Venture Capital in Spain by Stage of Development

by Tomás Ramón Pintado, Domingo García Pérez de Lema, and Howard Van Auken

This paper examines the investment decisions of 51 Spanish venture capital firms by stage of development. The results showed that venture capitalists ranked evaluation criteria related to the characteristics of the entrepreneurs, manager background, and management team experience as more important than market and product characteristics. Factors affecting the required rate of return were more important for the early-stage firms than for late-stage firms. Discounted cash flow analysis is the most frequently used valuation method. Private venture capital firms invest more during late development stages, while public venture capital firms invest more during the early stages. The results can be used by firms seeking venture capital, venture capital firms, consultants, and support agencies that provide capital-acquisition assistance. By gaining insight into decision criteria and processes, firms can develop better and more targeted materials to attract capital. Venture capital firms can use the information from this study to better understand their decision processes, individually and relative to competitors. Consultants and support agencies can use the information to provide better advice to both firms and venture capital firms. Information is this study could easily be built into training programs for both new and existing businesses. Finally, the results can also be incorporated directly into university courses that include material related to venture capital.

Introduction

Venture capital (VC) is important to many Spanish SMEs that are rapidly growing or that are developing high-risk products. Traditional financing sources are commonly unavailable as financial institutions are reluctant to provide risk capital and personal equity is often consumed during the early

Tomás Ramón Pintado is professor in the Department of Accounting and Finance at the Politechnical University of Cartagena and coordinator of SMEs.

Domingo García Pérez de Lema is head of The Department of Accounting and Finance at the Politechnical University of Cartagena and coordinator of SMEs Economic Observatory in the Murcia region of Spain.

Howard Van Auken is professor of management at Iowa State University.

Address correspondence to: Howard Van Auken, 3363 Gerdin Building, Iowa State University, Ames, IA 50011. Tel: (515) 294-2478. E-mail: vanauken@iastate.edu.

stages of company operations (Van Auken 2001). Venture capital can fund product development, marketing, expansion, turnaround, employee buyout, and acquisition. Venture capital investment can position the firm to obtain additional capital through the venture capitalist's experience, expanded network of contacts, enhanced market creditability, and stronger financial position (Ruhnka and Young 1997). Gupta and Sapienza (1994) suggest that venture capitalists add value to a firm by bringing investors and entrepreneurs together in an efficient manner, making better investment decisions than limited partners would make, and providing nonfinancial assistance that in turn promotes survival. Zacharakis and Meyer (2000) pointed out that VC-backed ventures have higher survival rates than nonVC-backed ventures.

Understanding the nature and process of VC investment decisions can improve the likelihood that a firm will be successful in raising funds. Stage of development, risk of the venture, background of the owners, geographic location, and exit opportunities affect the venture capitalists' assessment of risk and return potential (Van Auken 2001). Understanding these issues will enable companies to develop better proposals and negotiate more effectively with venture capitalists (Timmons and Spinelli 2004).

The creation of an active VC market that facilitates the financing of early-stage and high technology ventures has been a high priority for economic politics (Da Rin, Nicodano, and Sembenelli 2005). Early-stage companies that attract VC investment can take advantage of the VC's experience, knowledge, understanding of the entrepreneurial process, and network of relationships (Repullo and Suarez 2004; Lindsey 2003; Lerner 1995). Late-stage companies that attract VC capital have less opportunity to take advantage of these VC contributions (Michelacci and Suarez 2004).

The tendency of the VC in Europe in comparison with Asia countries and the United States is to invest in more in late-stage projects (Allen and Song 2003). This takes place in a higher intensity in Spain, where the investments in early stages only represented 4.2 percent of the invested volume and 21.9 percent of the number of operations in 2003 (ASCRI 2004). Spanish SMEs have traditionally experienced problems accessing medium and long-term financing. Public VC funds were established to provide funding for SMEs, particularly start-ups who could potentially contribute high added value. Regional governments are especially interested in establishing regional VC funds to promote regional economic development.

This paper fills a gap in VC research by examining VC investing in Spain. Specifically, the study examined the relationship between the stage of development and investment decisions of 51 Spanish VC firms. Little research has been completed on Spanish VC, especially on VC investing in relation to stage of firm development. Venture capital investing in Spain has increased fourfold since 1997, and much of this growth has been achieved through international capital inflows. In 1999–2000, the Spanish government developed economic initiatives to spur VC investing (Tejado 2003). Gaining insight into the decision criteria and processes of Spanish VC decisions can assist further development of government policy that facilitates VC investing. A better understanding of VC investing can help Spanish firms to develop better and more targeted materials to attract capital. Venture capital firms can use the information from this study to better understand their decision processes, both in isolation as well as in relation to their competitors.

The next section of the paper provides an overview of VC investing. Section 3 presents a description of the data and

methods used in data analysis. Section 4 explains the results of the analysis, and the final section provides summary results and conclusions.

Venture Capital Investments
Stage of Development

Lam (1991) recognized the importance of analyzing investments according to the stage of development by stating that VC investments relative to the stage of development provide important information on company value. Venture capital investment of capital is similar to buying an option to participate in the subsequent stages of company development. The company's stage of development directly impacts the VC's investment analysis, especially as related to the risk assessment and return potential (Carter and Van Auken 1994). Venture capitalists would require higher expected rates of return for early-stage investments as compared to late-stage investments due to the greater risk exposure.

Venture capitalists typically specialize by stage of development and geographical location. Specializing by stage of development allows them to balance investment risk, portfolio diversification, and return potential. Investing in specific geographical locations permits greater opportunity to influence and advise firms in which they invest (Cano and Cazorla 1998; Carter and Van Auken 1994; Barry 1994; Norton and Tenenbaum 1993). Gupta and Sapienza (1992) show that VC firms that specialized in the early stage of development prefer less diversification and close geographic proximity to the firms in which they invest than VC firms that invest in late stages. Larger VC firms often invest in multiple stages of development and a larger geographic area to manage risk exposure through diversification (Cano and Cazorla 1998).

Information

The flow of information between the venture capitalist and the entrepreneur is one of the more important elements affecting negotiations and investment. Several alternative approaches, including information asymmetry, signaling, and agency theory, have been used to understand the role of information in consummating the investment decision. Information asymmetry has been cited as one of the more important factors in the acquisition of capital by small firms (Landstrom 1992). Expecting the exchange of all knowledge about a venture is unrealistic, particularly in view of the specific knowledge embedded in the skills and capabilities of the founders. Asymmetrical information is greater in the early stages of development than in later stages because of the difficulty of assessing performance in earlier stages (Sahlman 1990). Information asymmetry is potentially an even greater problem for firms involved in technological innovation than other firms because of the uncertainty of market forecasts and long product development lead times (Van Auken 2001).

Even with a superior business concept and a competent team, new ventures are likely to be underfunded unless they can effectively communicate the appropriate information to potential investors (Busenitz, Fiet, and Moesel, 2005). Problems associated with information asymmetry can, however, be mitigated through interactions between the venture capitalist and the entrepreneur (Sapienza and Gupta 1994). The venture capitalists' due diligence of the investment proposal is an important step in minimizing information asymmetry (Gompers 1995). Several researchers (Admati and Pfleiderer 1994; Lerner 1994; Chan 1983) proposed models to overcome problems stemming from asymmetrical information.

The presence of asymmetric information is a fundamental assumption of signaling theory. In the absence of information, decision-makers often look to various indicators as signals of future outcomes. Information asymmetry may allow the entrepreneur to engage in opportunistic behavior that is inconsistent with the goals of the investor. One of the critical challenges for a new venture team is to provide signals to venture capitalists that overcome information asymmetry (Busenitz et al. 2005; Deeds, Decarolis, and Coombs 1997). Appropriate signals can allow new ventures to communicate both firm value and owner commitment to potential investors (Arthurs and Busenitz, 2003).

Agency problems can occur as the result of incongruent goals and different risk preferences between an owner and a venture capitalist (Arthurs and Busenitz 2003). Entrepreneurs may, for example, exaggerate the viability of the business to obtain favorable financing terms (Amit, Brander, and Zott 1998). Landstrom (1992) used agency theory to show that information asymmetry results in small firms having greater difficulty in raising capital because of higher monitoring costs, bonding costs, and residual loss potential, as compared to larger firms.

Quality and amount of information may depend on the firm's stage of development (Van Auken 2001). Both venture capitalists and entrepreneurs should recognize that agency problems and signaling issues may vary by stage of development. One method that venture capitalists often use to manage agency and signaling issues is that of specializing by stage of development (Cano and Cazorla 1998; Gupta and Sapienza 1992). Specialization allows them to develop and provide expanded networks and better understand their risk exposure (Carter and Van Auken 1994; Norton and Tenenbaum 1993).
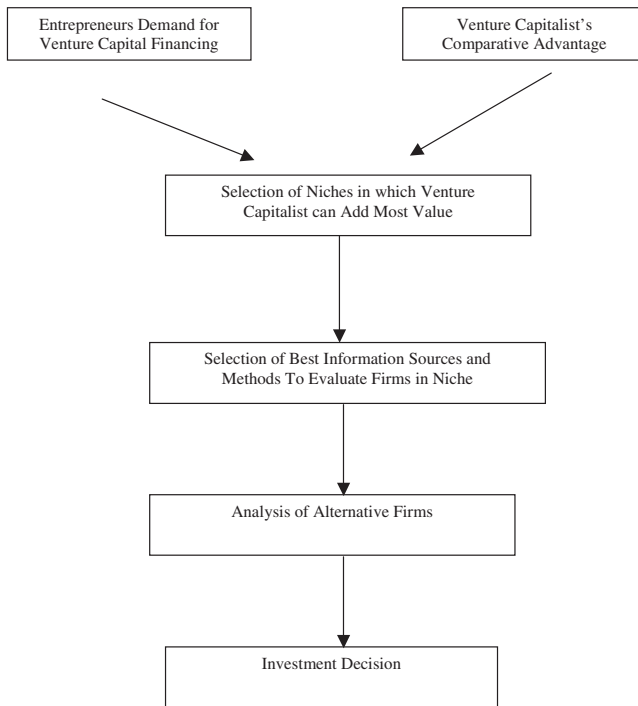
Proposal Evaluation

Several studies have examined due diligence of proposals (Fried and Hisrich 1994; MacMillan, Siegel, and Subbanarasimha 1985; Tyebjee and Bruno 1984). Due diligence assesses the impact on the venture's risk and return characteristics of issues related to the management team, product, market potential, and legal concerns (Manigart et al. 1998; Wright, Robbie, and Ennew 1997; Fried and Hisrich 1994). The valuation of proposals includes two distinct aspects. Deal origination, or the first contact between the owner and venture capitalist, is often arranged through financial mediators, and other venture capitalists. Due diligence of material in the business plan is a common initial aspect of deal origination. Deal screening, the next step in proposal evaluation, evaluates issues related to location, size, industry, and stage of development, to filter proposals that merit serious consideration. This evaluation often focuses on matters related to the quality of the company as well as the achievement of the venture capitalist's investment goals (Manigart et al. 2002; Wright and Robbie 1996; MacMillan, Siegel, and Subbanarasimha 1985; Tyebjee and Bruno 1984). Accounting information is an especially important evaluation tool of VC investments in Europe (Manigart, Wright, and Desbrières 1998).

Venture Capital Decision Process

Figure 1 shows the VC decision process and may provide insight into why venture capitalists specialize in particular niches and focus on specific sources/types of information. Selection of specific investments is the culmination of issues associated with both the market needs and venture capitalists skills. Venture capitalists will invest in market niches where they can add the most value to both their potential portfolio

Figure 1
Venture Capital Process

```
┌─────────────────────────┐         ┌─────────────────────────┐
│  Entrepreneurs Demand for│         │  Venture Capitalist's   │
│  Venture Capital Financing│        │  Comparative Advantage  │
└─────────────────────────┘         └─────────────────────────┘
              ↘                         ↙
          ┌───────────────────────────────────┐
          │  Selection of Niches in which Venture │
          │  Capitalist can Add Most Value    │
          └───────────────────────────────────┘
                          │
                          ↓
          ┌───────────────────────────────────┐
          │  Selection of Best Information Sources and │
          │  Methods To Evaluate Firms in Niche │
          └───────────────────────────────────┘
                          │
                          ↓
          ┌───────────────────────────────────┐
          │  Analysis of Alternative Firms    │
          └───────────────────────────────────┘
                          │
                          ↓
          ┌───────────────────────────────────┐
          │  Investment Decision              │
          └───────────────────────────────────┘
```

and the firm. Selection of the market niche is, however, predicated on the nature of market (for example, entrepreneur's demand for capital) and the venture capitalist's comparative advantage (Wright and Robbie 1998). The analysis of opportunities in different niches may require different types of information as well as different analytical methods (Harvey and Lusch 1995).

Venture capital financing may be viewed as an expensive funding solution to projects with high potential returns, but also substantial asymmetric information problems and potentially high agency costs (Timmons and Spinelli 2004; Landstrom 1992). Venture capitalists face numerous constraints, including limits on time, financial resources, and information. Venture capitalists would be expected to invest in market niches (for example, geographic, stage of development, and industry) and use information sources that produce the most gains given these constraints.

Private venture capitalists should consider at least two issues when selecting the desired market niche in which to specialize and invest. The first issue, deal flow, is related to the availability and quality of investment opportunities. The second, the comparative advantage of the venture capitalist, could be, for example, skills in evaluating unproven technologies, appraising market demand for new products, assessing the managerial talent of the entrepreneur, providing the advice and support needed to grow

the business rapidly, or other areas. Given the set of opportunities and their comparative advantage, the venture capitalist should invest in the niche(s) where they can add the most value (Wright, Robbie, and Ennew 1997). The importance of investing in high-technology firms is part of this market niche selection issue. Another aspect of the niche selection may be deciding whether to focus on early- or late-stage firms.

Once the VC firm identifies the market niche(s) where they can offer the most value and that provides that highest potential return on investment. The investment opportunities would subsequently be analyzed using the most useful tools and available information. If accurate information was costless and time constraints did not exist, then venture capitalists could evaluate all proposals. However, these conditions do not exist because information is costly and all information may not be revealed. Moreover, the time devoted to project analysis would limit the time to analyze other projects or advice existing firms in the venture capitalist's portfolio. Venture capitalists would be expected to select information sources and types of information that offer the greatest largest value in analyzing firms within their niche.

Methodology
Sample and Questionnaire

The sample consisted of the 63 firms registered in Asociación Española de Entidades de Capital-Riesgo (Spanish Association of VC Firms). A total of 51 usable questionnaires were returned, providing a response rate of 80.95 percent. A postal survey followed by telephone call was used to gather the data.

The questionnaire was developed and pretested in early 2001. A pretest of the questionnaire was completed by economists with experience in business valuation and financial risk and by venture capitalists with experience in project evaluation. Comments and suggestions resulting from the pretest were incorporated into the questionnaire as was necessary. Data were collected during March to June 2001.

The first section of the questionnaire collected information on the characteristics of the VC company and proposal evaluation. These questions included (1) type of VC company (VC firm, VC management company, regional/industrial development society, and other); (2) source of capital (private versus public); (3) amount of funds managed (<6 million euros, 6–15 million euros, 15–30 million euros, and >30 million euros); (4) average evaluation time for accepted proposal (<1 month, 1–3 months, 3–6 months, >6 months); (5) evaluation time for rejected proposal (<1 month, 1–3 months, 3–6 months, >6 months); and (6) percentage of rejected proposals (<30, 31–50, 51–80, and >80); (7) number of proposals received each year; and (8) percentage of investments during past three years by stage of development (seed, start-up, expansion, and maturity).

The next section of the questionnaire collected information on 12 aspects of proposal evaluation. Questions included (1) source of first contact (from the VC firm versus from the entrepreneur); (2) frequency (1–5 scale, 1 = never and 5 = always) of source of referral (venture capitalist's reputation, manager of another of VC company's investment, VC company's consultant, other VC's investor, VC's pursuit of new investment, state-owned company, other business person, financial institution, financing mediators, and other); (3) frequency of venture capitalist expectations during first contact (1–5 scale, 1 = never and 5 = always) (interview of owner, information on position of company within industry, business plan, management team resume, and other); (4) ranking of importance (1–5 Likert scale, 1 = not important and 5 = very important) of

factors affecting acceptance or rejection of proposal during initial screening (high technology company, viability of project, quality of management team, exit opportunity, stage of development, and geographic location); and (5) ranking of importance (1–5 Likert scale, 1 = not important and 5 = very important) of information sources that are used to evaluate proposals (financial press, interviews with other owners in the economic sector, interviews with company managers, interviews with other company personnel, government statistics, sales and market information, product information, other VC firms, external accountants or auditors, business plan cash flow projections, business plan situation analysis, business plan profits/losses, business plan global coherence, time schedule, and management team's resumes).

Additional questions in this section included: (6) required rate of return by stage of development; (7) ranking of importance (1–5 scale, 1 = not important and 5 = very important) of VC firm's financial requirements (minimum profitability independent of type of firm, minimum profitability depends on characteristics of investment, debt-to-equity ratio falls within standard limits, debt-to-equity ratio appropriate to project risk, and required return depends on nature of investment); (8) ranking of factors (1–5 scale, 1 = not important and 5 = very important) causing the VC firm to change target rate of return (expected time to exit, size of investment, industry conditions, economic conditions, changes in profitability of equity market, changes in profitability of debt market profitability, changes in interest rates, amount of expected from investment, industry/sector, geographic region, round of financing, preplanned exit); (9) ranking of importance (1–5 scale, 1 = not important and 5 = very important) of entrepreneur attributes (honest/integrity, management team, work experience,

knowledge of the sector, leadership skills, understanding of company objectives); (10) ranking of importance (1–5 scale, 1 = not important and 5 = very important) of product or services characteristics (proven product success, product's stage of life cycle, marketing strategy, high-tech product); (11) ranking of importance (1–5 scale, 1 = not important and 5 = very important) of market characteristics (target has high potential growth rate, company able to create a new market for product, high potential growth rate of potential clients, VC firm's experience in market); and (12) frequency of use (1–5 scale, 1 = never and 5 = always) of valuation methods (book value, replacement value, discounted future cash flows, price earnings ratio (historic basis), price earnings ratio (prospective basis), recent industry prices, and industry ratios).

Methodology

The data were initially summarized by use of univariate statistics (means and frequencies) to provide a better understanding of the respondents and characteristics of the responding companies. The sample was subsequently segmented into two categories: early-stage (seed and start-up phases) and late-stage firms (expansion, bridge, etc. phases). The early- and late-stage classification was used by Allen and Song (2003) and Da Rin, Nicodano, and Sembenelli (2005).

The nonparametric Mann–Whitney U-test and contingency tables were used to identify differences between the categories relative to stage of development. A nonparametric test was used because the assumption of normality of the population distribution may not be valid. Yates' correction for continuity was also used with the Pearson's chi-square test (tables matrices are 2 × 2).

The development of risk capital in Spain occurred in stages that could be characterized by a prevalence of public investments in companies that were in

the seed and start-up phases of development. Currently, private initiative is more important for companies in the mature stages of development, although the public initiative continues to be relatively important.

We are interested in analyzing the relationship between the stage of development and source of capital (private or public), size of funds managed, and high technology firm and geographic location. Two models using Wald's stepwise logistic regressions were used in the analyses. This method is used because the variables may not be normally distributed.

Model 1: $SD = a_0 + b_1CAP + b_2SIZE + e$
Model 2: $SD = a_0 + b_1HT + b_2GEO + e,$

where SD = Stage of development (0 = early-stage and 1 = late-stage)
CAP = Source of capital (0 = private and 1 = public)
SIZE = Amount of funds managed (1 = <6 million euros, 2 = 6–15 million euros, 3 = 15–30 million euros, and 4 = >30 million euros)
HT = High-technology business (1–5 scale, 1 = not important and 5 = important)
GEO = Geographic location (1–5 scale, 1 = not important and 5 = important).

Results
Characteristics of Firm and Fund
Table 1 provides background information on the VC firm and proposal evaluation. Approximately two-thirds of the firms obtained capital from private sources and the remaining one-third obtained capital from public funds. The first contact between the VC firm and entrepreneur was almost always (82 percent of the time) made by the VC firm. Over one-half (60.8 percent) of the VC firms evaluate more than 100 proposals per year. The majority of the VC firms respond relatively quickly to proposals. Approximately 56.9 percent of the firms respond in less than one month to pro-

posals that are rejected, while approximately 72 percent of the firms respond in less than three months to proposals that are accepted.

Table 1 also shows a comparison of the background information relative to firms that primarily invest in companies in early versus late stages of development. A significantly higher percentage of VC firms invest in later-stage companies than in early-stage companies, and the difference is statistically significant whether the VC funds come primarily from private or public sources. The table also shows significant differences between the percentage of proposals submitted by early- and late-stage firms relative to the number of proposals received each year by the VC firm. Firms receiving fewer than 100 proposals per year receive a significantly higher percentage of proposals from firms in the early stages of development than from firms in the late stages of development. Firms receiving more than 100 proposals per year receive a significantly higher percentage of proposals from firms in the late stage of development than from firms in the early stages of development. No other statistically significant differences between VC firm characteristics relative to stage of development are evident in the table.

Initial Contact between Venture Capital Firm and Entrepreneur
Table 2 shows the mean frequency of method through which the first contact is established between the VC firm and entrepreneurs. The two most frequent methods, the venture capitalist's search for new investments (mean = 3.37) and contacts through financing intermediaries (mean = 3.35), were the only two methods of contact with a mean frequency of use above 3.0. The two least frequent methods of establishing first contact are through state-owned companies (mean = 2.16) and the VC firm's work with other firms (mean = 2.34). All

Table 1
Comparisons of Characteristics of Venture Capital Firms:
Percentages and Chi-Square Tests of Significance (*n* = 51)

Variables	Percentage of Firms	Stage of Development	
		Early Stage	**Late Stage**
Source of Venture Capital			
Private Capital	66.7	14.7**	85.3**
Public Capital	33.3	33.3**	52.9**
Makes First Contact			
Venture Capital Firm	18.0	30.8	13.5
Entrepreneur	82.0	69.2	86.5
Number of Proposals per Year			
< 100	60.8	84.6*	52.6*
> 100	39.2	15.4*	47.4*
Average Time to Respond to			
a Rejected Proposal			
< 1 month	56.9	53.8	57.9
1–3 months	43.1	46.2	42.1
Average Time to Respond to			
an Accepted Proposal			
< 3 months	72.5	76.9	71.1
3–6 months	27.5	23.1	28.9

*Significant at 10 percent.
**Significant at 5 percent.
***Significant at 1 percent.

other methods clustered between means of 2.96 (other businessmen) and 2.52 (firm managers).

The rankings of two methods of establishing first contact differed significantly relative to stage of development of entrepreneur's firm. Financing intermediaries were used significantly more for the late stage of development firms, while state-owned companies were used significantly more for the early stage of development firms.

Importance of Venture Capitalists' Evaluation Criteria

Table 3 shows the evaluation criteria used by the venture capitalists in their initial screening of proposals. The top three criteria, each of which had a mean ranking above 4.0, were viability of project (mean = 4.94), quality of management team (mean = 4.88), and exit opportunity (mean = 4.29). The standard deviation (S.D.) of these criteria became smaller as the mean use became higher. This suggests greater consensus on the importance of the most important criteria than on those less important. The least important criteria were high technology (mean = 2.45), geographical location of firm (mean = 2.83), and firm's stage of development (mean = 3.55).

Table 3 also shows the mean rankings of importance of the evaluation criteria by stage of development. The relative rankings are generally similar in both

Table 2
Reasons for First Contact between Venture Capital Firm and Entrepreneur: Means and Standard Deviations (S.D.) of All Firms Mann–Whitney Test of Differences between Means by Stage of Development ($n = 51$)

Reason for Contact	All Firms		Stage of Development	
	Mean	S.D.	Early	Late
Venture Capital's Pursuit of New Investments	3.37	0.82	3.15	3.45
Financing Mediators	3.35	1.11	2.27***	3.66***
Other Businessmen	2.96	0.92	2.83	3.00
Referral from Financial Institution	2.90	1.05	2.83	2.92
Venture Capital Firm's Other Investment	2.71	1.05	2.27	2.84
Venture Capital's Consultants	2.69	0.85	2.45	2.76
Firm Managers	2.52	0.74	2.75	2.44
Venture Capitalist's Work with Other Firms	2.34	0.81	2.18	2.39
State-Owned Companies	2.16	1.09	2.83***	1.91***

*Significant at 10 percent.
**Significant at 5 percent.
***Significant at 1 percent.

Table 3
Ranking of Importance of Factors Affecting Evaluation of Initial Screening of Proposal Mean and Standard Deviation of All Firms and Mann–Whitney Test of Differences between Means by Stage of Development ($n = 51$)

Evaluation Criteria	All Firms		Stage of Development	
	Mean	S.D.	Early	Late
Viability of Project	4.94	0.24	4.83*	4.97*
Quality of Management Team	4.88	0.33	4.77	4.92
Exit Opportunity	4.29	0.87	4.00	4.38
Development Stage of Firm	3.55	0.79	3.46	3.58
Geographical Location of Firm	2.83	1.58	4.08***	2.37***
Project on High Technology	2.45	1.17	3.31***	2.14***

*Significant at 10 percent.
**Significant at 5 percent.
***Significant at 1 percent.

categories. The main difference is that geographic location is ranked as being much more important when the firm is in the early stage of development (mean = 4.08) than when it is in a later stage of development (mean = 2.37). Venture capitalists are probably more attentive to early-stage firms because of their greater risk of failure and therefore may prefer that early-stage firms be located in closer proximity.

Two other significant differences between early- and late-stage firms' evaluation criteria mean rankings of importance are evident in Table 3. The viability of the project is more important for late-stage firms (mean = 4.97) than for early-stage firms (mean = 4.83). Time to market, viability, and exit opportunities may be easier to assess and thus more relevant for late-stage firms. Also, the importance of the degree of technology is more important for early-stage (mean = 3.31) than for late-stage firms (mean = 2.14). Although relatively unimportant for both categories of firms, technology is more important for early-stage than for late-stage firms.

Sources of Information and Proposal Evaluation

Table 4 provides the venture capitalists' ranking of importance of information sources that are used for proposal evaluation. The table shows that all sources of information are ranked above 4.0 and are thus important to venture capitalists. The four most important sources of information used by venture capitalists are part of the business plan—coherence of strategy (mean = 4.92), profit and loss forecast (mean = 4.80), financial projections (mean = 4.76), and balance sheet forecast (mean = 4.75).

Table 4
Rating of Importance of Sources of Information Used for Proposal Evaluation Mean and Standard Deviation of All Firms and Mann–Whitney Test of Differences between Means by Stage of Development ($n = 51$)

Source of Information	All Firms		Stage of Development	
	Mean	S.D.	Early	Late
Coherence of Strategies	4.92	0.27	4.92	4.92
Profits and Loss Forecast	4.80	0.53	5.00*	4.74*
Financial Projections	4.76	0.51	4.92	4.71
Balance Sheet Forecast	4.75	0.59	4.92	4.68
Interviews with Company Manager	4.72	0.54	4.62	4.76
Management Team Experience	4.71	0.50	5.00**	4.61**
Product Information	4.51	0.67	4.54	4.50
Sales and Market Information	4.51	0.76	4.38	4.55
Projected Timeline	4.14	1.01	4.08	4.16

*Significant at 10 percent.
**Significant at 5 percent.
***Significant at 1 percent.

This finding supports the central importance of a good business plan when seeking VC. The sources of information ranked as being least important (but still ranked as important) were projected timeline (mean = 4.14), experience of the management team (mean = 4.71), sales and market information (mean = 4.51), and product information (mean = 4.51). The generally low standard deviations suggest relatively high agreement of the rankings among the venture capitalists.

Table 4 also reports means for rankings of importance of the sources of information for the evaluation of early- and late-stage companies. Mean rankings of importance are generally similar for the two types of companies. The most noticeable differences are that profits and losses from the business plan are a significantly (10 percent significance level) more important source of information for early-stage firms (mean = 5.00) than for late-stage firms (mean = 4.74). Additionally, the management team is a significantly more important source of information for early-stage (mean = 5.00) than for late-stage (mean = 4.61) firms. The significantly higher rankings of importance are likely a result of longer time to market and profitability for early-stage than for late-stage firms. Management experience is very importance in leading the firm through the development and market entry phases.

Assessment of Required Rate of Return

Table 5 provides a description of two aspects of the venture capitalists' assessment of required rate of return. Panel A shows venture capitalists' required rates of return on investment relative to stage of development. The results indicate that a higher percentage of venture capitalists require higher rates of return on investments in earlier stages than in later stages of development. Correspondingly, a higher percentage of VC firms require lower rates of return on investments in later stages of development. This result is consistent with financial theory that states that higher risk investments (for example, early-stage firms) should provide higher expected returns and that lower risk investments (for example, late-stage firms) should provide lower expected returns.

Panel B of Table 5 shows the mean ranking of importance of factors affecting venture capitalists' assessment of the required rate of return on proposed investments. All factors of evaluation were ranked relatively high (all above 3.0) in importance by the venture capitalists. The factor ranked highest in importance was that the minimum required return depends on the characteristics of the investment (mean = 4.20). This assessment suggests that the required return will vary relative to the general characteristics of the proposal. This finding may be consistent with Panel A in that a proposal with characteristics that suggest greater risk would likely have a higher required rate of return, whereas proposals with characteristics that suggest less risk would likely have a lower required rate of return. Notably, the two lowest-ranked factors are that the required rate of return does not depend on the characteristics of the proposal (mean = 3.20) and that the debt-to-equity depends on risk (mean = 3.14). The low rankings on these factors suggest that specific criteria are not as important as a general risk assessment during proposal review.

Panel B shows mean rankings by the firms' stage of development. The importance of proposal evaluation criteria is similar for both categories of firms. In most cases, however, factors affecting the required rate of return were more important for evaluating early-stage firms than late-stage firms. Two significant differences between early- and late-stage firms' assessment of factors affecting

Table 5
Required Rate of Return and Factors Affecting Required Rate of Return Relative to Stage of Development ($n = 51$)

Panel A: Required Rate of Return by Stage of Development Percentages and Chi-Square Tests of Significance

Required Return (percent)	All Firms		Stage of Development			
	Early Stage (percent)	Late Stage (percent)	Early (percent)		Late (percent)	
			Early-Stage Investments	Late-Stage Investments	Early-Stage Investments	Late-Stage Investments
< 15	12.2	8.5	27.3**	6.7**	20.0*	5.4*
15–25	12.2	57.4	18.2**	10.0**	80.0*	51.4*
26–35	19.5	29.8	36.4**	13.3**	0*	37.8*
> 35	56.1	4.3	18.2**	70.0**	0*	5.4*

Panel B: Factors Affecting Required Rate of Return Mean and Standard Deviation of All Firms and Mann–Whitney Test of Differences between Means by Stage of Development

Factor	All Firms		Stage of Development	
	Mean	S.D.	Early	Late
Depends on Characteristics of Investment	4.20	0.99	4.31	4.16
Debt-to-Equity Ratio Depends on Risk	3.92	1.04	4.38**	3.75**
Total Yield Depends on Investment	3.92	1.06	3.85	3.94
Does Not Depend on Characteristics of Investment	3.20	1.02	3.31	3.17
Debt-to-Equity Ratio within Standard Limits	3.14	1.22	3.85**	2.89**

*Significant at 10 percent.
**Significant at 5 percent.
***Significant at 1 percent.

required return are that (1) acceptable debt-to-equity ratio varies by risk being significantly more important in early-stage (mean = 4.38) than in late-stage firms (mean = 3.75), and (2) debt-to-equity ratio being within standard limits is significantly more important for early-stage (mean = 3.85) than late-stage (mean = 2.89) firms. These results suggest that proposal evaluation is dependent on venture characteristics, analysis of risk is more important in the early than the late stage of development, and debt levels impact the assessment of required rate of return.

Importance of Owner, Product, and Market

The venture capitalists' rankings of importance (overall and by stage of development) of criteria for owner, product, and market characteristics are shown in Table 6. All characteristics of the owner are ranked as being very

Table 6
Ranking of Importance of Characteristics of Owner, Product, and Market: Means and Standard Deviations of All Firms and Mann–Whitney Test of Differences between Means by Stage of Development ($n = 51$)

	All Firms		Stage of Development	
	Mean	S.D.	Early	Late
Owner				
Honesty and Integrity	4.84	0.37	4.85	4.84
Knowledge of the Sector	4.75	0.44	4.92*	4.68*
Work Experience	4.69	0.55	4.92*	4.61*
Management Team	4.49	0.58	4.46	4.50
Leadership Skills	4.42	0.67	4.42	4.42
Understands Company Objectives	4.36	0.66	4.46	4.32
Product				
Proven Product Success	4.44	0.76	4.31	4.49
Product's Stage of Life Cycle	4.14	0.74	4.38	4.06
Marketing Strategy	4.00	0.73	4.08	3.97
High-Tech Product	2.86	1.15	3.77***	2.53***
Market				
Target Market Has High Potential Growth Rate	4.45	0.58	4.62	4.39
Company Able to Create a New Market for Product	3.98	0.76	3.77	4.05
High Potential Growth Rate of Potential Clients	3.96	0.80	3.85	4.00
Venture Capital Firm's Experience in Market	3.39	0.98	3.00	3.53

  *Significant at 10 percent.
 **Significant at 5 percent.
***Significant at 1 percent.

important (honesty/integrity = 4.84, knowledge of the sector = 4.75, work experience = 4.69, management team = 4.49, leadership skills = 4.42, and understanding company objectives = 4.36). The relatively low S.D.s suggest high agreement among the respondents.

Three of the product characteristics ranked as important (proven product success = 4.44, product stage of life cycle = 4.14, and marketing strategy = 4.0) are also ranked relatively similarly. The relatively small and similar S.D.s of these rankings suggest consistency of ranking of importance among the respondents. The importance of the product being oriented toward high technology (mean = 2.86) was ranked considerably lower than other factors. Market issues related to the product are much more important than whether the product is oriented toward high technology.

Market-related factors are generally ranked as being less important than owner and product characteristics. The exception is "target market has high potential growth" (mean = 4.45). Market potential is directly related to future market demand, revenue forecasts, and, thus, profit potential. Due diligence of the proposal would be incomplete without assessing market potential. Ability to create a new market for the proposed product (mean = 3.98), high potential customer growth rate (mean = 3.96), and firm's market experience (mean = 3.39) are also important criteria when venture capitalists evaluate firms.

Table 6 also compares the mean rankings of the importance of owner, product, and market characteristics for the entire sample and by stage of development. The table shows that several of the mean rankings differ significantly according to stage of development. The importance of the product being ori-

ented toward high technology is significantly more important for investments in early-stage firms (mean = 3.77) than for late-stage firms (mean = 2.53). Although a much riskier investment, venture capitalists believe that investments in high technology are much more important for early-stage than for late-stage firms. Two owner characteristics (knowledge of the industrial sector and work experience) were weakly more significant for firms in the early stage than for those in the late stage of development. No other statistically significant differences were evident between the two categories of firms.

Methods Used to Value Entrepreneurial Firm

Table 7 shows how frequently seven company valuation methods were used. Discounted cash flow analysis, which is based on finance theory associated with a firm's risk and return characteristics, is

Table 7
Mean Ranking of Importance of Method Used to Value Company Means and Standard Deviations of All Firms and Mann–Whitney Test of Differences between Means by Stage of Development ($n = 51$)

	All Firms		Stage of Development	
	Mean	S.D.	Early	Late
Discounted Future Cash Flows	4.20	0.94	4.15	4.21
Price Earnings Ratio (Prospective Basis)	3.80	1.22	3.23*	4.00*
Recent Prices in Industry	3.72	1.09	3.00***	3.97***
Ratios Unique to Industry	3.68	1.24	2.92***	3.95***
Price Earnings Ratio (Historic Basis)	3.56	1.22	3.08*	3.74*
Book Value	2.62	1.41	3.23*	2.41*
Replacement Value	2.24	1.03	2.77*	2.06*

*Significant at 10 percent.
**Significant at 5 percent.
***Significant at 1 percent.

used most frequently (mean = 4.20). The frequency of use of four other methods (price earnings ratio—forecast values [3.80], recent prices in the industry [3.72], ratio analysis [3.68], and price earnings ratio—historical values [3.56]) were very similar. Book value [mean = 2.62] and replacement value [mean = 2.24] were used much less frequently.

A comparison of the frequency of use between early- and late-stage firms indicates several significant differences. Almost every difference between the two categories of firms shows that the valuation technique is used more frequently when the firm is in the later stage as opposed to the early stage of development. The only exception is that replacement value is used significantly less frequently when the firm is in the late rather than in the early stage of development. No significant difference is evident in the use of discount cash flow between the two categories of firms.

A Wilcoxin chi-square test evaluated differences between mean frequencies of use of valuation methods. The most significant findings from these tests (not presented in a table) are that discounted cash flow is used significantly more often (1 percent level of significance) and replacement value is used significantly less often (1–5 percent level of significance) than other valuation methods. Discounted cash flow is clearly favored, and replacement value is obviously not preferred to value firms.

Logistic Regression Analysis

Spearman correlations (shown in Table 8) between the independent variables were used to determine significant relationships between the variables. The correlation coefficients indicate a low relationship between the variables. Multicollinearity should, thus, not be a problem.

Table 8
Correlations and Significance (in Parentheses) among Type of Capital and Size (n = 51)

Variables	Type of Capital VC	Size VC
Type of VC	1.000	
Size of VC	−0.279 (0.048)	1.000

Correlations and Significance (in parentheses) among High-Technology Business and Geographic Location
(n = 51)

Variables	High-Technology Business	Geographic Location
High-Technology Business	1.000	
Geographic Location	0.356 (0.014)	1.000

Table 9 shows the results of the Logit regression analysis that examined the relationship between stage of development (dependent variable) and (1) VC characteristics (type of capital and size) (model 1), and (2) investment preferences (high-technology business and geographic location) (model 2). The joint significance of the variables is accepted by the likelihood and Hosmer and Lemeshow tests (model 1: χ^2 = 7.112; sig.: 0.212; model 2: χ^2 = 0.216; sig.: 0.898). The Cox and Snell R^2 and Nagelkerke R^2 also show good fit. In model 1, the results indicate that the coefficients for type of capital (−1.746) is significant

Table 9
Logit Regression Results: MODEL 1
Stage of Development versus Type of Capital and Size
(n = 51)

Independent Variables	Regression Coefficient	Wald	Significance	Exp (B)
Type of capital	−1.746	4.792	0.029	0.174
Size	0.954	8.147	0.004	2.597
Constant	0.910	0.466	0.495	2.484
Model Fit				
Omnibus Test of Model: χ^2 = 15.775			0.000	
−2 Log Likelihood = 42.126				
Cox and Snell R^2 = 0.266				
Nagelkerke R^2 = 0.392				
Hosmer—Lemeshow test: χ^2 = 7.112			0.212	
82.4 percent correct classification				

Logit Regression Results: MODEL 2
Stage of Development versus High-Tech and Geographical Situation (n = 51)

Independent Variables	Regression Coefficient	Wald	Significance	Exp (B)
High Tech	−1.802	4.943	0.026	0.165
Geographic Location	−1.840	5.088	0.024	0.159
Constant	2.559	13.465	0.000	12.926
Model Fit				
Omnibus Test of Model: χ^2 = 15.195			0.001	
−2 Log Likelihood = 40.238				
Cox and Snell R^2 = 0.276				
Nagelkerke R^2 = 0.399				
Hosmer—Lemeshow test: χ^2 = 0.216			0.898	
83.0 percent correct classification				

at 5 percent. The coefficient for size (0.954) is significant at 1 percent. Venture capital companies that invest more often in late-stage companies are mainly private and larger firms than those that invest primarily in early-stage companies. Model 2 results indicate that the coefficients for high-tech (−1.802) and geographic location (−1.840) are significant at 5 percent. Venture capital companies that invest more often in late-stage companies give less importance to the geographical localization and whether the company is high technology when valuing proposals than VC companies that invest more often in early-stage companies.

Conclusions

This study examined the investment decisions of a sample of 51 Spanish VC firms. More insight into decision criteria and processes can enable firms to develop more targeted strategies to attract VC and to aid VC firms to better understand investment decision processes. An important contribution of the study is the empirical evidence on the venture capitalists' decisions relative to firms' stage of development. The current Spanish venture market is heavily biased toward mature expansion-phase firms in traditional sectors, with little investment in technology-based start-ups (Tejado 2003). This lack of investment diversification may restrict future economic development and competitiveness.

The findings provided insight into several areas of the Spanish entrepreneur—VC relationship. Approximately two-thirds of the Spanish VC firms obtain capital from private sources. Over one-half evaluate more than 100 proposals per year. The majority of the Spanish VC firms respond quickly to proposals, while most invest in late-stage companies. Venture capital firms receiving fewer than 100 proposals per year

receive a higher proportion of proposals from early-stage companies, while VC firms receiving more than 100 proposals per year receive proportionately more proposals from late-stage companies. The top three criteria for evaluating proposals were viability of project, quality of management team, and exit opportunity. The relative importance of the rankings is generally similar for early- and late-stage companies. All sources of information used for proposal evaluation were ranked as being important for both categories of firms.

The first contact, typically initiated by the VC firm, most commonly occurred through the venture capitalist's search for new investments and through financing intermediaries. Financing intermediaries were used significantly more often to initiate contact with late-stage firms, while state-owned companies were used significantly more often to initiate contact with early-stage firms. Private VC firms invest more during the late development stages, while public VC firms invest more during the early stages. High technology and location are more important initial screening criteria for early VC firms than for late VC firms. Characteristics of the entrepreneur, manager background, and management team experience were consistently more important evaluation criteria than market and product characteristics.

Two finance-related issues that were examined in the study were expected rate of return and proposal valuation methods. The results showed that a higher percentage of VC firms required a higher rate of return on investment in early-stage than late-stage of development firms. This result is consistent with financial theory that states that high-risk investments (for example, early stage firms) should be associated with high expected returns and that low-risk investments (for example, late-stage

firms) should be associated with low expected returns (Timmons and Spinelli 2004). Evaluation factors affecting the required rate of return were generally ranked as being more important for early-stage than late-stage firms. Two significant differences between the assessments of early- and late-stage firms' expected return are that the acceptable debt-to-equity ratio and "debt-to-equity ratio being within standard limits" are more important in the analysis of early- than late-stage firms. This is consistent with proposal evaluation being dependent on the venture characteristics and with risk being a more important criterion in the early than in the late stages of development (Tyebjee and Bruno 1984). The valuation method used most often was discounted cash flow analysis. Logit regression analysis indicated that VC companies that invest more often in early-stage companies (1) are smaller and acquire resources from public organizations and (2) place greater emphasis on the geographic location and technological intensity than those that invest primarily in late-stage companies when evaluating a company.

The results can be used by government policymakers, firms seeking VC, VC firms, consultants, and support agencies that provide capital-acquisition assistance. A greater understanding of VC decision-making can assist in the development of government policies that promote VC investing. New government policies could promote investment diversification into industry segments not currently receiving high VC investments. Better insight into the decision processes of venture capitalists can enable firms to prepare better capital-acquisition strategies. The more comprehensive industry-wide perspective can enhance a VC firm's investment analysis policies and procedures. The greater insight into capital acquisition and investment analysis can enable consultants and support agencies to improve the advice they give to com-

panies and VC firms. Information is this study could easily be built into business training programs and be incorporated into university classes that include material related to VC.

The study has several limitations that provide avenues for potential future research. Because the sample was relatively small, future studies could include more firms. A larger sample size may allow comparison by type of investment, stage of development, or size of investment. Such a study could include empirical test to determine whether the relationships in Figure 1 are valid in various countries. The data were also collected at a single point in time. A longitudinal study could provide evidence on the changes in evaluation over time. Future studies could expand the scope of research to include postinvestment activities and could compare investment decisions among venture capitalists in Spain, the United States, and the United Kingdom.

References

Admati, A., and P. Pfleiderer (1994). "Robust Financial Contracting and the Role of Venture Capitalists," *Journal of Finance* 49, 371–402.

Allen, F. and W.L. Song (2003). "Venture Capital and Corporate Governance," The Warton Financial Institutions Center, Working Paper 03–05, University of Pennsylvania, Philadelphia, September.

Amit, R., J. Brander, and C. Zott (1998). "Why Do Venture Capital Firms Exist? Theory and Canadian Evidence," *Journal of Business Venturing* 13, 441–466.

Arthurs, J. and L. Busenitz (2003). "Theoretical Foundations of the Venture Capitalist/Entrepreneurs Relationship: Current Issues and Future Directions," *Entrepreneurship: Theory and Practice* 28(2), 145–162.

ASCRI (2004). *Capital Riesgo Y Private Equity En España*. Madrid: Asociación

Española De Entidades De Capital Riesgo.

Barry, C. (1994). "New Directions in Research on Venture Capital Finance," *Financial Management* 23(3), 3–15.

Busenitz, L., J. Fiet, and D. Moesel (2005). "Signaling in Venture Capitalist-New Venture Team Funding Decisions: Does It Indicate Long-Term Venture Outcomes?" *Entrepreneurship: Theory and Practice* 29(1), 1–12.

Cano, C., and L. Cazorla (1998). "El modelo andaluz de capital riesgo: situación actual y perspectivas. Una comparación a escala nacional," *Revista de Estudios Regionales* 51, 121–143.

Carter, R., and H. Van Auken (1994). "Venture Capital Firms' Preferences for Projects in Particular Stagesof Development," *Journal of Small Business Management* 32(1), 60–74.

Chan, Y. (1983). "On the Positive Role of Financial Intermediation in Allocation of Venture Capital in a Market with Imperfect Information," *The Journal of Finance* 38(5), 1543–1561.

Da Rin, M., G. Nicodano, and A. Sembenelli (2005). "Public Policy and the Creation of Active Venture Capital Markets," Working Paper Series n°. 430, January, European Central Bank, Madrid.

Deeds, D., D. Decarolis, and J. Coombs (1997). "The Impact of Firm-Specific Capabilities on the Amount of Capital Raised in a Initial Public Offering: Evidence from the Biotechnology Industry," *Journal of Business Venturing* 12, 31–46.

Fried, V., and R. Hisrich (1994). "Toward a Model of Venture Capital Investment Decision Making," *Financial Management* 23(3), 28–37.

Gompers, P. (1995). "Optimal Investment, Monitoring, and the Staging of Venture Capital," *Journal of Finance* 50(5), 1461–1489.

Gupta, A., and H. Sapienza (1994). "Determinants of Venture Capital Firms' Preferences Regarding the Industry Diversity and Geographic Scope of Their Investments," *Journal of Business Venturing* 7, 347–362.

Harvey, M., and R. Lusch (1995). "Expanding the Nature and Scope of Due Diligence," *Journal of Business Venturing* 10(1995), 5–21.

Lam, S. (1991). "Venture Capital Financing: A Conceptual Framework," *Journal of Business Finance and Accounting* 18(2), 137–149.

Landstrom, H. (1992). "The Relationship between Private Investors and Small Firms: An Agency Perspective," *Entrepreneurship and Regional Development* 9, 199–223.

Lerner, J. (1994). "The Syndication of Venture Capital Investments," *Financial Management* 23(3), 16–27.

——— (1995). "Venture capitalists and the oversight of private firms," *Journal of Finance* 50(1), 301–318.

Lindsey, L. (2003). "The Venture Capital Keiretsu Effect: An Empirical Analysis of Strategic Alliances Among Portfolio Firms," Mimeo, Stanford University.

Macmillan, I., R. Siegel, and P. Subbanarasimha (1985). "Criteria Used by Venture Capitalists to Evaluate New Venture Proposals," *Journal of Business Venturing* 1, 119–128.

Manigart, S., K. De Waele, M. Wright, K. Robbie, P. Desbrières, H. Sapienza, and A. Beekman (2002). "Determinants of Required Return in Venture Capital Investment: A Five-Country Study," *Journal of Business Venturing* 17, 291–312.

Manigart, S., M. Wright, K. Robbie, P. Desbrières, and K. De Waele (1998). "Venture Capitalists' Appraisal of Investment Projects: An Empirical European Study," *Entrepreneurship: Theory & Practice* 21(4), 29–43.

Michelacci, C., and J. Suarez (2004). "Business Creation and the Stock Market," *Review of Economic Studies* 71(2), 459–481.

Norton, E., and B. Tenenbaum (1993). "Specialization Versus Diversification as a Venture Capital Investment Strategy," *Journal of Business Venturing* 8, 431–442.

Repullo, R., and J. Suarez (2004). "Venture Capital Finance: A Security Design Approach," *Review of Finance* 8, 75–108.

Ruhnka, J., and J. Young (1997). "A Venture Capital Model of the Development Process for New Ventures," *Journal of Business Venturing* 12, 167–184.

Sahlman, W. (1990). "The Structure and Governance of Venture Capital Organizations," *Journal of Financial Economics* 27, 473–521.

Sapienza, H., and A. Gupta (1994). "Impact of Agency Risks and Task Uncertainty of Venture Capitalist-CEO Interaction," *Academy of Management Journal* 37(6), 1618–1632.

Tejado, R. (2003). "Venture Capital Policy Review: Spain," Working Paper 2003/18, Organization for Economic Cooperation and Development, Madrid.

Timmons, J., and S. Spinelli (2004). "New Venture Creation," 6th ed. Boston: Irwin McGraw-Hill.

Tyebjee, T., and A. Bruno (1984). "A Model of Venture Capitalist Investment Activity," *Management Science* 30, 1051–1066.

Van Auken, H. (2001). "Financing Small Technology-Based Companies: The Relationship between Familiarity with Capital and Ability to Price and Negotiate Investment," *Journal of Small Business Management* 30(3), 240–258.

Wright, M., and K. Robbie (1996). "Venture Capitalists, Unquoted Equity Investment Appraisal and the Role of Accounting Information," *Accounting and Business Research* 26(2), 153–168.

——— (1998). "Venture Capital and Private Equity: A Review and Synthesis," *Journal of Business Finance and Accounting* 25(5), 306–356.

Wright, M., K. Robbie, and C. Ennew (1997). "Venture Capitalists and Serial Entrepreneurs," *Journal of Business Venturing* 12(3), 161–249.

Zacharakis, A., and D. Meyer (2000). "The Potential of Actuarial Models Can They Improve the Venture Capital Investment Decision?" *Journal of Business Venturing* 15(4), 323–346.