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Angel Investing: Changing Strategies During Volatile Times

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Changing conditions in the angel market offer a unique opportunity to further knowledge and understanding about angel investing in the US during times of economic volatility. To identify trends in the angel market, this research examines changes in characteristics and investment behavior during a time of market expansion and contraction (2000 to 2001). While business angels remain the leading source of seed capital for business ventures, depressed yield rates and increased due diligence indicate that investors are retreating to more fundamental approaches.

Introduction

The increase in entrepreneurial activity in the United States during the 1998 to 2000 period was notable in size, scale, and velocity. The critical role of early stage equity financing in this expansionary period, and throughout the history of the entrepreneurial economy, has been noted by researchers (Freear and Wetzel (1990); Sohl (1999); Harrison and Mason (2000)). There are two major external sources of private equity capital for business ventures: business angels and venture capital funds. Business angels represent the oldest, and largest source of seed and equity capital for the high growth venture (Harrison and Mason (2000); Sohl (2003)). Complementary to the angel market is the institutional venture capital market, which invests primarily in the later stage of a firm's development (Timmons and Sapienza (1992); Meyer et al. (1995); Timmons and Bygrave (1997)). Together, angels and venture capitalists provide the majority of high risk equity capital for entrepreneurial ventures. During the expansion leading up to 2000, angel and venture capital investment activity surpassed previous industry records at unprecedented and unsustainable rates. Total venture capital investments increased nearly 15 fold in six years, from US\$6.3 billion in 1995 to US\$90 billion in 2000 (PricewaterhouseCoopers (2001)). The number of deals funded by the venture capital industry increased less rapidly, from 1,128 deals in 1995 to 5,485 in 2000, a five fold increase, or one-

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third of the increase in the dollars invested. In 2000, angel investments were estimated to be approximately US\$40 billion. For the first time in over a decade, venture capital investment dollars exceeded those of the angel market (Sohl (2003)). During this expansionary period, the number of angel portals, categorized by the predominant mechanism for bringing together entrepreneurs seeking capital and business angels searching for investment opportunities, grew by more than 60% (Sohl, Van Osnabrugge and Robinson (2000)).

The 2000-2001 downturn in the economy, after a period of strong growth, offers a unique opportunity to further knowledge and understanding of angel investing through a comparison of activities during the two periods. There is strong evidence that start-up firms contributed significantly to the long period of economic growth in the 1990s (Progressive Policy Institute (1999)). The downturn, especially acute in the start-up sector, signified considerable changes in the early stage equity markets, both for angels and venture capitalists. The venture capital industry contracted significantly, with 2001 investments falling to US\$36 billion (in 3,928 deals), a 60% decline from 2000, and a retraction to 1999 investment levels in both investment dollars and number of investments (PricewaterhouseCoopers, 2002). Angel investments have shown similar declines in terms of dollars invested (US\$30 billion in 50,000 deals), but have not declined as sharply in terms of number of investments (Kaiser (2002)).

This expansion and contraction offers a unique opportunity to further knowledge and understanding about angel investing in the US during times of economic volatility. How and why the angel market changed offers key insights into some of the contributing factors of early stage investment resiliency and vulnerability during difficult economic periods. The expansion and contraction offered both opportunities and challenges and allowed investors to change their fundamental approach toward private equity financing. Many new, perhaps less sophisticated, investors entered during the market upswing. Many experienced angels altered fundamental screening and due diligence methods. As the private equity market began to overheat, investment activity dramatically increased to levels that proved to be unsustainable. Relaxation of past risk-reducing methods of diligent proposal analysis seemed to fuel the market upswing, as well as the eventual fallout. The excessives of the rising market gave investors good reason to retool their “new economy” approaches and retreat back to the fundamentals. Astute angels began to rethink their strategies and retrench for the future.

This change in angel investment behavior generates many critical questions. How did angel groups and investor networks alter their investment strategies since the pinnacle of the last economic expansion? What methods are employed for deal sourcing by the angel groups in the post expansion period? Has the angel market entered a more realistic phase with greater scrutiny by investors and better preparation of entrepreneurs when seeking equity capital? Is the market expanding or contracting in reaction to the excessives of 2000? With the hope of improving efficiency in the private equity market, this study aims to answer these questions through an analysis of the activity of angel portals in 2000 and 2001 and offer insights on the current state of the business angel market. These two time periods (2000 and 2001) provide an opportunity to enhance the knowledge of angel investing and to develop an understanding of early stage investment resiliency and vulnerability during difficult economic periods.

I. Hypotheses development

Angel investors have been identified as the major source of seed and start-up capital for entrepreneurial ventures in the US, with investment amounts in the US\$100,000 to US\$1 million range (Harrison and Mason (2000); Sohl (2003)). The motivation for this seed and

start-up stage investing is the opportunity to start businesses and play a role in the entrepreneurial process (Mason and Harrison (1994); Landstrom (1997)) and the chance to act as an entrepreneur in the investment process (Politis and Landstrom (2002)). Business angels often act as financial intermediaries assessing of small business quality through a variety of activities, including screening, contracting and monitoring, and help address broader information problems inherent to the private equity market (Berger and Udell (1998)).

In the United Kingdom it has been estimated that during the 1999-2000 period, close to 60% of angel investments were at the seed and start-up stage and over 75% of these investments involved amounts less than US\$200,000 (Mason (2001)). More recently, this threshold for early stage investments during 2000 has been raised to US\$500,000 (Mason and Harrison (2002a)), which is, in part, a reflection of the rise in valuations during the economic upswing. While the threshold amount is of interest, the role of angels as providers of seed and early stage risk capital is the focus. In a Canadian study, more than 60% of angel investments were in the seed or start-up stage (Feeney, Haines and Riding (1999)). The funding importance of business angels has been even greater in recent years as the venture capital segment has shifted focus away from start-ups and early stage firms in favor of more mature ventures (Van Osnabrugge (2000); Sapienza et al. (1996)) and angels have been recognized as occupying a critical place in the private equity financing spectrum (Brophy (1997); Berger and Udell (1998); Sohl (1999); Mason and Harrison (2000a)).

While angels have been predominately seed and start-up investors, there is reason to hypothesize that angels may be participating in later stages at a higher frequency. As venture capital investments continued to increase in deal size during the study period, a substantial secondary gap in the private equity market has developed in the \$2-\$5 million range (Sohl (2003)). Companies that have successfully secured seed and start-up capital are finding increasing difficulties in securing follow-on funding. With the venture capital industry needing to hold funds for additional rounds for portfolio companies and deal size increasing, this secondary gap is not being filled by the venture capital industry. Further support for the potential retreat of angels from the seed and start-up market is that first sequence investments (first time investment in a particular company) by venture capital funds decreased from 41% in 2000 to 24% in 2001 (PricewaterhouseCoopers (2002)), indicating that nearly three quarters of venture capital investments are in companies that are already in their portfolios. Thus, angels may be called upon to provide a second round of financing beyond the seed and start-up stage. The salient question is if this represents a possible restructuring of the angel market, with a reallocation away from the seed and start-up stage, or an increasing role for angels as both seed/start-up investors and second round providers of capital. If angels are reacting to this stage and first sequence migration by venture capitalist, one may expect business angel investors to shift their strategies toward follow-on investments, and thus reduce their proportional amount of seed/start-up investments. These trends in the private equity market lead to the formulation of the first hypothesis:

H1: Business angels continue to invest primarily in the seed and start-up investment stage.

An important component of the early stage equity market is the existence of the funding gap in the seed and start-up stage (Freear and Wetzel (1990); Mason and Harrison (2000b); Sohl (2003)). This gap has been interpreted as a consequence of market inefficiency (Wetzel (1986); Wetzel (1987)) and is in part due to the increase in marginal transaction costs

experienced by large venture capital firms. The existence of private investors and indications that capital is available, but quality deal flow is lacking (Mason and Harrison (1994); Sohl (1999)), suggests that this persistent funding gap is, in part, due to the inefficient flow of information. In the informal venture capital market, with the suppliers of capital seeking a degree of anonymity, often in conflict with the need to maintain quality deal flow, information can flow very inefficiently. Additionally, the significant information asymmetries inherent in the private equity market highlights the importance of the principle-agent relationship and allows for significant agency risks, particularly adverse selection problems. Amit et al.'s (1990) examination of the implications of this relationship between entrepreneurs and venture capitalists found that the adverse selection problem created allowed for the less profitable ventures to be sold to venture capitalists and the more profitable ones to be retained by the more skillful entrepreneurs. Thus, angels may attempt to overcome these inherent difficulties with an increased reliance on personal communications with the entrepreneur and the ability to judge their character through face-to-face communications and interactions in a variety of settings.

As a means of increasing the efficiency in the angel market and given the growing availability, and usage, of electronic communication, it has been suggested that the angel market could benefit through the use of the Internet as a major tool for deal sourcing. Prior to the last economic cycle, research indicates that electronic networks in the private equity market had been largely unsuccessful, with less than 1% of equity raised in 1997 being attributed to on-line sourcing (Private Equity Week (1998)). Also, the angel market has historically been one that conducts business on a face-to-face level for both deal sourcing (Freear, Sohl and Wetzel (1994); Coveney and Moore (1998); Reitan and Sorheim (2000); Sorheim and Landstrom (2001); Günther (2005)) and investment decisions (Landstrom (1992); Fiet (1995a); Harrison and Mason (2002)). Likewise, angels rely more on the entrepreneur in the investment decision. Since the investment is in the seed and start-up stage, there is a paucity of financial history, past performance data and the absence of a track record of growth performance. As such, angels tend to depend on the entrepreneur to protect them from losses due to market risk and are thus more concerned with agency risk than market risk (Fiet (1995b)). Thus, the influence of electronic communication as a method to provide for more efficient investment proposal evaluations, the impact of agency risk and the adverse selection problem, leads to the investigation of the process of angel deal sourcing and investing.

H2: Angel deal sourcing and investing remains a face-to-face exercise.

During the surge of investment activity taking place in 2000, there was a general consensus that this frantic pace may have contributed to less than optimal decision making by angel investors (Sohl (2003)). Likewise, it is surmised that the post 2000 effect ushered in a more realistic phase with greater scrutiny by investors and better preparation of entrepreneurs when seeking equity capital. The expansion and contraction offered both opportunities and challenges and allowed for fundamental changes in private equity financing for both the supply (angel) and demand (entrepreneur) side. These changes can best be determined through an examination of yield rates, due diligence procedures and entrepreneur expectations.

The yield (acceptance) rate is defined as the percentage of investment opportunities that are brought to the attention of investors (by the angel organization) that resulted in an investment. Based on data collected on angel investments in Norway from 1995 to 1998, yield

rates for investment proposals were estimated to be 16.4% (Sorheim and Landstrom (2001)). In an earlier study of UK angels, yield rates were determined to be 6% (Mason and Harrison (1994)), although this estimate was based on a sample of only 35 investments by a small group of angels. The only study to date on US angel yield rates focused on referral efficiency and determined acceptance rates based on the source of the deal flow (Freear, Sohl and Wetzel (1994)). In Australia, angel yield rates during the 1990 to 1994 period increased from a low of 12% to a peak in 1994 of 31% (Hindle and Wenban (1999)). In a larger study of Canadian private investors, the yield was determined to be 11.6%. However, it should be noted that the average size of Canadian angel investments is at least twice the size of those in the US, which stems from Canadian securities laws that financially penalize smaller deals (Riding et al. (1997)). In a study based on angel activity during the market uptake, business angels identified two important elements in the initial screening stage: the extent to which the proposal meets their personal investment criteria and the intuitive assessment of the proposal. Although this stage took only about ten minutes, 27% of proposals resulted in an investment (Mason and Harrison (2000c)). In a post 2000 study in the UK, over 80% of investment proposals were rejected due to poor quality (Mason and Harrison (2002a)). While these studies are insightful, it is argued that these European countries did not experience the volatility of the private equity markets that existed in the US.

In any discussion of yield rates, it is important to note that both the number of investment proposals considered (the denominator) and the number invested (the numerator) play an important role. In hyperactive markets the demand for capital increases as more entrepreneurs seek to take advantage of both the perceived increase in the supply of private equity and the increase in the probability to reach liquidity. Liquidity in this context is an exit through either a merger, acquisition or initial public offering (IPO). Similarly, the supply of capital is increased through a higher frequency of previously successful exits (which provide a source of capital for angel investments) and the desire to reach liquidity during current market conditions. Thus, the demand for capital increases, while at the same time the supply is increased. The rate of investment also increases as a result of the perceived opportunity for a profitably and timely liquidity event. The combination of these factors contributes to a possible increase in the yield rate during times of expansion. Conversely, yield rates during markets contracting should experience an opposite effect. On the supply side, as contraction in the IPO and M&A markets decrease the probability of a swift and lucrative liquidity event, capital is reserved for possible additional rounds of financing for the survival of portfolio companies. In addition, the decrease in the likelihood of liquidity promotes both a more cautious and more discriminating approach to investment decisions. Unfortunately, the demand side may not react as quickly to these market changes. That is, entrepreneurs are still developing ventures based on the robust expansion of 2000. Compounding this effect is that entrepreneurs are inclined to present their proposals to more angels, since the prospects for financing are diminished, requiring a wider search for capital. Further contributing to the conditions effecting the yield rate is the due diligence process (hypothesis 4). In markets with more scrutiny for the quality of the venture in the liquidity event, as experienced by the decline of IPOs during the post 2000 period, there is an increased time to conduct this more through due diligence. As such, the longer it takes the angel investor to conduct due diligence, the smaller the number of investments that can be reviewed, contributing to a lower yield rate. Thus, pressure from both the increase in the demand (denominator), the decrease in the supply (numerator) of capital for new ventures, and the more cautious approach to due diligence, should contribute to a decrease

in the yield rate. This suggests the following hypothesis for US investment yield rates during especially unstable periods of economic activity:

H3: Yield rates in the angel market inflate in overactive markets.

In one of the earliest studies of the angel investment process in the US, due diligence is calculated as the time between the first meeting of the angel and entrepreneur, and the receipt of the investment funds (Freear, Sohl and Wetzel (1995)). The median elapsed time was 2.5 months for private investors (4.5 months for venture capital funds), with the shorter deliberation time for due diligence for angel deals being attributed to the smaller number of people involved in the decision process and the fact that angels tend to invest in fields with which they are familiar (Freear, Sohl and Wetzel (1995)). In the UK, the time for angels to conduct due diligence was two months and the research also confirmed that venture capitalists take longer, for many of the same reasons as outlined in the US study (Van Osnabrugge (2000)). This length of time to conduct due diligence is commonly used as an indication of the thoroughness of the due diligence process (Douglas and Shepherd (2002); Mason and Harrison (2002b)).

Due diligence may be effected by markets experiencing changes in a relatively short period of time. Many new, perhaps less sophisticated, investors entered during the market upswing and experienced angels altered fundamental screening and due diligence methods. Spurred on by the hot IPO market and the increasing competition for deals, the pressure to make the investments increased and the time devoted to due diligence decreased. Due diligence appeared to become an after-thought and anecdotes of due diligence completed in short periods of time began to appear (Sohl (2003)). In the market expansion period, external signals to the private investor may confound the due diligence process and result in a reduction in the thoroughness of due diligence. In essence, through the signaling that current market conditions (robust IPOs with large returns) translate into the perception that the ventures are of higher quality, then one would take less time to reach the investment decision. The inclination is to invest, since the opportunities must be good. This is in contrast to the normal assessment by the private investor that the level of risk is substantial, the chance for failure high, and the modus operandi being the proposal is not of high quality and due diligence must prove that the venture can overcome this conception. Thus, in markets that are in contraction, ventures are deemed to be a lower quality and more time is needed to screen these investment opportunities. It is surmised that relaxation of past risk-reducing methods of diligent proposal analysis seemed to fuel the market upswing, as well as the eventual fallout.

H4: Due diligence is more carefully measured during contracting markets.

Angel research has come to the general conclusion that most active business angels are unable to invest as frequently as they would wish because of a lack of suitable business proposals (Mason and Harrison (1994); Sohl (1999); Van Osnabrugge and Robinson (2000)). This has led to a determination that entrepreneurs often are not “investor ready” (Mason and Harrison (1999)). The main deficiencies that investors note in the proposals are that the business plans contain unrealistic assumptions or information that is not credible and that the entrepreneur/management team lacks credibility (Mason and Harrison (2002a); Mason and Stark (2004)). In general, entrepreneurs appear to be unrealistic in their assumptions of the

business concept and growth prospects (Mason and Rogers (1997); Feeney et al. (1999); Cassar (2004)). The main reason cited by UK angels as to why the investment was not made was because the angel and entrepreneur could not agree on the price (total amount of funding) of the deal (Mason and Harrison (2002a)). One would surmise that this lack of realism is exacerbated in hyperactive markets and mitigated in declining markets. One potential measure of the degree of realism in the entrepreneur's search for growth capital is the difference between the funding sought by the entrepreneur (deal size sought) and the actual amount invested in the deal (deal size invested) by the angel.

An additional consideration in the examination of the difference between the amount of funding sought and the amount obtained is the staging of private equity investments. Angels and venture capitalists employ an assortment of strategies to reduce the significant risks associated with venture investing, and investment stage considerations can be significant when evaluating agency risks (Gompers (1995)). Since more information is available in developed firms, investments in later stage firms seem to reduce agency costs. Staging of investments can be viewed as a control mechanism to manage these agency costs (Sahlman (1990)). In contrast to angel deals, venture capitalists arm themselves with a variety of contract provisions and covenants (Sohl and Areson-Perkins (2001)) and set milestone contingency restrictions on the incremental amount of committed financing. This staging of capital infusions affords the opportunity to gather information and assess the ventures progress, while maintaining the option to abandon the investment (Gompers (1995)). As such, the size of the investment may be an indication of this staging strategy. For venture capitalists the research indicates that early stage firms receive significantly less money per round, stage investments as a risk reducing and monitoring process, and maintain the ability to stop future financing when prospects for returns are negative (Gompers (1995)). In a market in contraction, one would expect these staging considerations to play an even more significant role. However, an important consideration is that angels do not possess the wealth of capital afforded a venture capital fund, since angel investors are individuals, rather than investment funds. Thus, angels do not necessarily have the financial resources to spread the investment over several stages. It is possible that angels will reduce the amount for the initial round and spread the given amount over several tranches within a round, an event more likely in the angel market.

Thus, the combination of the degree of realism in the entrepreneur's search for capital, the investor ready considerations of the angel investor and the staging of private equity investment as a risk reducing measure, lead to the development of the following hypothesis:

H5: (Deal size invested - deal size sought) approaches zero in post-hyperactive markets.

II. Methodology

Previous research has shown that angel investors prefer to invest in groups for an array of reasons, including the reduction of agency costs and risks, market risks, adverse selection risks, and transaction costs (Sohl, Van Osnabrugge and Robinson (2000)). Prior to the late 1990's these angel groups were informal gatherings of angels typically formed on a per investment deal basis. Since 1998 there has been an increase in the more formal angel groups. These types of angel groups, or portals, include formal matching services and "named" angel groups and angel alliances that meet regularly to review investment opportunities. While only 10 recognized angel groups existed in 1996, these ranks have grown to close to 140 in 2000 and 2001. Data for this research was collected from a variety of angel portals that were widely

disbursed throughout the US. The organizations participating in the study averaged just over 100 angel investors with diverse investing approaches and practices. While not all business angels source their investments through angel portals, the activity that takes place in and around these portals is a reasonable representation of angel market behavior. The portals participating in the study reported a growing number of members. A percentage (25% to 40%) of this growth includes latent investors who are not actively investing in the years covered by this research. These novice investors, who lack the extensive social networks, may be attracted to these organizations because it may enable them to find sufficient deal flow. However, the active investors, comprising 60% to 75% of the angel organizations, were seasoned investors significantly contributing to market activity. Additionally, the active investors not only invested with other members of the organization, they also invest with angels outside of the organization. As such, it appears that the findings, although based on angel groups, are representative of the more general angel population.

As a means of portraying activities within the current state of the business angel market in the US and to test the hypotheses outlined in the previous section, a survey-based approach was employed. This survey was divided into two sections, the characteristics of the angel organization and the characteristics of the individual investors that are members of the organization. The survey was directed towards angel portals, which can be categorized according to the predominant mechanism for bringing together entrepreneurs seeking capital and business angels searching for investment opportunities. These mechanisms include formal matching services that match entrepreneurs with investors through a data base, angel groups that meet regularly to review opportunities (angel alliances), organizations that facilitate the angel investment process by organizing meetings or events that bring together both angel investors and entrepreneurs, and Internet-only networks. The operational practices and performance were articulated through industry preferences, membership and their participation rate, yield rates, deal sourcing and related investment activity. Data collected that described member investor characteristics included stage preference, due diligence procedures, valuations, deal size and participation by women entrepreneurs and investors. To compare angel investor's approach, activities, behaviors and performance over time, the survey instrument collected data for years 2000 and 2001. This data collection for the two time periods was accomplished with one survey instrument. Thus, the longitudinal data represents data from the same respondents, which facilitates the comparisons across the two time periods. These two time periods (2000 and 2001) provide an opportunity to develop an understanding of early stage investment resiliency and vulnerability during volatile economic periods.

A comprehensive questionnaire was distributed to 174 of the known private investor clubs, angel alliances and matching networks in the US. Each organization was contacted on multiple occasions and through various mediums. A letter of introduction sent through US mail was the initial contact. The actual questionnaire followed, also through US mail. For those organizations that did not respond to the first questionnaire, a second copy of the questionnaire, accompanied with a letter of encouragement, was distributed. Email messages, with a copy of the questionnaire attached, were sent to all possible groups who did not respond to the first two requests. Telephone contact was established with groups who did not respond to any previous attempts. In most circumstances, either the CEO or lead member of the management team was the primary contact and the individual who completed the survey. This participation of high-level management was considered essential in order to assure the accuracy of the responses.

Of the 174 organizations, 126 were confirmed to exist. Of these 126, 47 surveys were returned, representing a response rate of 37%. To access the potential for non-response bias, non-respondents were contacted. Ten percent of the non-respondents contacted provided reasons for their non-response. The largest category of non-respondents (80%) was those that considered that the data requested does not apply to their type of organization. For the remaining non-respondents, the reasons for non-response included those that do collect data and were therefore unable to provide the information for the survey (9%) and those that were no longer active (9%). Any within survey time related non-response bias was also evaluated. In this contact, the early respondents (the first half of the data for the survey) were compared to the late respondents (the last half of the respondents). It is surmised that those responding late to the survey, after a follow-up contact, would be most similar to non-respondents. For each of the years and responses germane to this research there appeared to be no significant differences between the responses of these two groups.

The respondents represented a diverse set with respect to geographic location and organizational structure and as such, the sample appears to adequately represent the disbursement of angel activity in the US. With respect to organizational structure, 55% of the respondents are classified as organizations that facilitate the angel investment process by organizing meetings or events that bring together both angel investors and entrepreneurs, and 36% are considered to be angel groups that meet regularly to review opportunities (angel alliances). In contrast, 9% are formal matching services that match entrepreneurs with investors through a data base and none of the organizations can be classified as Internet-only networks.

This dispersion of the types of angel organizations with respect to the meeting and deal enactment format is representative of the population of angel portals. A compilation of existing angel organizations in the US, that is the closest in time to the 2000 and 2001 survey, was conducted in 1998 (Van Osnabrugge and Robinson (2000)). The research, with respect to the structure of angel organizations, indicates that 54% of the angel organizations are classified as organizations that facilitate the angel investment process, 24% are formal matching services, 21% are angel groups, and 1% of the organizations can be classified as Internet-only networks (Van Osnabrugge and Robinson (2000)). This compilation compares favorably with the 2000/2001 survey results, except for the larger number of angel groups (36% in 2000/2001 versus 21% in 1998) and matching networks (9% versus 24%). However, research indicates that in the period between 1998 and 2000 there was a marked increase in the number of angel groups and at the same time a decline in the number of matching networks (Sohl (forthcoming); Amatucci and Sohl (forthcoming)). Since the sample emulates the structure of the angel portals, this lends support for the credibility of the results, with respect to angel portals.

The methodology is open to a potential source of bias since individuals that are members of angel portals or groups may not be representative of the general population of business angels. There are several reasons to indicate that this potential bias is mitigated. First, portals are in essence a manifestation of the historical syndication characteristic of the angel market. Portals were developed as a way to formalize a process that was in existence since the initiation of the study of angels in the early 1980s (Wetzel (1983)). Second, previous research indicates that there are few differences between angels that are members of portals and those who are not (Van Osnabrugge (1998)). Third, to assure a representative sample, the data was derived from a variety of angel organizations. These organizations include significant differences with respect to size (number of members), organization structure (highly organized

with formal bylaws to informal collections of angels), regions (geographical diversity), investment objectives (sector specific to a wide range of sectors) and age (organizations founded over a decade ago to those in the last few years). Fourth, to assess the investment activity of the members of the angel organizations the respondents indicated the percentage of their angels that are making investments. In 2000, the median percentage of members actively investing was 70% and in 2001 it was 80%. Thus, active investors comprised the majority of the members of the angel organizations and were significantly contributing to market activity with their track record of investment activity. Lastly, angels typically invest with five to seven other angels as a means to mitigate agency risks, costs and market risks (Sohl, Van Osnabrugge and Robinson (2000)). As such, the angels not only invest with other members of the organization, they also invest with angels outside of the organization as a risk reduction strategy (Sohl, Van Osnabrugge and Robinson (2000)).

Another potential bias is that the respondents are the executive directors or presidents of the angel clubs. In most cases, these administrators are also active investors. In all cases, it is the role of the administrator to have an intimate understanding of the workings and activity of the membership. These individuals are responsible for many activities, including organizing screening committees, assisting in forming investment syndicates, participating in the due diligence process, assisting in the valuation exercise and tracking the deal. Through a close working relationship with the members and lead investors, these administrators are in the unique position to view the activities of the organization through an organizational lens, rather than the myopic view as an individual investor in a single deal. As such, they are able to provide detailed activity information from an organizational perspective.

III. Analysis

A. Stage and deal sourcing

Seed financing is the relatively small amounts of equity capital provided to an entrepreneur to prove a concept and to qualify for start-up capital. This capital is often used to support exploration of a concept before the venture is in operation. Start-up capital typically enables the venture to proceed from the research and development phase to initial production and limited sales, including the completion of product development and initial marketing. In both of these stages there exists a substantial amount of risk, including both the risk of discovery and the question of whether a cost effective manufacturing process can be implemented. Angels have traditionally been the largest source of seed and start-up stage capital in the US, with investments typically below the US\$1 million threshold. However, given the recent volatility and poor investment performance, angels may have been inclined to retreat from these high risk investment stages. These developments lead to H1: *Business angels continue to invest primarily in the seed and start-up investment stage*. Based on the data collected for 2000 and 2001, there appears to be substantial support for H1 (Table I). The data indicate that angels, through their membership in angel portals, continue to favor the early stages, with 51% of the 2000 angel portal investments, and 45% for 2001, in seed and start-up stage entrepreneurial ventures. This represents the largest stage for angel investment activity. Further support for H1 can be garnered from complimentary data from the venture capital industry. In 2000, investments by venture capitalists in the seed and start-up stage represented 3% of the total dollars invested and 8% of the total investments made, and for 2001, 2% of dollars and 5.1% of deals (PricewaterhouseCoopers (2002)). It should be noted that angel portal members also indicate a slight increase in later stage investing, up 10% from 2000 to

2001. Clearly, angels are not retreating from seed and start-up investing, but it appears that market conditions are requiring angels to provide some follow-on financing for their investments. First sequence investments (first time investment in a particular company) by venture capital funds decreased from 41% in 2000 to 24% in 2001 (PricewaterhouseCoopers (2001)), indicating that nearly three quarters of venture capital investments are in companies that are already in their portfolios. Thus, angels are often required to provide some additional rounds of financing, and this is reflected in the slight increase in angel investments in the later stage.

This preference for seed and start-up investing impacts the process of deal sourcing and investment decisions. In the informal venture capital market, with the suppliers of capital seeking a degree of anonymity often in conflict with the need to maintain quality deal flow, information flows very inefficiently. In addition, the inherent nature of seed investing is one that has information asymmetries with adverse selection problems and significant agency and market risk. Also, the lack of a company track record, and the absence of a product, since the stage is essentially a proof of concept, adds to the information asymmetries, as does the situation that the major assets of the venture are the intellectual property of the entrepreneur. These inefficiencies may be an unavoidable consequence of the stage of the market. To overcome these inefficiencies angels have traditionally relied on personal networks, as stated in H2, *Angel deal sourcing and investing remains a face-to-face exercise*. However, given the increased availability, and usage of electronic communication, it has been suggested that the angel market could benefit through the use of the Internet as a major tool for deal sourcing. Also, research has indicated that business angels may have limited access to deal flow relative to venture capitalists (Fiet (1995b)) and the use of more efficient deal sourcing methods could allow angels access to a larger pool of deals. To test hypothesis 2, the angel portals categorized the primary deal sourcing and investment process method that is employed. Clearly, H2 is supported, and angels remain committed to face-to-face interaction, with 70% of the portals (Table II) relying on some form of high-touch mechanism as their primary matching method. Specifically, 38% of the portals utilize venture forums (entrepreneurs making presentations to groups of investors) and 32% rely on personal networking among angels to both source deals and enact the investment decision. The prevalence of the venture forum and personal network process of generating deal flow is testament to the hands-on nature of the angel market and the importance of the entrepreneur and the management team in the success of these high-risk ventures. In addition, the venture forums and personal networks offer a degree of vetting of the deal and thus help to increase the quality, as opposed to the volume, of the deal being offered. Further support for H2 is evident through the lack of widespread use of the Internet. Only 11% of the portals indicate the use of the Internet as the primary matching method, and none of the respondents indicate that they would consider their organization to be an Internet-only operation. In addition, none of the portals rely on newsletters to transmit deal opportunities. Since business angels attach a greater level of importance to agency risks than venture capitalists (Fiet (1995b)) this lends additional support to the more intimate face-to-face nature of business angel deal activity. Also, since angel's screening and deal evaluation is largely focused on the competencies of the entrepreneur, then interactions that allows for the greatest amount of primary information gathering about the entrepreneur, such as face-to-face information exchanges, may be prudent. Although a variety of information technology, including the Internet, can reduce both transaction and agency costs, it seems that the value angels still receive from personal interaction with entrepreneurs throughout the deal screening

and negotiations continues to outweigh the relative inefficiency of this personal communication.

B. The investment process

While a rise in investment activity in 2000 may have contributed to less than optimal decision making by angels, the post 2000 period may have ushered in a more realistic phase with greater scrutiny by investors and better preparation of entrepreneurs when seeking equity capital. The expansion and contraction may have provided the foundation for fundamental changes in private equity financing for both the supply (angel) and demand (entrepreneur) side. These changes can best be determined through an examination of yield rates, due diligence procedures and entrepreneur expectations.

The yield (acceptance) rate is defined as the percentage of investment opportunities that are brought to the attention of investors (by the angel organization) that resulted in an investment. Considering investment behavior during the height of the investment bubble in 2000, one would expect to see relatively high yield rates during this time period. The data from this study confirm this perception (Table III). In 2000, the yield rate reached 23.3%, which was significantly higher than any other year examined. Reviewing statistics for 1997 and 1998, years preceding the bubble, reveals lower yield rates of 12% and 14%, respectively (Sohl, Van Osnabrugge and Robinson (2000)). As conjectured, after the bubble in 2001, yields dropped to 10.79%. These data appear to support H3, *yield rates in the angel market inflate in overactive markets*. In addition, analysis of the yield data reveals that the significant drop in the yield ratio was caused by pressure from both the numerator and the denominator. In 2001, investment groups present investors 29% more investment proposals than in 2000, and investors executed 43% fewer deals than 2000. Thus, pressure from both the increase in the demand (denominator), the decrease in the supply (numerator) of capital for new ventures, and the more cautious approach to due diligence (see below), contribute to a decrease in the yield rate.

The decrease in the actual deal investment activity in 2001 may be the result of a number of factors, including more patience in the performance of due diligence, a more measured approach to angel investing, and knowledge gained from the high failure rates of the post bubble investments. Analyzing the length of time angels spend evaluating deal proposals may further support these ideas. Survey results indicate that angels spent, on average, close to an extra month, or 25% more time (Table IV), on performing due diligence in 2001 than they did in 2000. These data lend support to H4, *due diligence is more measured in markets in contraction*. In real time, the average length of time angels spend considering an investment opportunity has increased from 3.3 months, in 2000, to 4.1 months, in 2001, although this difference is only partially supported (p value = 0.109). However, relative to other private equity investors, angels spend the least amount of time in this process (Freear, Sohl and Wetzel (1995); Van Osnabrugge (2000)). Survey results illustrate that it took venture capitalists and corporate investors, on average, five and six months, respectively, to close a deal in 2001. Similarly, both of these groups reported an increase in this time period of one month from 2000. This does not necessarily indicate that angels are less diligent than their venture capital counterparts, but it may suggest that they are more efficient.

For the demand (entrepreneur) side, one would also expect a retrenching behavior with more realistic expectations when seeking equity capital from business angels. To gauge this possible change in expectations, data is collected that reflects the average amount invested, per

deal, for all the investments enacted by the angel portals in the survey. These data are compared to the average funding sought by entrepreneurs that presented investment opportunities to the member angels. It is assumed that major discrepancies between entrepreneur expectations and investment amounts were either reconciled during the negotiation phase or resulted in a failure to conclude the investment. It should be noted that in this instance, this is the one case where data are derived from two different samples, although the design and implementation of the surveys were close to identical. The respondent profiles are also similar across these two samples (1998 and 2001) with respect to angel portal characteristics. Thus, the sample design allows for comparisons to be made, while mitigating the potential for any bias due to different sample frames or respondent profile characteristics.

In 1998, entrepreneurs, on average, estimated funding needs at the seed and start-up stage to be US\$826,042 and the average dollars invested per deal are US\$142,167, representing a discrepancy of -US\$683,875 (Sohl, Van Osnabrugge and Robinson (2000)). In contrast, in 2001, entrepreneurs, on average (Table V), estimate funding needs at the seed and start-up stage to be US\$1,134,375 and the average dollars invested per deal are US\$806,042, representing a discrepancy of -US\$328,333, based on the current survey results. There appears to be no support for H5, (*deal size invested - deal size sought*) *approaches zero in post-hyperactive markets*. The difference between the deal size invested and deal size sought is not statistically significant. The supplier of capital and the entrepreneurs seeking investments (the demand side) appear to not have adjusted expectations from the hyperactive markets of 2000 and earlier. It appears that these angel deals are in need of further calibration. It is of interest to note that while the focus of this analysis is on the difference between the deal size invested and the deal size sought, the growth in average dollars invested per deal is substantial. Recall that 1998 was the initial stages of the expansion of the private equity markets and 2001, even though a down year, indicates a substantial increase in the dollars invested per deal. It is important to note that 2001 is a down year in comparison to 2000, but not necessarily compared to 1998. Data collected in the current sample reveals such. Average dollars invested per year for 2000 was \$934,045. As noted, for 2001 it was \$806,042. Thus, the sample reflects this downturn in the market.

IV. Conclusion

The expansion of the private equity market leading up to 2000 and the subsequent downturn in 2001 provides a unique opportunity to increase our understanding of the angel market through an examination of market activities during this volatile period. How the angel market characteristics and investment processes changed during this expansion and contraction was the focus of this research. Regarding the stage of investments, it appears that individual investors, as members of angel portals, continue to be the major source of seed and start-up financing for entrepreneurial ventures. In addition, angels are also providing some later rounds of equity capital, but this slight movement to later stages appears to be more out of necessity due to a lack of second round capital, rather than a fundamental change in investment attitudes. The research also supports the continued reliance on face-to-face interaction for deal sourcing and investing, possibly as a method to mitigate some of the information asymmetries and agency risk that is inherent in the angel market. The angel investor appears to have reacted to the post 2000 decline by adopting measured approaches to the investment process. These include a more cautious approach to due diligence and an increase in the scrutinizing of investment opportunities, as indicated by the decline in yield rates. It is important to note that

these changes are in many ways a retreat to the investment fundamentals of the pre-2000 era, rather than a major restructuring of the industry. In general, the angel market has emerged from the post 2000 contraction in a relatively healthy state, especially when compared to some of the severe restructuring experienced in the other components of the private equity market.

While much has been learned from the examination of the angel market during the recent expansion and contraction in the economy, much remains in question. This research was one of the first attempts to provide a longitudinal investigation of the angel market, especially during a time of economic volatility. However, continued longitudinal data collection needs to be undertaken. Current research, which relies largely on cross sectional analysis, should be supplemented with longitudinal research. More extensive longitudinal angel research would allow for trend analysis and provide valuable insights on changing seed and start-up stage market conditions and angel organizational structure. Thus, while the angel market appears to have emerged from the 2000-2001 restructuring in a reasonably sound state, continued research on market conditions is necessary to assure the sustainability of this critical market for seed and start-up investments in entrepreneurial ventures.

REFERENCES

- Amatucci, F. and J. Sohl, forthcoming, Trends in the angel market, in A. Zacharakis and S. Spinelli, eds.: Entrepreneurship, Volume II: The Process, (Praeger Perspectives).
- Amit, R., L. Glosten and E. Muller, 1990, Entrepreneurial ability, venture investments and risk sharing, Management Science 36(10), 1232-1245.
- Berger, A. and G. Udell, 1998, The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle, Journal of Banking and Finance 22(6-8), 613-673.
- Brophy, D.J., 1997, Financing the growth of entrepreneurial firms, in D. Sexton and R. Smilor, eds.: Entrepreneurship 2000 (Upstart Publishing Company, Chicago, IL) 5-27.
- Cassar, G., 2004, The financing of business start-ups. Journal of Business Venturing 19 (2), 261- 284.
- Coveney, P. and K. Moore, 1998. Business Angels: Securing Start-Up Finance (Wiley Press, Chichester,UK).
- Douglas, E.J. and D. Shepherd, 2002, Exploring investor readiness: assessments by entrepreneurs and investors in Australia, Venture Capital: An international journal of entrepreneurial finance 4(3), 219-236.
- Feeney, L., G.H. Haines and A.L. Riding, 1999, Private investors' investment criteria: insights from qualitative data, Venture Capital: An international journal of entrepreneurial finance 1(2), 121-146.
- Fiet, J., 1995a, Reliance upon informants in the venture capital industry, Journal of Business Venturing 10, 195-223.
- Fiet, J., 1995b, Risk avoidance strategies in venture capital markets, Journal of Management Studies 32(4), 551-574.
- Freear, J. and W.E. Wetzel, 1990, Who bankrolls high-tech entrepreneurs?, Journal of Business Venturing 5, 77-89.
- Freear, J., J. Sohl and W.E. Wetzel, 1994, The private investor market for venture capital, The Financier 1, 7-15.
- Freear, J., J. Sohl and W.E. Wetzel, 1995, Angels: personal investors in the venture capital market, Entrepreneurship & Regional Development 7, 85-94.

- Gompers, P.A., 1995, Optimal investment, monitoring, and the staging of venture capital, The Journal of Finance 1(5), 1461-1489.
- Günther, U., 2005, 'Successful approach for increasing growth and access to investment', presentation at Swedish Foundation for Small Business Research seminar 'The arena of informal capital – huge demand but who supplies?', Brussels, 4 June.
- Harrison, Richard T. and Colin M. Mason, 2000, Venture capital market complementarities: the links between business angels and venture capital funds in the UK, Venture Capital: An international journal of entrepreneurial finance 2(3), 223-242.
- Harrison, Richard T. and Colin M. Mason, 2002, Backing the horse or the jockey? Agency costs, information and the evaluation of risk by informal venture capitalists, paper presented to the 22nd Babson College-Kauffman Foundation Entrepreneurship Research Conference, University of Colorado at Boulder, 6-8 June.
- Hindle, K. and R. Wenban, 1999, Australia's informal venture capitalists: an exploratory profile, Venture Capital: An international journal of entrepreneurial finance 1(2), 169-186.
- Kaiser, R., 2002, Angels scarce, but still hovering: entrepreneurs form alliances to smooth investor connections, Chicago Tribune, 11 November.
- Landström, H., 1992, The relationship between private investors and small firms: an agency theory approach, Entrepreneurship & Regional Development 4, 199-223.
- Landström, H., 1997, Synen på affärsmöjligheter - Informella riskkapitalisters beslutsriterier i samband med bedomningen av nya investeringsförslag (The view of business opportunities - Informal investors' decision criteria when evaluating new investment proposals), Scandinavian Institute for Research Entrepreneurship, Working Paper No. 3, SIRE, University of Halmstad, 301 18 Halmstad, Sweden.
- Mason, C., 2001. Report on Business Angel Investment Activity 1999/2000 (British Venture Capital Association, London, UK).
- Mason, C. and R. Harrison, 1994, The informal venture capital market in the UK, in A. Hughes, and D.J. Storey, eds.: Financing Small Firms (Routledge, London, UK), 64-111.
- Mason, C.M. and R.T. Harrison, 1999, Public policy and the development of the informal venture capital market: UK experience and lessons for Europe, in K. Cowling, ed.: Industrial Policy in Europe (Routledge, London, UK), 199-223.
- Mason, C.M. and R.T. Harrison, 2000a, Informal venture capital and the financing of emerging growth businesses, in D. Sexton and H. Landström, eds.: The Blackwell Handbook of Entrepreneurship (Blackwell, Oxford, UK), 221-239.

- Mason, C.M. and R.T. Harrison, 2000b, The size of the informal venture capital market in the UK, Small Business Economics 15, 137-148.
- Mason, C.M. and R.T. Harrison, 2000c, Investing in technology ventures: what do business angels look for at the initial screening stage, in P.D. Reynolds, E. Autio, C. Brush, W. Bygrave, S. Manigart, H. Sapienza and K. Shaver, eds.: Frontiers of Entrepreneurship Research (Babson College, Babson Park, MA), 293.
- Mason, C.M. and R.T. Harrison, 2002a, Barriers to investment in the informal venture capital sector, Entrepreneurship and Regional Development 14, 271-287.
- Mason, C.M. and R.T. Harrison, 2002b, Is it worth it? The rates of return from informal venture capital investments, Journal of Business Venturing 17, 211-236.
- Mason, C. and A. Rogers, 1997, The business angel's investment decision: an exploratory analysis, in D. Deakins, P. Jennings and C. Mason, eds.: Entrepreneurship in the 1990s (Paul Chapman, London, UK), 29-46.
- Mason, C.M. and M. Stark., 2004, What Do Investors Look For in a Business Plan? A Comparison of the Investment Criteria of Bankers, Venture Capitalists and Business Angels, International Small Business Journal 22, no. 3 (2004): 227-248.
- Meyer, R., R. Radosevitch, E. Carayannis, M. David and J. Butler, 1995. The National Census of Early-Stage Capital Financing (Orion Associates, Albuquerque, NM).
- Politis, D. and H. Landstrom, 2002, Informal investors as entrepreneurs – the development of an entrepreneurial career, Venture Capital: An international journal of entrepreneurial finance 4(2), 78-99.
- Private Equity Week, 1998. (Securities Data Publishing, New York, NY) 8 June, 5.
- PricewaterhouseCoopers/Venture Economics/National Venture Capital Association - Money Tree Survey, 2001, Venture capital investing survey: Quantifying what a long strange trip it's been, <http://www.pwcmoneytree.com/moneytree/index.jsp>.
- PricewaterhouseCoopers/Venture Economics/National Venture Capital Association - Money Tree Survey, 2002, Venture capital investment increases in Q4 for first time since mid-2000; 2001 finishes as 3rd strongest year for venture capital, <http://www.pwcmoneytree.com/moneytree/index.jsp>.
- Progressive Policy Institute, 1999, *The State New Economy Index*, <http://www.neweconomyindex.org/states/>.
- Reitan, B. and R. Sorheim, 2000, The informal venture capital market in Norway – investor

- characteristics, behaviour and investment preferences, Venture Capital: An international journal of entrepreneurial finance 2(2), 129-141.
- Riding, A., L. Duxbury and G. Haines, Jr., 1997, Financing enterprise development: decision-making by Canadian angels, conference proceedings for the Entrepreneurship Division of the Association of Management and International Association of Management, August 17-22.
- Sahlman, W., 1990, The structure and governance of venture capital organizations, Journal of Financial Economics 27, 473-524.
- Sapienza, H.J., S. Manigart and W. Vermeir, 1996, Venture capitalist governance and value added in four countries, Journal of Business Venturing 11, 439-469.
- Sohl, Jeffrey E., 1999, The early-stage equity market in the USA, Venture Capital: An international journal of entrepreneurial finance 1(2), 101-120.
- Sohl, J., 2003, The private equity market in the USA: lessons from volatility, Venture Capital: An international journal of entrepreneurial finance 5(1), 29-46.
- Sohl, J., forthcoming, The organization of the informal venture capital market, in Hans Landstrom ed.: Handbook of Research on Venture Capital, (Edward Elgar Publishers).
- Sohl, J.E. and J. Areson-Perkins, 2001, Current trends in the private equity financing of high tech ventures: an analysis of deal structure, in W. Bygrave, E. Autio, C. Brush, P. Davidsson, P. Green, P. Reynolds and H. Sapienza, eds.: Frontiers of Entrepreneurship Research, (Babson College, Babson Park, MA).
- Sohl, J., M. Van Osnabrugge and R. Robinson, 2000, Models of angel investing: portals to the early stage market, in P.D. Reynolds, E. Autio, C.G. Brush, W.D. Bygrave, S. Manigart, H.J. Sapienza and K.G. Shaver, eds.: Frontiers of Entrepreneurship Research, (Babson College, Babson Park, MA), 289.
- Sorheim, R. and H. Landstrom, 2001, Informal investors – a categorization with policy implications, Entrepreneurship & Regional Development 13, 351-370.
- Timmons, J.A. and W.D. Bygrave, 1997, Venture capital: reflections and projections, in D.L. Sexton and R.W. Smilor, eds.: Entrepreneurship 2000 (Upstart Publishing Company, Chicago, IL).
- Timmons, J.A. and H.J. Sapienza, 1992, Venture capital: the decade ahead, in D.L. Sexton and J.D. Kasarda, eds.: The State of the Art of Entrepreneurship (PWS-Kent Publishing Company, Boston, MA), 402-437.
- Van Osnabrugge, M., 1998. Comparison of business angels and venture capitalists: financiers

of entrepreneurial firms (Venture Capital Report, Oxford, UK).

Van Osnabrugge, M., 2000, A comparison of business angel and venture capitalist investment procedures: an agency theory-based analysis, Venture Capital: An international journal of entrepreneurial finance 2(2), 91-109.

Van Osnabrugge, M. and R. Robinson, 2000. Angel investing: matching start-up funds with start-up companies (Jossey-Bass, San Francisco).

Wetzel, W.E., Jr., 1983, Angels and informal risk capital, Sloan Management Review 24(4), 23-34.

Wetzel, W., 1986, Entrepreneurs, angels and economic renaissance, in R.D. Hisrich, ed.: Entrepreneurship, Intrapreneurship and Venture Capital (Lexington Books, Lexington, MA), 119-139.

Wetzel, W.E., Jr., 1987, The informal risk capital market: aspects of scale and efficiency, Journal of Business Venturing 2, 299-313.

Table I

Investments by stage (percentage)			
	2000	2001	p value
seed and start-up	51%	45%	0.667
early	39%	34%	0.71
later	9%	19%	0.308
n	25	26	

Table II

Primary matching methods (percentage)	
	2001
internet	11%
venture forums	38%
newsletter/magazine	0%
personal networking	32%
investor specified	
criteria	9%
other	11%
n=47	
p value	0.001

Table III

Yield rates (percentage)			
	2000	2001	p value
n	33	34	
yield	23.26%	10.79%	0.001

Table IV

Time to evaluate deal proposals (months)			
	2000	2001	p value
n=	24	29	
mean	3.3	4.1	0.109
variance	1.95	4.07	

Table V

Deal size invested vs deal size sought			
	funding sought	deal size	difference
1998			
n=	24	24	
mean	\$826,042	\$142,167	-\$683,875
median	\$500,000	\$75,000	-\$412,500
standard deviation	\$902,457	\$137,226	\$736,184
2001			
n=	24	24	
mean	\$1,134,375	\$806,042	-\$328,333
median	\$1,000,000	\$450,000	-\$287,500
standard deviation	\$1,224,341	\$1,175,284	\$861,296
p value (mean difference, 1998 vs 2001)		0.1304	