panel A). Other variables not reported to exclude collinearity, and/or if there was no variation in one of the dependent variables and the (excluded) independent variable. White's (1980) HCCME is used. Values reported are not the standard multinomial logit coefficients, but rather, they are the marginal effects and therefore indicate the change in probability in the exit outcome associated with a change in the independent variable.

Table III. Base Model Multinomial Logit Estimates of Exit Outcomes

Panel B. Actual and Expected Exits

	Model (1)						Model (2)						Model (3)					
	IPO		Takeover		Liquidation		IPO		Takeover		Liquidation		IPO		Takeover		Liquidation	
	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic	Marginal Effect	t-Statistic
Constant	-0.29	-3.61***	0.28	3.50***	0.003	0.12	-0.21	-0.58	-0.02	-0.06	0.23	1.78*	-0.37	-0.93	0.14	0.33	0.23	1.69*
Limited Partnership Dummy	-	-	-	-	-	-	-0.08	-0.85	0.07	0.68	0.02	0.78	-0.07	-0.68	0.05	0.50	0.02	0.70
Common Equity Dummy	0.31	3.71***	-0.26	-2.91***	-0.05	-1.28	0.27	2.96***	-0.24	-2.54**	-0.03	-1.39	0.28	2.97***	-0.25	-2.58***	-0.03	-1.24
Right to Replace CEO Dummy Variable	-	-	-	-	-	-	-0.20	-1.94*	0.20	1.95*	-0.001	-0.05	-0.23	-2.13**	0.23	2.11**	0.001	0.07
Majority Investor Ownership % Dummy	-	-	-	-	-	-	-	-	-	-	-	-	0.11	1.06	-0.10	-0.93	-0.01	-0.55
Number of Contingencies	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.77	-0.03	-0.83	0.002	0.28
Number of Syndicated Investors	-	-	-	-	-	-	-	-	-	-	-	-	-0.02	-0.34	0.02	0.35	-0.0003	-0.03
Log of Book Value	-	-	-	-	-	-	0.01	0.17	0.02	0.50	-0.03	-1.85*	0.01	0.35	0.01	0.31	-0.03	-1.83*
High-Tech Entrepreneurial Firm	-	-	-	-	-	-	-	-	-	-	-	-	0.08	0.87	-0.09	-0.96	0.01	0.42
MSCI Public Market Return	-	-	-	-	-	-	0.50	1.47	-0.34	-0.97	-0.16	-1.36	0.41	1.21	-0.26	-0.73	-0.15	-1.34
Expected Exit Dummy	0.04	0.46	0.14	1.53	-0.18	-3.98***	0.05	0.43	0.09	0.63	-0.14	-1.84*	0.001	0.01	0.15	0.91	-0.15	-1.86*
Number of Observations	130						130						130					
Loglikelihood	-104.86						-91.25						-89.69					
Chi-squared	32.40***						59.60***						63.73***					
Actual Outcomes	Model's Predicted Outcomes						Model's Predicted Outcomes						Model's Predicted Outcomes					
	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation	IPO	Takeover	Liquidation
IPO	12	26	0	11	25	2	14	22	2	13	61	2	1	4	11			
Takeover	11	65	0	16	58	2	13	61	2	13	61	2	1	4	11			
Liquidation	6	10	0	1	4	11	1	4	11	1	4	11	1	4	11			

Note - Multinomial logit estimates of the exit outcomes: IPO, takeover and liquidation. Independent variables include dummy variables equal to 1 for limited partnerships, common equity, the right to replace the entrepreneur as CEO, majority investor ownership % (including syndicated investors), high-tech entrepreneurial firms, and a dummy for expected exits, as well as variables for the number of contractual contingencies, the number of syndicated investors, the log of the book value of the investment, and the MSCI public market return over the investment period. Actual and expected exits (non-exited investments excluded from the sample in Panel B). Other variables not reported to exclude collinearity, and/or if there was no variation in one of the dependent variables and the (excluded) independent variable. White's (1980) HCCME is used. Values reported are not the standard multinomial logit coefficients, but rather, they are the marginal effects and therefore indicate the change in probability in the exit outcome associated with a change in the independent variable.

Table IV. Binomial Logit Estimates of IPOs versus Takeovers

	Model (1) Actual Exits		Model (1) Actual+Expected		Model (2) Actual Exits		Model (2) Actual+Expected		Model (3) Actual Exits		Model (3) Actual+Expected	
	Marginal Effect	t-statistic	Marginal Effect	t-statistic	Marginal Effect	t-statistic	Marginal Effect	t-statistic	Marginal Effect	t-statistic	Marginal Effect	t-statistic
Constant	-2.36	-2.06	-0.20	-0.53	-1.08	-1.19	0.20	0.49	-4.73	-1.00	-2.25	-1.62
Limited Partnership Dummy	0.88	2.59***	-0.08	-0.78	0.64	2.05**	-0.08	-0.77	1.08	2.15**	-0.01	-0.06
Log (Investor Capital)	--	--	--	--	--	--	--	--	0.05	0.38	0.01	0.38
Common Equity Dummy	0.43	2.26	0.27	2.76***	0.29	1.72*	0.26	2.76***	0.44	1.90*	0.35	3.15***
Right to Replace CEO Dummy	-0.52	-2.16**	-0.19	-1.74*	-0.36	-1.28	-0.18	-1.79*	-0.60	-1.20	-0.20	-1.58
Majority Investor Ownership % Dummy	--	--	--	--	-0.15	-0.70	0.09	0.87	-0.08	-0.26	0.10	0.81
Number of Contingencies	--	--	--	--	-0.05	-0.20	0.02	0.61	-0.001	-0.002	0.03	0.82
Number of Syndicated Investors	--	--	--	--	0.04	0.48	-0.01	-0.33	0.01	0.07	0.00	-0.04
Log (Book Value)	0.15	1.32	-0.002	0.06	0.10	1.02	0.01	0.16	0.15	1.10	0.00	0.11
High-Tech Entrepreneurial Firm	--	--	--	--	0.12	0.74	0.07	0.73	--	--	--	--
Medical / Biotech Dummy	--	--	--	--	--	--	--	--	0.27	0.67	-0.05	-0.30
Computers / Electronics Dummy	--	--	--	--	--	--	--	--	-0.18	-0.57	-0.01	-0.03
Internet / Communications Dummy	--	--	--	--	--	--	--	--	0.13	0.51	0.18	1.52
MSCI Public Market Return	1.18	1.94*	0.59	1.51	0.84	1.57	0.44	1.11	0.91	1.10	0.40	0.91
Log (Country Legality Index)	--	--	--	--	--	--	--	--	0.55	0.36	0.55	1.30
Expected Exit Dummy Variable	--	--	--	--	--	--	-0.003	-0.02	--	--	0.01	0.08
Number of Observations	39		110		39		110		39		110	
Loglikelihood	-18.34		-62.76		-17.86		-61.88		-17.10		-60.01	
Chi-squared	15.29***		16.29**		16.25*		18.05*		17.78		21.80*	
Actual Outcomes	Predicted Outcomes		Predicted Outcomes		Predicted Outcomes		Predicted Outcomes		Predicted Outcomes		Predicted Outcomes	
	Takeover	IPO	Takeover	IPO	Takeover	IPO	Takeover	IPO	Takeover	IPO	Takeover	IPO
Takeover	20	4	57	15	19	5	59	13	20	4	59	13
IPO	3	12	25	13	2	13	24	14	3	12	19	19

Note: Liquidations are excluded from the data. The first regression in each model only considers actual exits; the second considers actual and expected exits in the data. Independent variables include dummy variables equal to 1 for limited partnerships, common equity, the right to replace the entrepreneur as CEO, majority investor ownership % (including syndicated investors), high-tech entrepreneurial firms (and specific industry types), and dummy variables for expected exits, as well as variables for the log of the capital managed by the investor, the number of contractual contingencies, the number of syndicated investors, the log of the book value of the investment, the MSCI public market return over the investment period, and the log of the country legality index. Other variables not reported to exclude collinearity, and/or if there was no variation in one of the dependent variables and the (excluded) independent variable. White's (1980) HCCME is used. Values reported are not the standard logit coefficients, but rather, they are the marginal effects and therefore indicate the change in probability in the exit outcome associated with a change in the independent variable.

Table V. Instrumental Variable Binomial Logit Estimates of IPOs versus Takeovers

	Step 1. OLS Estimates of Market / Book Values		Step 1: Cox Proportional Hazard Model of Duration (Months)		Step 2: Model (1) Actual Exits		Step 2: Model (2) Actual + Expected Exits		Step 2: Model (3) Actual Exits		Step 2: Model (4) Actual + Expected Exits	
	Marginal Effect	t-statistic	Marginal Effect	t-statistic	Marginal Effect	t-statistic	Marginal Effect	t-statistic	Marginal Effect	t-statistic	Marginal Effect	t-statistic
Constant	-0.87	-0.09	N/A	N/A	-2.43	-1.91*	-0.27	-0.65	-1.81	-1.22	-0.52	-1.15
Limited Partnership Dummy	-0.68	-0.81	0.24	1.31	0.92	2.42**	-0.12	-1.06	1.46	2.48**	-0.15	-1.23
Common Equity Dummy	0.93	1.29	-0.06	-0.41	0.14	0.53	0.27	2.68***	-0.11	-0.33	0.35	3.15***
Right to Replace CEO Dummy	-0.06	-0.07	-0.05	-0.30	-1.19	-2.34**	-0.22	-1.88*	-1.76	-2.23	-0.22	-1.81*
Majority Investor Ownership % Dummy	-0.82	-1.04	-0.50	-2.79***	--	--	--	--	-0.55	-1.13	0.12	0.92
Number of Contingencies	-0.08	-0.52	0.06	1.80*	--	--	--	--	-0.38	-0.70	-0.01	-0.22
Number of Syndicated Investors	0.50	1.33	0.03	0.39	--	--	--	--	-0.09	0.60	0.02	0.39
Log (Book Value)	0.33	1.20	0.115	2.04**	0.26	1.91*	0.02	0.38	0.27	1.83*	0.04	0.77
High-Tech Entrepreneurial Firm	--	--	--	--	0.31	1.32	0.10	0.90	0.36	1.25	--	--
Medical / Biotech Dummy	-0.05	-0.05	0.24	1.21	--	--	--	--	--	--	-0.05	-0.33
Computers / Electronics Dummy	-0.37	-0.32	0.26	1.05	--	--	--	--	--	--	-0.07	-0.39
Internet / Communications Dummy	2.15	2.18**	0.56	2.59***	--	--	--	--	--	--	0.30	2.03**
MSCI Public Market Return	3.34	1.02	-6.09	-7.08***	2.52	1.56	1.05	1.58	3.15	1.50	1.72	2.09**
Log (Country Legality Index)	-0.04	-0.01	1.50	2.52**	--	--	--	--	--	--	--	--
Step 1 Fitted Market / Book Values	--	--	--	--	0.10	-1.57	-0.03	-1.10	-0.12	-1.62	-0.07	-1.90*
Step 2 Fitted Duration Values	--	--	--	--	-0.48	-0.75	0.10	0.41	-1.26	-1.05	0.24	0.84
Exit in 1999 Dummy Variable	0.36	0.15	0.86	1.60	--	--	--	--	--	--	--	--
Exit in 2000 Dummy Variable	6.28	3.74***	1.22	3.32***	--	--	--	--	--	--	--	--
Exit in 2001 Dummy Variable	0.06	0.04	0.56	1.66*	--	--	--	--	--	--	--	--
Exit in 2002 Dummy Variable	-0.81	-0.55	0.00	0.00	--	--	--	--	--	--	--	--
Exit in 2003 Dummy Variable	-0.43	-0.31	0.17	0.58	--	--	--	--	--	--	--	--
Expected Exit Dummy Variable	-0.84	-0.95	-0.19	-1.01	--	--	-0.008	-0.05	--	--	0.01	0.04
Number of Observations	223		223		39		110		39		110	
Loglikelihood	-662.16		-948.77		-15.07		-61.91		-13.62		-59.07	
Chi-squared	Adjusted R <sup>2</sup> = 0.16		92.99***		21.82***		18.00**		24.72***		23.66*	
Actual Outcomes					Predicted Outcomes		Predicted Outcomes		Predicted Outcomes		Predicted Outcomes	
Takeover					Takeover	IPO	Takeover	IPO	Takeover	IPO	Takeover	IPO
IPO					21	3	57	15	21	3	59	13
					3	15	24	14	3	12	21	17

Note: Liquidations are excluded from the data. N/A: not applicable. The fitted valued for market / book (based on OLS) are based on model (1). The fitted values for duration (# investment months) (based on Cox's proportional hazard model) are reported in model (2). Independent variables include dummy variables equal to 1 for limited partnerships, common equity, the right to replace the entrepreneur as CEO, majority investor ownership % (including syndicated investors), high-tech entrepreneurial firms (and specific industry types), and dummy variables for expected exits, as well as variables for the log of the capital managed by the investor, the number of contractual contingencies, the number of syndicated investors, the log of the book value of the investment, the MSCI public market return over the investment period, and the log of the country legality index. Other variables not reported to exclude collinearity, and/or if there was no variation in one of the dependent variables and the (excluded) independent variable. White's (1980) HCCME is used. Values reported are not the standard logit coefficients, but rather, they are the marginal effects and therefore indicate the change in probability in the exit outcome associated with

Table VI. Bivariate Probit Estimates of IPOs versus Takeovers with Sample Selection

	Model (1)				Model (2)				Model (3)			
	Step 1: Determinants of Actual Exits (only)		Step 2: Choice between IPO and Takeover Given Exit		Step 1: Determinants of Actual+Expected Exit		Step 2: Choice between IPO and Takeover Given Exit		Step 1: Determinants of Actual+Expected Exit		Step 2: Choice between IPO and Takeover Given Exit	
	Coefficient	t-statistic	Marginal Effect	t-statistic	Coefficient	t-statistic	Marginal Effect	t-statistic	Coefficient	t-statistic	Marginal Effect	t-statistic
Constant	-0.88	-6.89***	-1.62	-1.34*	0.12	1.39	-1.92	-1.38	0.12	1.34	-1.75	-1.08
Limited Partnership Dummy	--	--	0.55	1.60	--	--	-0.05	-0.41	--	--	-0.08	-0.52
Log (Investor Capital)	--	--	--	--	--	--	--	--	--	--	0.01	0.34
Common Equity Dummy	--	--	0.30	1.73*	--	--	0.32	2.94***	--	--	0.33	2.47**
Right to Replace CEO Dummy	--	--	-0.33	-1.97**	--	--	-0.22	-1.60	--	--	0.02	0.58
Majority Investor Ownership % Dummy	--	--	--	--	--	--	0.10	0.81	--	--	-0.25	-1.67*
Number of Contingencies	--	--	--	--	--	--	0.02	0.68	--	--	0.11	0.73
Number of Syndicated Investors	--	--	--	--	--	--	-0.02	-0.31	--	--	-0.01	-0.18
Log (Book Value)	--	--	0.12	1.05	--	--	0.03	0.06	--	--	0.00	0.05
High-Tech Entrepreneurial Firm	--	--	0.08	0.52	--	--	0.09	0.79	--	--	0.09	0.81
MSCI Public Market Return	5.67	11.91***	--	--	2.20	4.20***	--	--	2.19	4.17***	--	--
Log (Country Legality Index)	--	--	--	--	--	--	0.45	1.02	--	--	0.34	0.70
Two Stage Market/Book Fitted Values	--	--	--	--	--	--	--	--	--	--	-0.02	-0.53
Two Stage Duration Fitted Values	--	--	--	--	--	--	--	--	--	--	0.13	0.34
Expected Exit Dummy Variable	--	--	--	--	--	--	-0.03	-0.21	--	--	-0.043	-0.24
Number of Observations	223		39		223		110		223		110	
Loglikelihood			-85.92				-208.76				-208.50	
Actual Outcomes	Selected Outcomes		Predicted Outcomes		Selected Outcomes		Predicted Outcomes		Selected Outcomes		Predicted Outcomes	
	No Exit	Exit	Takeover	IPO	No Exit	Exit	Takeover	IPO	No Exit	Exit	Takeover	IPO
No Exit (Step 1)   Takeover (Step 2)	0	24	8	10	0	72	75	23	0	72	75	22
Exit (Step 1)   IPO (Step 2)	0	15	11	10	0	38	0	12	0	38	0	13

Note: Liquidations are excluded from the data. The bivariate probit model with sample selection introduced by Wynand and van Praag (1981). The step 1 estimates are based on simultaneous estimation with the step 2 estimates; therefore, the marginal effects are not the same for step 1 in models (2) and (3). The step 2 estimates exclude the MSCI return variable to mitigate collinearity problems in the joint estimation. The fitted values for models (2) and (3) market/book and duration variables are based on the estimates in Table V. Independent variables include dummy variables equal to 1 for limited partnerships, common equity, the right to replace the entrepreneur as CEO, majority investor ownership % (including syndicated investors), high-tech entrepreneurial firms (and specific industry types), and dummy variables for expected exits, as well as variables for the log of the capital managed by the investor, the number of contractual contingencies, the number of syndicated investors, the log of the book value of the investment, the MSCI public market return over the investment period, and the log of the country legality index.

Other variables not reported to exclude collinearity, and/or if there was no variation in one of the dependent variables and the (excluded) independent variable. White's (1980) HCCME is used. Values reported are not the standard logit coefficients, but rather, they are the marginal effects and therefore indicate the change in probability in the exit outcome associated with a change in the independent variable.

Table VII. OLS and Heckman Selection Estimates of Realized IRRs

	Model (1)		Model (2)		Model (3)				Model (4)			
	OLS Estimates of Log(1+IRR)		OLS Estimates of Log(1+IRR)		Step 1: Determinants of IPO or Takeover Actual Exit		Step 2: Heckman Selection Estimates of Log(1+IRR)		Step 1: Determinants of Actual Exits (All Types)		Step 2: Heckman Selection Estimates of Log(1+IRR)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	2.00	1.81*	5.08	2.09**	-1.56	-6.58***	0.76	0.43	-0.93	-4.85***	5.10	2.40**
Limited Partnership Dummy	-0.08	-0.26	-0.26	-1.38	--	--	-0.05	-0.18	--	--	-0.26	-1.63
Common Equity Dummy	0.32	1.58	0.24	1.56	--	--	0.34	1.59	--	--	0.24	1.82*
Right to Replace CEO Dummy	0.03	0.11	0.12	0.54	--	--	0.06	0.19	--	--	0.12	0.64
Majority Investor Ownership % Dummy	-0.32	-1.36	-0.29	-1.91*	--	--	-0.29	-1.19	--	--	-0.30	-2.20**
Number of Contingencies	--	--	0.04	0.43	--	--	--	--	--	--	0.03	0.50
Number of Syndicated Investors	--	--	-0.07	-1.05	--	--	--	--	--	--	-0.07	-1.22
Log (Book Value)	-0.18	-1.63	-0.12	-1.37	--	--	-0.20	-1.65*	--	--	-0.12	-1.62
Computer / Electronics Dummy	-0.12	-0.39	-0.05	-0.20	--	--	-0.20	-0.56	--	--	-0.05	-0.230
Internet / Communications Dummy	0.53	2.34**	0.42	2.30**	--	--	0.55	2.26**	--	--	0.42	2.71***
Medical / Biotech Dummy	-0.11	-0.37	-0.04	-0.16	--	--	-0.11	-0.33	--	--	-0.04	-0.19
MSCI Public Market Return	0.99	1.59	0.68	1.59	12.26	6.50***	4.77	1.22	9.82	6.49***	0.63	0.48
Log (Country Legality Index)	--	--	-1.11	-1.47	--	--	--	--	--	--	-1.11	-1.74*
Takeover Exit Dummy	0.14	0.66	0.07	0.44	--	--	0.25	1.05	--	--	0.07	0.51
Liquidation Exit Dummy	--	--	-0.77	-3.43***	--	--	--	--	--	--	-0.77	-3.85***
Heckman's Lambda	--	--	--	--	--	--	0.87	0.97	--	--	-0.01	-0.04
Number of Observations	39		53		223		39		223		53	
Loglikelihood	-22.99		-24.15		-63.81		-14.90		-88.60		-14.63	
Chi-square	--		--		79.12***		--		67.38***		--	
Adjusted R <sup>2</sup>	0.19		0.36		--		0.19		--		0.34	
	--		--		Selected Outcomes		--		Selected Outcomes		--	
Actual Outcomes	--		--		No IPO or Takeover	IPO or Takeover	--		No Exit	Exit	--	
No Exit	--		--		182	2	--		168	2	--	
Exit	--		--		18	21	--		25	28	--	

Note: Non-exited investments are excluded from the data for models (1) and (2). Liquidations exits are excluded from the data in model (2). Models (3) and (4) make use of the Heckman (1976, 1979) selection procedure: the step 1 estimates consider the determinants of exit (only actual IPOs and takeovers in model 3, and all types of actual exits in model 4); the step 2 uses the selection method to estimate the determinants of the realized returns. Independent variables include dummy variables equal to 1 for limited partnerships, common equity, the right to replace the entrepreneur as CEO, majority investor ownership % (including syndicated investors), specific industry types, and dummy variables for expected exits, as well as variables for the number of contractual contingencies, the number of syndicated investors, the log of the book value of the investment, the MSCI public market return over the investment period, and the log of the country legality index. Other variables not reported to exclude collinearity, and/or if there was no variation in one of the dependent variables and the (excluded) independent variable. White's (1980) HCCME is used.

## Endnotes

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<sup>1</sup> Additional factors discussed by Brau *et al.* (2003) include the transaction costs of effecting a sale, the ongoing costs of operating as a public versus a private firm, managerial incentives post-exit, transaction synergies, capital raising constraints, the benefits of public profile to the firm, as well as regulatory factors and legality. See also Ang and Brau (2003), Ang and Kohers (2001), Brennan and Franks (1997), Chemmanur and Fulghieri (1999), Gomes (1999), Kohers and Kohers (2000) Maug (1999), Stoughton *et al.* (1999), Bolton and von Thadden (1998), Mello and Parsons (1998), Pagano *et al.* (1998), Pagano and Roell (1998), Roell (1996), Stoughton and Zechner (1998), Shah and Thakor (1998).

<sup>2</sup> The signaling conjecture is consistent with Garmaise's (2000) pecking order capital structure theory, which is an exact reversal of the well-established Myers and Majluf (1984) theory that common equity is a signal of low quality. Garmaise's reversal of pecking order and signal of high quality with equity contracts is attributable to the private investors having better information about the value of the project than the entrepreneur (i.e., the investor is more skilled and informed than the entrepreneur about the market value of the technology being financed), while in Myers and Majluf's model the investors are not as well informed as the entrepreneur.

<sup>3</sup> Because the definition of the term "venture capitalist" differs between the U.S. and Europe, we use the more generic term "private investors" (alternatively, one could use the more lengthy term "private equity investors").

<sup>4</sup> We are unable to control for certain factors that are considered by Brau *et al.* (2003). We do not have the requisite degrees of freedom (i.e., a large enough sample from each individual European country) to consider a plethora of firm-specific characteristics. We nevertheless provide some firm specific and industry controls, and show the robustness of the results pertaining to investor, market and governance characteristics when the controls are and are not considered.

<sup>5</sup> As well, it could be more difficult and more costly (in terms of direct costs as well as costs associated with underpricing) for entrepreneurial firms to go public in countries where they do not reside. If this were not the case, then the Legality index in the country of the entrepreneurial firm's domicile would obviously be a much less relevant factor. Cross border takeovers and IPO listings (across each of the European countries) were certainly in the feasible set of options for each of the private investors in the sample considered herein.

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Our discussions with the private investors indicated that while cross-border exits were possible, some difficulties (e.g., in terms of greater underpricing) could be experienced. In the sample herein, most exits were domestic; control variables for foreign exits were immaterial to the analysis, and therefore are not presented below (but are available upon request).

<sup>6</sup> The most notable institutional difference between Europe and the US, in terms of private investor contractual governance, is in the use of convertible securities. Tax considerations in the US give rise to the use of convertibles (Gilson and Schizer (2003)). Our surveys and interviews of the investors herein indicated tax was not a material consideration in the choice of contract structure. In support of this, it is noteworthy that each investor used various forms of finance, depending on the characteristics of the entrepreneurial firm. Given the US tax structure, a similar analysis of private investor governance among US investors is unlikely to yield similar conclusions, since US investors only use convertible securities (Gompers (1998), Kaplan and Stromberg (2001)). That there is heterogeneity among contract choices in this dataset renders the analysis herein relevant and interesting. In fact, to test the propositions herein, it is necessary to not use US data.

<sup>7</sup> Schwiabacher (2002) considers similar hand-collected data; however, those data are all aggregated and averaged for each private investor fund. In this dataset, there are massive variations within any given fund. No prior dataset matches entrepreneurial firm-specific governance with IPOs versus takeovers.

<sup>8</sup> Cestone (2002) argues that common equity with strong investor veto and control rights would give the investor too great an incentive to intervene in the entrepreneurial firm. Schindele (2003) argues that common equity is used to encourage *advice*, whereas convertible claims and contractual control rights tend to be used to facilitate *monitoring*. That we find common equity associated with few control rights and convertible preferred equity associated with more control rights is consistent with these models. As well, note that the data also comprise a few investments with mixes of debt and common equity or preferred and common equity. We do not make a distinction between these securities (with downside protection and upside potential) in the data and empirics as such distinctions were immaterial. We do not include more than 1 dummy variable for the security type in any given regression equation, as such variables are highly (negatively) collinear, which would bias the estimates. We also check for the effect of collinearity among the different contractual terms in the data by considering regressions with different right-hand-side variables.

<sup>9</sup> There were 3 IPOs for which the private investor still had shares for more than 1 year, and 4 takeovers for which the private investor received shares instead of cash. The entrepreneurs retained their

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stake in the IPO for at least a year after the IPOs, but invariably lost all control over the firm in the case of takeovers.

<sup>10</sup> These contingencies include contingent equity allocation dependent on financial performance, non-financial performance, taking certain actions, and sale of shares (see Kaplan and Stromberg (2000) for specific examples).

<sup>11</sup> Note that we do not use the year of investment dummies in the exit regressions, as these exit year dummies are correlated with the MSCI returns. Again, robustness is explicitly considered in section 5.

<sup>12</sup> Note that we exclude the convertible securities dummy variable (for obvious problems of exact collinearity). When the convertible securities variable is used, takeovers are more likely.

<sup>13</sup> Firm stages of development variables were excluded to avoid collinearity with the variable for investment size. Regressions with variables for stage of development did not materially impact the results of interest pertaining to private investor governance, and are available upon request.

<sup>14</sup> Note that the duration regression in Table V cannot include a constant term, as a Cox proportional hazard duration model is used. As well, note that the full sample of 223 observations was used for the market/book and duration regressions to account for the determinants of these variables, and to mitigate problems associated with inappropriate instruments. As well, the truncation of the dataset for the market/book and duration regressions would necessarily give rise to Heckman selection problems by only looking at successfully exited investments. Nevertheless, it is worth noting that the restricted dataset of only exited investments for these regressions did not yield materially different estimates.

<sup>15</sup> Similarly, Lowry and Schwert (2000) evidence the impact of adverse selection costs on the volume of IPOs.