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An International Comparison of the Valuation Methods and Techniques
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Abstract

Most research relating to various aspects of venture capital has been conducted in the US. More recently, research has been undertaken in the UK, Europe and Asia Pacific. This research has hinted that there are differences in how venture capitalists (VCs) operate and make decisions both within their own industry and across borders. Moreover, previous research suggests that using results obtained in one country and transferring it directly to another is dangerous. Results obtained from this study of Australian VCs indicate that there are significant differences between VCs operating in different countries in terms of their decision-making processes. An understanding of such differences is important to entrepreneurs seeking funding from venture capitalists across borders.

Key Words

venture capital, venture capitalist, decision making, appraisal

Introduction

The majority of the research carried out to date on the venture capital (VC) industry has been conducted in the US, which is considered to be a hotbed of VC activity. Little research has been undertaken to the same level in other countries for comparison purposes. An increasing number of researchers are beginning to undertake surveys in other countries as their respective VC industries mature. Most of this research has occurred in the UK or in continental Europe (Siskos & Zopounidis 1987; Dixon 1989; Riquelme & Rickards 1992; Manigart et al. 1997, 2000 and 2002; Muzyka, Birley & Leleux 1996; Boocock & Woods 1997). Other country studies include South Korea (Rah, Jung & Lee 1994), Canada (Knight 1994) and the Asia Pacific (Knight 1994; Norman 1989; Shepherd 1999).

This study considers whether there are differences in VC decision making from an international perspective. There have been only three research studies identified that address this issue. Manigart et al. (1997) extended the original study undertaken by Wright and Robbie (1996) in the UK. Research results comparing the UK with the Netherlands, Belgium and France concluded that there were indeed cross-cultural

differences in terms of the valuation methods and techniques used by VCs in each of these countries (Sapienza, Manigart & Vermeir 1996; Manigart et al. 1997).

Researchers have found significant differences across countries in valuation methods used, discount factors applied in the valuation methods, perceived levels of risk, the required level of return and the sources of information used in the valuation process (Manigart et al. 1997, 2000). It was concluded that these differences could be attributed to the institutional, legal and cultural environment and corporate governance systems in different countries (Manigart et al. 2000). The earlier study (Manigart et al. 1997) was extended to compare the countries in that study to the US (Manigart et al. 2000). This later, five-country study warned that it was not possible to generalise the results obtained from one country to another and that valuation methods and information used differed widely (Manigart et al. 2000).

Previous research did not specifically address where and why differences occurred. This study was developed specifically to build on the previous research and address where differences occurred and attempt to explain why they occurred.

Framework and Theoretical Perspective

Not all VCs are the same. Researchers have identified the existence of cross-country/cultural differences between VCs. Similarly, there are differences between VCs within countries. There appears to be significant heterogeneity within the VC industry (MacMillan, Siegal & Subba Narasimha 1985; Bygrave & Timmons 1992). Differences exist between VCs in terms of stage of interest, amount of assistance provided by VCs, geographic decisions, rates of return, industry specialisation (Elango et al. 1995; Manigart et al. 2002), adding value (mentoring) (Steier & Greenwood 1995; Sapienza, Manigart & Vermeir 1996; Manigart et al. 2000) and VC-entrepreneur relationship (Gorman & Sahlman 1989; Cable & Shane 1997). It has been suggested that these differences may be due to dominant corporate governance mechanisms and the VC industry development stage (Manigart et al. 2000). Understanding these differences between VCs is beneficial to the entrepreneur as it allows them to target their funding pitch in a way that is likely to be more acceptable to the target VC (Elango et al. 1995). Some of these differences can be attributed to the fact that VCs have chosen to do certain things in a certain way. That is, VCs choose the level of support and added value they are going to provide to an investee company. Some VCs choose to provide greater amounts of support and assistance while others choose to provide little or no support and assistance (MacMillan, Kulow & Khoylian 1988).

Other differences relate to policy issues adopted by VCs in regard to their investment strategies to ease moral hazards and adverse selection problems arising from agency risk. These key relationship issues manifest themselves in the following categories: (1) imposition of hurdle rates; (2) screening and evaluation of investments; (3) contract specification; (4) deal structure; and (5) monitoring and mentoring of investments (Bank of England 2001). Research evidence concludes that differences between VCs are attributed to some extent to the VC industry structure, relative importance of investment stages and VC type (Elango et al. 1995; Wright & Robbie 1998).

It has been found that various VCs will adopt different approaches within the five relationship categories described above. VC type can be categorised by their risk profiles (MacMillan, Siegal & Subba Narasimha 1985) or by investor classification, as independent, captive and public (Wright & Robbie 1996; Manigart et al. 2000). Moreover, it has been suggested that the VC industry in different countries has unique characteristics (Ooghe, Manigart & Fassin 1991) and that VC market maturity is associated with the entry of a greater variety of fund providers (Ooghe, Manigart & Fassin 1991).

Previous research has clearly indicated that there are differences across countries, between cultures and within the VC industry. Hence, making decisions in one country by drawing from research conclusions found in different countries and cultures is dangerous (Manigart et al. 2000). This study was designed to identify these differences between VCs and across different countries in the following areas:

1. Investment preferences of VCs
2. Risk indicators used by VCs to determine venture risk
3. Required rates of return by investment stage
4. Assessing target rates of return for each investment proposal
5. Factors that vary the required rate of return
6. Sources of information used by VCs in appraising new ventures
7. Valuation methods and techniques used by VCs in appraising new ventures
8. Comparison of methods used by VCs in making a final selection on a valuation

Research Methodology

A mail questionnaire was used as the research instrument with the aim of replicating previous research (Wright & Robbie 1996, Manigart et al. 1997, 2000) for comparison purposes. The questionnaire was based on similar criteria and wording used in the previous research (Wright & Robbie 1996; Manigart et al. 1997, 2000, 2002).

A pilot test of the research instrument (questionnaire) was also undertaken prior to mailing it out to potential respondents. After receiving feedback from the pilot test a number of minor modifications to the questionnaire were made. These modifications were minor and would not affect the data collection integrity associated with the research topic.

The questionnaire was mailed out to a total of 120 potential respondents in the Australian VC industry in October 2001. Potential respondents were identified from the Australian Venture Capital Guide 2001 and Pooled Development Fund Board 2001 List of Registered Pooled Development Funds. Of the total number of potential respondents, 38 completed the questionnaire, giving a response rate of 32 percent. This compared favourably with previous research undertaken in the US, UK, France, Netherlands and Belgium, which recorded response rates of 24 percent, 58 percent, 24 percent, 41 percent and 50 percent respectively (Manigart et al. 1997, 2000).

The questionnaire was addressed to senior managers of each VC firm in order to obtain a corporate view rather than an individual analyst's response. Of the total completed responses, 61 percent came from independent firms, 32 percent from 'captives' (subsidiaries of financial institutions or fund managers), and the remaining 7 percent from government agencies and others. In addition, of the total number of respondents, 42 percent were Australian Venture Capital Association Limited (AVCAL) members.

In order to test for sample bias, the sample data was compared to the data obtained for the VC population in Australia from AVCAL (Australian Venture Capital Guide 2001). A comparison was made between respondents and the total Australian VC population on investment stage, investment horizon, average investment size, average number of professional staff and average number of years operating in the VC industry. These comparisons indicated that there were no significant differences between the sample data and the population, suggesting no bias in the sample.

In order to determine any differences between the research data and the results obtained in previous research, a number of statistical tests were used depending upon availability of data in previous research. Statistical analysis was undertaken using the Mann-Whitney U test for differences between independent groups on a continuous measure when assuming that the distribution is not normal (parametric). Where applicable, one-way ANOVA was used to determine whether significant differences exist between the results obtained in this thesis and that from previous research in specified countries. Significant differences were recorded when $p < 0.05$ or less. In addition to one-way ANOVA, post hoc analysis (paired t-tests) was conducted, where applicable, to identify which country results were different to the results obtained for Australia. Significant differences were recorded when $p < 0.01$ or less. Where comparisons were made between two independent means, the test statistic used was the t-test where significant differences are recorded when $p < 0.05$ or less.

Research Results

The results are summarised under individual headings, which represent each of the research questions developed earlier.

Investment Preferences of VCs

The investment preference of a VC has a significant impact on how an investment opportunity is valued, what information is required to make a valuation, the level of shareholding for a commensurate equity investment, how risk is determined, the level of expected rate of return and the time horizon to exit. The preference of the data sample was for VCs to invest predominantly in the expansion/development stage and early expansion stage as measured by the mean and standard deviations. To a lesser extent, investment in seed and start-up stages was the next preference.

The survey results, when compared to previous research undertaken in Europe, indicate that there is a statistically significant difference between the means using

one-way ANOVA for investment preference between all countries. Table 1 summarises these results.

Paired t-tests were conducted between the means for Australia and each individual country to ascertain how the Australian data differed to that obtained in previous research. Australia and the UK had a similar preference for early-stage investments (seed/start up/early expansion) while Belgium ($p < 0.01$) did not share this preference. Australian VCs' preference for investments in the expansion/development stage was significantly different to that of the UK ($p < 0.001$), as was it for management buy-outs (MBOs) (UK $p < 0.001$; France $p < 0.001$; Netherlands $p < 0.01$) and management buy-ins (MBIs) (UK $p < 0.001$; France $p < 0.001$).

Table 1: Comparison of Investment Preferences between Australian VCs and European VCs

Investment Stage Mean (S.D.)	Australia ⁽¹⁾ (N = 38)	UK ⁽²⁾ (N = 66)	France ⁽²⁾ (N = 32)	Netherlands ⁽²⁾ (N = 24)	Belgium ⁽²⁾ (N = 14)
Seed/Start Up/Early Expansion					
- Investment preference***	2.76 (1.19)	3.3 (1.16)	2.1 (1.62)	1.9 (1.32)	2.3 (1.38) ^a
- Expected time horizon**	3.92 (1.89)	6.0 (2.02) ^b	4.5 (2.05)	6.9 (3.84) ^b	6.1 (1.53) ^b
Expansion/Development					
- Investment preference***	3.16 (1.32)	2.0 (0.89) ^b	3.5 (1.14)	3.7 (1.00)	4.0 (1.18)
- Expected time horizon**	4.00 (1.20)	4.8 (1.33)	4.9 (1.24) ^a	6.6 (3.85) ^b	6.4 (1.67) ^b
MBO					
- Investment preference***	2.08 (1.14)	3.3 (1.05) ^b	4.3 (1.33) ^b	3.0 (1.43) ^a	2.9 (1.61)
- Expected time horizon***	4.13 (0.72)	4.2 (1.49)	4.6 (1.20)	5.9 (3.54) ^a	5.9 (1.59) ^b
MBI					
- Investment preference***	2.03 (1.01)	3.1 (0.97) ^b	3.9 (1.37) ^b	2.5 (1.18)	2.7 (1.49)
- Expected time horizon***	4.17 (0.84)	4.3 (1.54)	4.7 (1.15)	6.1 (3.62) ^a	6.4 (1.38) ^b

(2) Manigart, S., Wright, M., Robbie, K., Desbrieres, P. & De Waele, K. 1997, 'Venture Capitalists' Appraisal of Investment Projects: An Empirical European Study', *Entrepreneurship Theory and Practice*, Summer, Table 1, p. 36.

Significance levels for one-way ANOVA, for differences between means * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Significance levels for Paired t-tests (post hoc) a= $p < 0.01$; b= $p < 0.001$

Source: (1) Developed from this research.

In addition, VCs operating in Australia have an expected time horizon shorter than that of other European countries. For early-stage investments, Australian VCs had significantly shorter time horizons compared to the UK ($p < 0.001$), Netherlands ($p < 0.001$) and Belgium ($p < 0.001$). However, no significant difference was recorded with France. Australian VCs also had shorter time horizons for investments in the expansion/development stage (UK $p < 0.01$; France $p < 0.01$; Netherlands $p < 0.001$; Belgium $p < 0.001$), MBOs (Netherlands $p < 0.01$; Belgium $p < 0.001$) and MBIs (Netherlands $p < 0.01$; Belgium $p < 0.001$).

Moreover, Australian VCs expect a shorter time horizon for 'seed/start up/early expansion' (mean = 3.92 years) than they do for other later stage investments (expansion/development mean = 4.00 years; MBO mean = 4.13 years; MBI mean = 4.17 years). This result is the opposite of European countries, except for Belgium. This is not an expected result as it is assumed that it will take longer for an early-stage investment to develop to the stage where a VC can exit the investment than in the case of later-stage investments, such as 'expansion/development', 'MBO' and 'MBI'. A possible conclusion drawn from this result is that unless an early-stage investment can meet the required rate of return within a time horizon, which is less than that for a later-stage investment, it will not be considered by Australian VCs.

Risk Indicators Used by VCs to Determine Venture Risk

Significant research has been undertaken in identifying the evaluation process used by VCs in the investment decision-making process (Wells 1974; Poindexter 1976; Tyebjee & Bruno 1984; MacMillan, Siegal & Subba Narasimha 1985; MacMillan, Zeman & Subba Narasimha 1987; Robinson 1987; Hall & Hofer 1993). These studies could only agree on the following criteria as being the most important factors in assessing a venture's risk: management skill and experience, venture team, product attributes, market size, market growth and expected return on investment. MacMillan, Zeman and Subba Narasimha (1987) identified two important factors, which determined a venture's eventual success or failure. These were the extent to which a venture was insulated from its competitors and the degree to which there is a demonstrated market acceptance of the product. This finding was further supported by a replication of MacMillan, Siegal and Subba Narasimha's (1985) study confirming VCs' focus on market acceptance compared to other criteria, such as financial considerations, potential returns and liquidity (Fried, Hisrich & Polonchek 1993).

Table 2 summarises the results for this research question and compares them to that obtained in previous research. One-way ANOVA was used to identify any differences between the means ($p < 0.05$ or less). The most important criterion for evaluating the riskiness of a venture identified by VCs in Australia was managerial skill of the management team. This supported the results obtained in previous research conducted in Europe.

Table 2: Criteria Used by VCs in Determining a Venture's Risk

Risk Criteria 1 = not important 5 = extremely important	Australia⁽¹⁾ Mean (S.D.) (N = 38)	UK⁽²⁾ Mean (S.D.) (N = 66)	France⁽²⁾ Mean (S.D.) (N = 32)	Belgium/ Netherlands⁽²⁾ Mean (S.D.) (N = 38)
Contribution by management in terms of their managerial skill	4.79 (0.47)	4.8 (0.53)	4.9 (0.25)	4.8 (0.58)
Nature of the product market of the company*	4.74 (0.45)	4.3 (0.80) ^a	4.5 (0.72) ^a	4.6 (0.64)
Financial contribution by management*	4.05 (0.77)	3.3 (1.09) ^b	3.9 (0.84)	3.5 (0.95) ^a
Expected time horizon to exit*	3.71 (0.84)	3.5 (0.93)	3.7 (0.93)	3.2 (1.11)
Expected time horizon to redemption of preference shares	3.27 (0.96)	3.0 (1.02)	2.7 (1.26)	2.5 (1.04) ^a
Expected participating dividend yield	2.76 (1.08)	2.5 (1.04)	2.6 (1.34)	2.6 (1.10)
Nature of the capital market**	2.32 (1.14)	2.6 (1.07)	2.3 (0.83)	1.9 (0.86)

- (2) Manigart, S., Wright, M., Robbie, K., Desbrieres, P. & De Waele, K. 1997, 'Venture Capitalists' Appraisal of Investment Projects: An Empirical European Study', *Entrepreneurship Theory and Practice*, Summer, Table 2, p. 38.

Significance levels for one-way ANOVA, for differences between means * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Significance levels for paired t-tests (post hoc) a= $p < 0.01$; b= $p < 0.001$

Source: (1) Developed from this research.

There also appeared to be in-country agreement as evidenced by the low standard deviations and the fact that there was no statistically significant difference between the means for each country analysed. This was followed by the financial contribution by management, which did have a significant level of difference ($p < 0.05$) and was more important to Australian VCs than to VCs in the UK and Europe. The expected time horizon to exit ($p < 0.05$) and nature of the capital market ($p < 0.01$) were the only other variables that recorded significant levels of difference. There appeared to be remarkable similarities between the results of this research and that obtained from the previous research in terms of the level of importance for each risk factor as expressed by their means. The focus on the non-financial factors in assessing risk may be due to the preference for later-stage investments (Ooghe, Manigart & Fassin 1991; Fried, Hisrich & Polonchek 1993; Gompers 1998).

To explore these differences further, post hoc analysis (paired t-tests; $p < 0.01$ or less) was conducted between the means for Australia and each individual country to ascertain how the Australian data differed to that obtained in other countries. Australian VCs placed greater importance on the nature of the product market of the company than the UK VCs did ($p < 0.01$). Australian VCs also placed greater importance on the financial contribution by management (UK $p < 0.001$; Belgium/Netherlands $p < 0.01$), and expected time horizon to redemption of preference shares (Belgium/Netherlands $p < 0.01$).

There appeared to be considerable agreement between this study's results and that obtained in previous research in terms of the relative importance placed on various risk factors used by VCs in determining a venture's level of risk. The survey results appeared to be in the same rank order given to each risk factor by respondents in each country. The only differences appeared to be that Australian VCs placed greater importance on the nature of the product market of the company, financial contribution by management, and expected time horizon to redemption of preference shares, when these results were compared individually to each country.

Required Rates of Return by Investment Stage

One of the most important risk indicators used by VCs for assigning a perceived level of risk and hence the required rate of return, is the investment stage (Plummer 1987a and 1987b; Wright & Robbie 1996; Manigart et al. 1997; Golis 1998). Furthermore, finance theory states that a return an investor requires is a function of the investment's non-diversifiable risk (Brealey and Myers 1981; Sahlman 1990). However, due to the extreme uncertainty associated with VC investments, VCs do not use discount rates derived from finance theory (Poindexter 1976; Tyebjee & Bruno 1984; Plummer 1987b; Manigart et al. 1997). Notwithstanding these difficulties, researchers and practitioners agree that there is a relationship between perceived risk and return

(McNamara & Bromiley 1999). Little research has been undertaken on how different risk factors affect the rates of return required by VCs (Keeley & Turki 1993; Wright & Robbie 1996; Manigart et al. 1997).

VCs require higher rates of return for early-stage investments (seed, start up and early expansion) and lower rates of return for investments in later stages (expansion/development, MBO, MBI, pre-listing and IPOs) (Plummer 1987b; Bygrave & Timmons 1992; Fried, Hisrich & Polonchek 1993; Keeley & Turki 1993; Bank of England 2001). Table 3 summarises the results obtained from this study compared to that from previous research. The target rates of return are ex ante, that is, they are the rates of return hoped for, and not the actual rates of return achieved on exit (ex post).

Table 3: Required Rates of Return by Investment Stage*

Investment Stage (Median)	Australia ⁽¹⁾ (N = 38)	USA ⁽²⁾ (N = 300)	UK ⁽³⁾ (N = 66)	France ⁽³⁾ (N = 32)	Belgium/ Netherlands ⁽³⁾ (N = 38)
Overall (all investment stages)	43.2%	43%	30%	25%	15%
Early stage (seed/start up/early expansion)	46.7%	48%	50.5%	45.5%	33%
Expansion/development	45%	41%	28%	23%	23%
MBO	25%	n.a.	33%	28%	23%
MBI	n.a.	n.a.	38%	28%	23%
Pre-listing	35%	n.a.	n.a.	n.a.	n.a.
IPO	35%	30%	n.a.	n.a.	n.a.

(2) Plummer, J. 1987 'QED Report on Venture Capital Financial Analysis', QED Research Inc. Data devised from pp. 1-18.

(3) Manigart, S., Wright, M., Robbie, K., Desbrieres, P. & De Waele, K. 1997, 'Venture Capitalists' Appraisal of Investment Projects: An Empirical European Study', Entrepreneurship Theory and Practice, Summer, Table 2, p. 38.

• Average Rates of Return for each country by investment stage

n.a. Data not available

Source: (1) Developed from this research.

The required rate of returns for Australia and the US are virtually identical. The ex ante returns for both Australia and the US are considerably higher than that required by European countries. The overall rate of return required by Australian and US VCs (43%) is much higher than that required by VCs in the UK (30%), France (25%) and Belgium/Netherlands (15%). Statistical tests for differences between the data in Table 3 could not be undertaken due to insufficient data being reported in the previous research.

The higher returns required by Australian and US VCs could be due to a number of reasons. Both these countries may place greater importance on finance theory or apply knowledge gained from academic study more readily than their European counterparts. It has been suggested that higher returns are required for a less-

diversified portfolio than for a well-diversified portfolio (Norton & Tenenbaum 1993). Australian VCs prefer to specialise by investment stage and industry sector. This preference ultimately results in a less-diversified investment portfolio which, in turn, does not allow for diversification of unsystematic risk, hence the requirement for a higher return by the VC. The fact that both Europe and Australia include MBO and MBI in their definition of VC, which is in stark contrast to the US, allows VCs in Australia and Europe an opportunity to diversify risk. Conventional VC wisdom suggests that early-stage investments are more risky than later-stage investments. However, there still remains some confusion as to whether this relationship holds true (Keeley and Turki 1993; Elango et al. 1995; Manigart et al. 2002).

Assessing Target Rates of Return for Each Investment Proposal

To gain a better understanding of the required rates of return, a follow-on question sought to identify the factors that influence the rates of return required by VCs. These results are presented in Table 4. VCs preferred to use a flexible approach in assigning target rates of return by assessing individual characteristics of each investment proposal rather than for an investment to meet a standard benchmark rate of return.

Table 4: Assessing Target Rate of Return for Each Investment Proposal

Factor 1 = irrelevant 5 = essential	Australia ⁽¹⁾ Mean (S.D.) (N = 38)	UK ⁽²⁾ Mean (S.D.) (N = 66)
We require an investment to meet a specific required rate of return (IRR) according to the characteristics of each investment	3.87 (1.38)	3.64 (1.22)
We require a rate of return which yields a total cash return commensurate with the amount invested	3.66 (1.26)	3.38 (1.32)
We require the funding structure to meet gearing ratios/leverage ratios appropriate to each investment	3.18 (1.50)	2.41 (1.07) ^b
The investment is required to meet a standard required rate of return (IRR) regardless of investee company risk profile	3.05 (1.61)	2.27 (1.13) ^b

(2) Wright, M. & Robbie, K. 1996, 'Venture Capitalists, Unquoted Equity Investment Appraisal and the role of Accounting Information, Accounting and Business Research, vol. 26, no. 2, Table 6, p. 160.

Significance levels a = p < 0.05; b = p < 0.01; c = p < 0.001 (t-test comparing difference in means between Australia and the UK)

Source: (1) Developed from this research.

Secondly, VCs prefer the rate of return to be commensurate with the cash amount invested. There is no significant difference between the results obtained in this study and that obtained in the UK for these two variables using a t-test. However, the last two variables in Table 4 did indicate a difference between the results obtained in Australia and those obtained in the UK. Australian VCs prefer an investment to meet gearing ratios and a required rate of return (benchmark) regardless of its risk profile

than do their counterparts in the UK ($p < 0.01$). Australian VCs also required an investment to meet a standard required rate of return (IRR) regardless of investee company risk profile than did their counterparts in the UK ($p < 0.01$). Why there is a significant difference between the two results for these two variables cannot be explained. This further highlights the fact that there are cross-country differences between VCs.

Various researchers have proposed that VCs develop a composite rate of return made up of factors other than those identified in Table 4 (Manigart et al. 2002). It has been further suggested that VCs were much more involved in the day-to-day management of their investments, especially those in early-stage development than for investments in later stages (MacMillan, Kulow & Khoylian 1988; Gorman & Sahlman 1989; Sahlman 1990; Bygrave & Timmons 1992; Sapienza 1992; Steier & Greenwood 1995; Fried & Hisrich 1994; Sapienza, Manigart & Vermeir 1996; Cable & Shane 1997). However, this relationship between heavier VC involvement in early-investment stages was not supported by other researchers (MacMillan et al. 1988; Elango et al. 1995).

Factors that Vary the Required Rate of Return

Finance theory posits a positive relationship between the expected rate of return and the perceived level of risk associated with an investment (Brealey & Myers 1981). In addition, finance theory states that it is only the systematic risk that cannot be diversified away whereas the unsystematic risk is diversifiable (Higgins 1977). Of interest is how VCs determine target rates of return for each investment and whether this is in accordance with finance theory. This survey identified 'market conditions', 'degree of added value', 'actual cash amount invested', 'actual cash amount sought from an investment' and 'general economic conditions' as the key variables that determined their required rates of return. A comparison (t-test; $p < 0.05$ or less) with previous research in the UK is shown in Table 5 and indicates that there was a significant difference in the results for the actual cash amount invested ($p < 0.05$) and the geographic region of an investment ($p < 0.01$). Australian VCs rated these two variables higher than their UK counterparts did. Clearly, there are significant cross-country differences between VCs.

Table 5: Factors that Vary the Required Rate of Return

Factor 1 = never 5 = almost always	Australia Mean (S.D.) (N = 38)	UK Mean (S.D.) (N = 66)
The actual cash amount invested in a particular proposal (ie size of proposal) *	3.41 (1.21)	2.81 (1.08) ^a
The geographic region of the investment*	2.73 (1.35)	2.06 (1.11) ^b

(2) Wright, M. & Robbie, K. 1996, 'Venture Capitalists, Unquoted Equity Investment Appraisal and the Role of Accounting Information, Accounting and Business Research, vol. 26, no. 2, Table 7, p. 161.

Significant difference between the means a = $p < 0.05$; b = $p < 0.01$; c = $p < 0.001$ (t-test comparing means between Australia and the UK)

Source: (1) Developed from this research.

The significant difference between the two studies for geographic region could be due to the relatively large distances between major cities and regional centres in Australia compared to the UK. Differences relating to the actual amount invested may be attributable to differences in the average VC fund size and/or access to follow-on capital. Research data did not provide a clear explanation for these differences.

Factors seen by VCs as less important as determinants of rates of return were quoted equities, changes in long-term government bonds, and changes in base rates. This supported the findings from previous research, which indicate that VCs do not adopt the principles associated with finance theory, especially the Capital Asset Pricing Model (CAPM), in determining risk and return. Therefore, using the CAPM as a theoretical framework for explaining risk and return as it relates to VC is inappropriate (Poindexter 1976).

Sources of Information Used by VCs in Appraising a New Venture

Investment bankers, equity investment analysts, valuation professionals, corporate finance executives and advisers must all value a prospective investment prior to making or recommending an investment decision (Plummer 1987b; DeAngelo 1990; Pike, Meerjanssen & Chadwick 1993; Kaplan & Ruback 1995; Wright & Robbie 1996; Manigart et al. 1997, 2000; Kim & Ritter 1999; Pratt, Reilly & Schweih 2000). The information requirements for making a valuation may be different for those investing in their own right compared to those who act as advisers to others (Arnold & Moizer 1984). VCs can be considered to be in a unique position as their investments are likely to be in businesses that may not have a track record of sales, revenue and/or profits (Manigart et al. 1997). Therefore, information sources and data reliability is of paramount concern for VCs. Valuations are not required until a proposal has gone through the evaluation stage without rejection (Fried & Hisrich 1994; Steier & Greenwood 1995; Mason & Harrison 1996; Boocock & Woods 1997).

The results obtained in this study conclude that the most important sources of information are a VC's own due diligence report, the overall coherence of the business plan, product information, sales and marketing information, business plan profit and loss account, production capacity/technical information and proposed exit timing and method. The least important sources of information are financial press, trade journals, government industry statistics, statistical and information services, and other VCs. Clearly, these results indicate the use of both financial and non-financial information. A comparison was made between the results presented in this study and those from previous research. The results are shown in Table 6 using one-way ANOVA ($p < 0.05$ or less) to compare differences between means.

Table 6: Sources of Information Used by VCs in the Valuation Process

Source of Information 1 = no influence 5 = vital influence	Australia ⁽¹⁾ Rank-Mean (S.D.) (N = 38)	USA ⁽²⁾ Rank-Mean (S.D.) (N = 73)	UK ⁽²⁾ Rank-Mean (S.D.) (N = 66)	France ⁽²⁾ Rank-Mean (S.D.) (N = 32)	Belgium/ Netherlands ⁽²⁾ Rank-Mean (S.D.) (N = 38)
Own due diligence report *	1 – 4.71 (0.73)	1 – 4.88 (0.75)	1 – 4.47 (0.75)	2 – 4.57 (0.63)	1 – 4.61 (0.64)
Business Plan – Overall coherence of the business plan ***	2 – 4.53 (0.69)	3 – 4.19 (0.85)	3 – 4.06 (1.06)	1 – 4.77 (0.50)	3 – 4.47 (0.60)
Interviews with entrepreneurs ***	3 – 4.45 (0.92)	2 – 4.22 (1.09)	3.65 (1.14) ^b	7 – 4.25 (1.05)	3 – 4.47 (0.92)
Product information **	4 – 4.24 (0.68)	5 – 3.89 (0.83)	3.47 (1.00) ^b	4 – 4.41 (0.67)	7 – 4.11 (0.76)
Sales and marketing information **	5 – 4.21 (0.87)	5 – 3.89 (0.83)	7 – 3.80 (0.88)	4.25 (0.72)	5 – 4.24 (0.68)
Business Plan – Profit and Loss Account ***	6 – 4.18 (0.93)	7 – 3.81 (0.97)	2 – 4.36 (0.92)	5 – 4.38 (0.94)	2 – 4.48 (0.60)
Production capacity/technical information ***	7 – 4.03 (1.05)	3.71 (0.90)	3.42 (0.95) ^a	4.19 (0.69)	3.71 (0.73)
Proposed exit timing and method	8 – 4.00 (0.93)	3.64 (0.91)	3.70 (1.08)	3.68 (1.05)	3.34 (1.17) ^a
Curriculum vitae of management *	3.92 (1.08)	4 – 4.19 (0.88)	6 – 3.91 (1.06)	4 – 4.41 (0.84)	4 – 4.34 (0.75)
Interviews with other company personnel ***	3.84 (0.86)	8 – 3.74 (0.99)	3.17 (1.30) ^a	7 – 4.25 (0.95)	4.00 (0.96)
Business Plan – Balance Sheet ***	3.76 (1.2)	3.42 (1.04)	5 – 4.00 (1.05)	8 – 4.31 (0.97)	6 – 4.26 (0.80)
Business Plan – Unaudited management projections (more than 1 year ahead) ***	3.76 (1.15)	3.27 (1.17)	3.63 (1.02)	6 – 4.36 (1.05)	4.03 (1.05)

Source of Information 1 = no influence 5 = vital influence	Australia ⁽¹⁾ Rank-Mean (S.D.) (N = 38)	USA ⁽²⁾ Rank-Mean (S.D.) (N = 73)	UK ⁽²⁾ Rank-Mean (S.D.) (N = 66)	France ⁽²⁾ Rank-Mean (S.D.) (N = 32)	Belgium/ Netherlands ⁽²⁾ Rank-Mean (S.D.) (N = 38)
Business Plan – Unaudited management projections (1 year ahead) ***	3.66 (1.15)	3.4 (1.21)	4 – 4.03 (0.91)	2 – 4.57 (0.62) ^b	8 – 4.08 (0.91)
Business plan – Unaudited 'latest period' financial statements	3.63 (1.08)	3.51 (1.14)	5 – 4.00 (0.99)	3.79 (1.15)	3.95 (0.90)
Due diligence by accounting/consulting firms	3.53 (1.27)	6 – 3.82 (0.70)	8 – 3.75 (1.17)	4.03 (0.98) ^b	4.03 (0.92)
Business Plan – Unqualified audit report	3.5 (1.22)	3.25 (1.18)	3.45 (1.22)	3.61 (1.12)	3.61 (1.05)
Business plan – Qualified audit report ***	3.32 (1.38)	3.41 (1.21)	3.70 (1.25)	3 – 4.44 (0.67) ^b	4.21 (0.74) ^b
Other venture capitalists	2.95 (1.14)	3.32 (1.05)	2.82 (1.05)	3.06 (0.84)	3.00 (0.87)
Statistical and information services	2.71 (0.98)	n.a.	2.77 (1.04)	2.83 (1.05)	2.63 (0.79)
Government industry statistics	2.55 (0.89)	2.25 (0.87)	2.27 (1.00)	2.59 (0.95)	2.55 (0.95)
Trade journals	2.5 (1.03)	2.79 (1.00)	2.69 (1.09)	2.71 (0.86)	2.51 (0.99)
Financial press	2.08 (0.78)	2.19 (0.94)	3.03 (1.19)	2.65 (0.84)	(1.07)

(2) Manigart, S., De Waele, K., Wright, M., Robbie, K., Desbrieres, P., Sapienza, H. & Beekman, A. 2000, 'Venture Capitalists, Investment Appraisal and Accounting Information: A Comparative Study of the US, UK, France, Belgium and Holland, European Financial Management, September, Table 5, p. 399.

Significance levels for one-way ANOVA, for differences between means * p< 0.05; ** p< 0.01; *** p< 0.001

Significance levels for paired t-tests (post hoc) a= p< 0.01; b= p< 0.001

Source: (1) Developed from this research.

There were significant differences ($p < 0.001$) across the five countries for overall coherence of the business plan, interviews with entrepreneurs, product information, business plan profit and loss, production/technical information, interviews with company personnel, business plan balance sheet, business plan unaudited management projections (more than one year ahead), business plan unaudited management projections (one year ahead), and business plan qualified audit report. The differences appear to lie in the UK and Europe VCs being more concerned with information contained in the business plan, specifically financial information, than the US and Australian VCs. The latter placed more emphasis on product, sales and marketing information. In fact, Australia appeared to mimic, to a large extent, the results obtained in the US. This is not altogether surprising considering the close business, commercial and academic relationships that exist between the US and Australia. Secondly, the US is renowned for being a hotbed of VC activity, with many VC managers in Australia having had experience in the US prior to operating in Australia.

On the other hand, Europe and the US appear to be more concerned than Australia and the UK with the 'curriculum vitae of management'. European countries are more concerned with the business plan and its financial information than Australia, the US and UK. This is consistent with previous research which found that European countries are more financially orientated while Anglo-Saxon VCs are more business orientated (Sapienza, Manigart & Vermeir 1996; Manigart et al. 2000).

A surprising result was that Australian VCs place far greater importance on production/technical information and proposed exit timing and method than their counterparts in other countries do. This difference may be due to Australia's relatively small population and small production base necessitating a well thought out production/manufacturing plan (Ferris 2001). It may also be due to Australian VCs' preference for later-stage investments.

The differences noted above could be attributed to social and cultural factors, corporate governance, corporate systems, and the relative maturity of the VC industry in each country (Manigart et al. 1997). Manigart et al. (2000) suggest less mature VC markets favour a more financial orientation. However, while Australia is classified as having an immature VC market, the evidence suggests that Australian VCs place less emphasis on the financial aspects of a proposal similar to VCs in the UK and US. This could be due to the stronger Anglo-Saxon heritage and business and commercial relationships developed between these three countries over many years.

Paired t-tests were conducted on the data appearing in Table 6 to identify where the Australian results were significantly different to other countries ($p < 0.01$ or less). Differences to the UK were found in interviews with entrepreneurs ($p < 0.001$), product information ($p < 0.001$), production capacity/technical information ($p < 0.01$), and interviews with other company personnel ($p < 0.01$). There appear to be greater differences between Australia and the UK than between Australia and the US. No significant differences were recorded ($p < 0.01$ or less) between Australia and the US.

France, on the other hand, placed greater importance on the business plan unaudited management projections (one year ahead) ($p < 0.001$), due diligence by accounting/consulting firms ($p < 0.001$) and business plan qualified audit report ($p < 0.001$). This suggests that France places more importance on qualified audit reports and due diligence undertaken by third parties than their counterparts in Australia do.

The only significant difference recorded between Australia and Belgium/Netherlands was with business plan qualified audit report ($p < 0.001$).

Valuation Methods and Techniques Used by VCs in Appraising New Ventures

Placing a fair value on a new venture can be difficult, especially when it has no history of sales, non-existing turnover, no history of profits and negative free cash flow (Timmons 1994; Lerner 2000). The majority of valuation methods have been developed for entities that have a history of sales and profitability and the propensity to either be subject to the capital markets or, at the very least, be comparable to similar businesses. Because of these limitations VCs have developed various valuation methods that do not comply with existing finance theory-based valuation

methods and techniques. Conversations with survey respondents provided verbal evidence that some VCs find it beneficial to perpetuate the uncertainty and difficulty associated with the appraisal process, which can increase the likelihood of receipt of increased capital gains.

In addressing this research problem it was found that VCs use a wide range of valuation methods and techniques. The study results were compared with that obtained in previous research using one-way ANOVA comparing the difference in means, as shown in Table 7.

Table 7: Comparison of Valuation Methods and Techniques Used by VCs in Australia, US, UK and Europe

Valuation Method 1 = almost never 5 = almost always	Australia ⁽¹⁾ Rank-Mean (S.D.) (N = 38)	US ⁽²⁾ Rank-Mean (S.D.) (N = 73)	UK ⁽²⁾ Rank-Mean (S.D.) (N = 66)	France ⁽²⁾ Rank-Mean (S.D.) (N = 32)	Belgium/ Netherlands ⁽²⁾ Rank-Mean (S.D.) (N = 38)
Apply various scenarios (pessimistic, optimistic, most likely)	1 – 4.08 (1.14)	n.a.	n.a.	n.a.	n.a.
Capitalised maintainable earnings (EBIT multiple)	2 – 3.65 (1.44)	1 – 3.83 (1.06)	3 – 3.90 (1.23)	6 – 3.66 (1.12)	2 – 3.76 (1.13)
Capitalised maintainable earnings (EBITDA multiple)	3 – 3.65 (1.36)	n.a.	n.a.	n.a.	n.a.
Recent transaction prices for acquisitions in the sector	4 – 3.57 (1.44)	2 – 3.78 (1.53)	4 – 3.63 (1.18)	2 – 4.22 (0.71)	5 – 3.61 (1.00)
Discounted future cash flows*	5 – 3.32 (1.49)	3 – 3.67 (1.26)	5 – 3.23 (1.37)	8 – 3.26 (1.23)	1 – 3.89 (1.15)
Capitalised maintainable earnings (P/E multiple – forecast basis) ***	6 – 3.27 (1.47)	4 – 3.63 (1.06)	1 – 4.31 (0.87) ^b	7 – 3.66 (1.18)	4 – 3.58 (1.08)
Capitalised maintainable earnings (P/E multiple – historic basis) ***	7 – 3.00 (1.56)	8 – 3.27 (0.98)	2 – 4.27 (0.86) ^b	9 – 3.21 (1.26)	7 – 3.03 (1.12)
Industry's special 'rule of thumb' (eg turnover ratios) ***	8 – 2.68 (1.33)	6 – 3.61 (1.01) ^b	6 – 2.97 (1.13)	5 – 4.13 (0.94) ^b	8 – 2.07 (0.92)
EVA™ (Economic Value Added) or EP (Economic Profit)	9 – 2.19 (1.43)	n.a.	n.a.	n.a.	n.a.
Liquidation value of assets (orderly sale) ***	10 – 2.05 (1.13)	10 – 2.79 (1.04) ^b	10 – 2.05 (1.14)	15 – 2.06 (1.03)	12 – 2.26 (1.13)

Valuation Method 1 = almost never 5 = almost always	Australia⁽¹⁾ Rank-Mean (S.D.) (N = 38)	US⁽²⁾ Rank-Mean (S.D.) (N = 73)	UK⁽²⁾ Rank-Mean (S.D.) (N = 66)	France⁽²⁾ Rank-Mean (S.D.) (N = 32)	Belgium/ Netherlands⁽²⁾ Rank-Mean (S.D.) (N = 38)
Recent P/E ratio of the parent company's shares	11 – 2.03 (1.14)	12 – 2.33 (0.88)	11 – 1.97 (1.01)	10 – 2.45 (1.21)	n.a.
MVA (Market Value Added)	12 – 2.03 (1.28)	n.a.	n.a.	n.a.	n.a.
Option value of projects (eg R&D)	13 – 1.92 (1.04)	n.a.	n.a.	n.a.	n.a.
Historic cost book value ***	14 – 1.84 (1.14)	15 – 2.12 (1.04)	8 – 2.42 (1.26)	4 – 4.19 (0.74) ^b	11 – 2.63 (1.15) ^a
Replacement cost asset value	15 – 1.81 (0.97)	13 – 2.21 (1.04)	13 – 1.91 (1.10)	13 – 2.16 (1.22)	13 – 2.24 (0.94)
Liquidation value of assets (forced sale) ***	16 – 1.81 (0.94)	11 – 2.66 (1.28) ^b	12 – 1.97 (1.06)	14 – 2.06 (1.01)	14 – 2.13 (1.02)
Dividend yield basis ***	17 – 1.70 (1.02)	14 – 2.14 (1.17)	9 – 2.22 (1.11)	11 – 2.29 (1.04)	6 – 3.03 (1.04) ^b

(2) Manigart, S., De Waele, K., Wright, M., Robbie, K., Desbrieres, P., Sapienza, H. & Beekman, A. 2000, 'Venture Capitalists, Investment Appraisal and Accounting Information: A Comparative Study of the US, UK, France, Belgium and Holland, European Financial Management, September, Table 3, p. 397.

n.a. not available, data either not provided in source (2) or not measured

Significance levels for one-way ANOVA, for differences between means * $p < 0.05$;

** $p < 0.01$; *** $p < 0.001$

Significance levels for paired t-tests (post hoc) a= $p < 0.01$; b= $p < 0.001$

Source: (1) Developed from this research.

Australian VCs appear to agree that the most important valuation technique used is the application of a range of scenarios. This is followed by capitalised maintainable earnings (EBIT multiple), capitalised maintainable earnings (EBITDA multiple), recent transaction prices for acquisitions in the sector, discounted future cash flows and capitalised maintainable earnings (P/E multiple – forecast basis).

The use of recent transaction prices for acquisitions in the sector is a popular valuation, method especially in the US and France. However, its usefulness should be questioned as it may be based on acquisitions that are not limited in terms of a stock's marketability and liquidity and therefore does not lend itself to the concept of fair market value (Pratt, Reilly & Schweihs 2000). Incorporating adjustments for the lack of marketability and liquidity would be no more accurate than using theoretically grounded valuation methods. As a generalisation, it appears that the most popular valuation methods are the use of various scenarios, various capitalised earnings multiples, recent transaction prices and discounted cash flow.

Significant statistical differences between the means (one-way ANOVA; $p < 0.05$ or less) were recorded for: discounted cash flow ($p < 0.05$), favoured by Belgium/Netherlands; capitalised maintainable earnings (P/E multiple – forecast basis) ($P < 0.001$), favoured by the UK; capitalised maintainable earnings (P/E multiple – historic basis) ($p < 0.001$), favoured by the UK; rule of thumb ($p < 0.001$),

favoured by France; liquidation value of assets – orderly sale ($p < 0.001$), favoured by the US; historic cost book value ($p < 0.001$), favoured by France; liquidation value of assets (forced sale) ($p < 0.001$), favoured by the US; and dividend yield basis ($p < 0.001$), favoured by Belgium/Netherlands. This is further evidence in support of the above results, which identified VCs as using one main valuation method while utilising other methods as a check. This could explain why there is such a wide range of valuation methods used by VCs, and why previous researchers have found it difficult to explain these differences (Manigart et al. 2000).

The US preferred liquidation value of assets over the other countries, the UK preferred capitalised maintainable earnings (P/E multiples for both forecast and historic basis), France preferred rules of thumb and historic book value, while Belgium/Netherlands preferred discounted cash flow and dividend yield. Even though VCs use a principal valuation method with a number of other valuation methods as a check, this analysis suggests that there are distinct preferences within countries.

Comparison of Methods Used by VCs in Making a Final Selection on a Valuation

A comparison was made between the results obtained from this study with that from previous research by testing for levels of significance between the means using one-way ANOVA ($p < 0.05$ or less). The results are shown in Table 8.

Table 8: Comparison of the Methods Used by VCs in Making a Final Selection on a Valuation

Method for Arriving at a Final Valuation 1 = almost never 5 = almost always	Australia ⁽¹⁾ Rank-Mean (S.D.) (N = 38)	USA ⁽²⁾ Rank-Mean (S.D.) (N = 73)	UK ⁽²⁾ Rank-Mean (S.D.) (N = 66)	France ⁽²⁾ Rank-Mean (S.D.) (N = 32)	Belgium/ Netherlands ⁽²⁾ Rank-Mean (S.D.) (N = 38)
Place greatest weight on one particular method and use others as a check *	1 – 3.81 (1.28)	1 – 3.44 (1.21)	1- 4.15 (1.13)	1 – 3.77 (1.53)	1 – 3.47 (1.43)
Use the average valuation	2 – 2.87 (1.09)	2 – 3.05 (1.15)	2- 2.61 (1.25)	3 – 2.79 (1.40)	3 – 2.77 (1.11)
Use the lowest valuation **	3 – 2.81 (1.42)	5 – 2.47 (0.95)	3 – 2.33 (1.11)	5 – 2.26 (1.26)	5 – 1.88 (1.09) ^a
Use median value *	4 – 2.55 (1.26)	3 – 2.74 (1.08)	4 – 2.29 (1.08)	4 – 2.28 (1.28)	4 – 2.04 (1.04)
Use the highest valuation *	5 – 1.52 (0.77)	6 – 2.05 (0.99) ^a	5 – 1.65 (0.77)	6 – 1.58 (0.81)	6 – 1.69 (0.97)
Apply a weighting to each method and multiply and add the result ***	6 – 1.52 (1.00)	4 – 2.54 (1.08) ^b	n.a.	2 – 2.81 (1.66) ^b	2 – 3.31 (1.23) ^b

- (2) Manigart, S., De Waele, K., Wright, M., Robbie, K., Desbrieres, P., Sapienza, H. & Beekman, A. 2000, 'Venture Capitalists, Investment Appraisal and Accounting Information: A Comparative Study of the US, UK, France, Belgium and Holland, *European Financial Management*, September, Table 4, p. 398.

n.a. not available, data either not provided in source (2) or not measured

Significance levels for one-way ANOVA, for differences between means * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Significance levels for paired t-tests (post hoc) a= $p < 0.01$; b= $p < 0.001$

Source: (1) Developed from this research.

Survey results support those obtained in previous research, in that, VCs in all countries placed greatest weight on one particular method and rated using others as a check very highly ($p < 0.05$). Australia, the US and UK prefer to use the average valuation obtained as their final value whereas France and Belgium/Netherlands use a weighted average ($p < 0.001$). Australia and the UK prefer to use the lowest valuation in contrast to the US, France and Belgium/Netherlands ($p < 0.01$). Fourth ranking was given to the median value for all countries except the US ($p < 0.05$). The Australian and UK results are virtually identical, as are the French and Belgium/Netherlands results. The US appears to stand on its own. It is relatively easy to accept why the Australian and UK results are similar, as are the results from France and Belgium/Netherlands. What is surprising is that the US is different to both these groups. The research data did not allow for reasons to be identified for the similarities and/or differences indicated above.

Further detailed analysis was undertaken using paired t-tests ($p < 0.01$ or less) to determine differences between the results obtained in this research and that obtained in previous research. US VCs prefer to use the highest average valuation in contrast to the Australian VCs ($p < 0.01$). The US had a greater preference than Australia in applying a weighting to each method and multiplying and adding the result ($p < 0.001$). Belgium/Netherlands were less likely to use the lowest valuation compared to Australian VCs. All countries, except the UK, placed a greater emphasis on the use of weighting each method and multiplying and adding the result (US $p < 0.001$, France $p < 0.001$, Belgium/Netherlands $p < 0.001$) compared to Australian VCs.

Summary and Conclusions

This study aimed to fill research gaps by investigating international differences in VC decision making. It has been found that there are significant differences in the decision-making processes internationally. In a number of respects, the VC industry in Australia is more similar to the US and UK than Europe; however, there are some interesting differences. Australian VCs display a shorter time horizon for new ventures than those in Europe and a preference for MBO/MBI investment, which is not defined as VC financing in the US. This implicit 'impatience' with new ventures is a worrying phenomenon for the development of start-up ventures in Australia and an issue deserving policy revision.

This issue is further compounded by the results of the analysis of differences in risk indicators, in which Australian VCs demonstrate a greater degree of risk aversion than their international counterparts in the form of higher required rates of return. Australia and the US were found to be similar in this respect; however, it could be concluded that the stage of development of the overall VC industry and the Australian economy, in terms of its ability to foster new ventures, may provide a case for rates to be more in line with Europe than the US. Australian VC behaviour seems more in line with

that expected of managers of diversified investment funds than the European VCs, whose behaviour is more reflective of higher-risk, less-diversified fund management. This raises the important issue of the role of VCs in general and, more particularly, their role in the overall investment market. The issue is one of whether the fund should be diversified in itself or simply be an investment option for investment managers of broader-based funds. That is, diversification occurs at a higher level in the investment tree.

The method and techniques used by VCs are significantly different across countries, with some taking a broader business focus and others a more narrow financial focus. Future research might investigate these differences, with reference to the cultural differences of the countries concerned using research results from the international management literature. There is clear evidence that VCs tend to use one favoured technique, supported by other methods as a check, even though there are significant differences in the actual favoured technique.

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