WORKING PAPER

Angel investing: changing strategies during volatile times

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Abstract

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. While business angels remain the leading source of seed capital for business ventures, and membership in angel portals continues to rise, valuations are in decline and women-led financing lags behind the overall market. Additionally, depressed yield rates and increased due diligence indicate that investors are retreating to more fundamental approaches.

Keywords: business angels; informal venture capital; angel market; private investor

1. Executive summary

Of the two major sources of private equity capital for high-growth business ventures—business angels and venture capital funds—business angels represent the oldest, and largest source of seed and equity capital (Harrison and Mason 2000; Sohl 2002). Changing conditions in the angel market, and why the angel market changed, provides key insights into some of the contributing factors of early stage investment resiliency and vulnerability during difficult economic periods. This longitudinal investigation into the business angel market attempts to offer a unique opportunity to further knowledge and understanding about angel investing in the US. 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 paper, a survey-based approach was employed for the 2000 and 2001 time periods. During these time periods investors appeared to change

their fundamental approaches toward private equity financing. Many experienced investors seemed to alter fundamental screening and due diligence methods during the expansion up to 2000, but retreated back to them during the contraction of 2001. Additionally, many new, and perhaps less sophisticated, investors entered the angel market during the drastic upswing leading to dramatic and unsustainable increases in investing levels. Both the relaxation of past risk-reducing methods and the rush of inexperienced investors seemed to fuel the unprecedented market upswing, as well as the eventual fallout. However, these dramatic experiences seemed to provide enough incentive for astute angel investors to retool their "new economy" approaches and retrench back to fundamental strategies.

This investigation comparing angel market activity and business angel investment behavior across significantly different periods allows for some interesting hypothesis development and testing. Our results reconfirmed that business angels prefer to invest in seed and startup stages of emerging entrepreneurial ventures. The data indicate 64% (for 2000) and 68% (for 2001) of angel portal investments were made in the seed and start-up stage of entrepreneurial ventures. Although many speculated that electronic communication technology would drastically change the approach to matching business angels with entrepreneurs, only 11% of angel portals indicated the use of the Internet as the primary matching method, and none reported that they would consider their organization to be an Internet-only operation.

When considering investment behavior during the height of the investment bubble in 2000, one would expect to see relatively high yield (acceptance) rates, defined as the ratio of investment opportunities that are brought to the attention of investors (by the angel organization)

that resulted in an investment during this time period. In 2000, the yield rate reached 23.3%, compared to 12% in 1997 and 14% in 1998 (Sohl, Van Osnabrugge and Robinson 2000). As conjectured, after the bubble in 2001, yields dropped to 10.79%. Further evidence, beyond yield rate observations, support the claim that investors retrenched during the contraction. Our results indicate that the respondents spent, on average, 25% more time (or four months) in 2001 investigating potential business proposals than they did in 2002, when they only averaged three months. Although investors may have retreated to more stringent investment analysis, the disconnect between what entrepreneurs were seeking for their business proposals and the size of the actual investment grew. In 1998, entrepreneurs, on average, estimate funding needs at the seed and start-up stage to be US$750,000 while the average dollars invested per deal were US$144,687, a difference of *-US$605,313* (Sohl, Van Osnabrugge and Robinson 2000). In 2001, entrepreneurs, on average, estimate funding needs at the seed and start-up stage to be US$1,441,279, but the average dollars invested per deal were US$806,042, a difference of *-US$667,467*. Furthermore, our analysis of deal valuations shows that market conditions do significantly influence the negotiated value of the venture. From 2000 to 2001 deal size seemed to decrease while the amount of equity investors received in exchange for their investment remained relatively constant. Additionally, analyzing sector preferences indicates that the overall angel market invests in a relatively diverse mix of high-tech industries.

Given the changes that resulted from the significant economic contraction and decline in private equity investment deals and dollars, one could speculate that the business angel market would experience a mass exodus of market participants. However, angel portal membership increased by 21% from 2000 to 2001, and increased 32% from 1998 to 2001. It is important to

note that while membership increased, 41% of investors had yet to make an investment in 2001, compared to 36% in 2000 and 32% in 1998. Women investors and women entrepreneurs seeking angel capital grew in 2001 from 2000 levels. However, comparing yield rates for women-led ventures with the yield rates of the overall angel market reveals that women-led ventures lag behind the general market. In addition, while the level of women angels has increased, the percentage of women in the angel population has remained stagnant.

2. 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 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 2002). 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-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 2002). 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 screening by the angel groups in the post expansion period? What has been the performance record of the overall industry and individual groups of investors since the market highs? 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.

3. **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 2002). 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). 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; Sohl 1999;

Mason and Harrison 2000a). These characteristics of private investors 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 2002). This gap has been interpreted as a consequence of market inefficiency (Wetzel 1986; Wetzel 1987). 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 flows very inefficiently. 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. However, the angel market has historically been one that conducts business on a face-to-face level for both deal sourcing (Freear, Sohl and Wetzel 1994a; Coveney and Moore 1998; Reitan and Sorheim 2000; Sorheim and Landstrom 2001) and investment decisions (Landstrom 1992; Fiet 1995; Harrison and Mason 2002). 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). Thus, the impact of electronic communication as a method to provide for more efficient investment proposal evaluations is worthy of investigation.

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 2002). 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 1994a). 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 2002). 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. They do, however, suggest 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.*

Due diligence may also 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 2002). 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). 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 measured in markets in contraction.*

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). 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). 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 2002). 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.

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

In the private equity market, the process of placing a value on the entrepreneurial venture is one of the most difficult undertakings for the business angel. Though difficult, valuation is important since the valuation influences the amount of equity the investor receives for the investment (Wright and Robbie 1998; Timmons and Sapienza 1992; Prasad, Bruton and Vozikis 2000). During the market upswing leading into 2000, valuations increased in both the angel and venture capital market. With the dollars invested by venture capitalists increasing more rapidly than the number of investments, this mismatch indicated a precipitous rise in deal valuations (Sohl 2002). In addition, the initial valuation significantly impacts the return on investment (Mason and Harrison 2002b). This is especially acute in the angel market since investing at the early stage implies that the venture, if successful, will attract follow-on rounds of equity financing from the venture capital industry. Each of these subsequent rounds requires an independent valuation. If the valuation at the seed or start-up stage is judged too high in subsequent rounds, the extent of stock dilution of the early stage investors becomes acute. Thus, accurate valuations take on added importance in declining markets due to the consequences of dilution. Unfortunately, rising markets, with the accompanying increased pressure and

competition to complete the deal, often result in increasing valuations, not because the deal is perceived to be of high value, but rather the competition to complete the deal has increased. As such, rising markets put upward pressure on valuations, not that the deals warrant higher valuations since the quality may, in fact, be inferior due to inexperienced entrepreneurs and investors entering the market.

H6: *Valuations, in general, are related closely to market volatility.*

Women-owned or women-led businesses are the fastest growing sector of new venture creation in the US, representing nearly 40% of all firms in the US (Gundry, Ben-Yoseph and Posig 2002). While there is significant research that investigates the role of gender in access to debt capital, there is little attention devoted to the relative success of female-led businesses in securing private equity capital (Greene *et al.* 2001). Despite the growth in female entrepreneurship, venture capital remains unfamiliar to most women entrepreneurs (Pratt 1998; Seegul 1998). In a comprehensive report of women business owners and venture capital, access to venture capital remains limited, in part, due to the persistence of myths including the lack of experience in high growth ventures, the lack of social contacts, and business proposals that are not in line with venture capitalists' funding criteria (Brush *et al.* 2001). In a survey of women entrepreneurs who presented business plans to venture capitalists, findings indicate that while some women are making significant inroads on the demand (equity seeker) side, the proportion of women receiving funding remains disproportionate to the number of women owning their own ventures and that the overall participation of women in the venture capital industry is extremely small (Brush *et al.* 2002). The research on women and equity capital has been almost

exclusively directed to the venture capital market. Unfortunately, this venture capital focus does not address the critical seed and start-up investing behavior of angels with respect to women entrepreneurs. In one of the few studies on women and angel capital, it appears that the major challenges for female entrepreneurs in securing financing is the development of an effective management team and developing an understanding of the angel investor (Amatucci and Sohl 2003). The purpose of this research, with respect to women-owned businesses, is not to uncover the reasons for the lack of equity financing, but to examine the success level of women-owned businesses in securing angel capital, and to examine this activity during the market rise (2000) and subsequent retrenching (2001). Did women-owned businesses lose any ground that they may have gained through the increased activity of the private equity market through the subsequent retrenching and is the difficulty in securing equity exacerbated in declining markets? These issues lead to the development of the following hypothesis:

H7: *Acceptance rate trends for women entrepreneurs seeking angel capital coincide with the angel market acceptance rate trends*.

Previous private equity market volatility has been marked by a rush to invest in a particular sector, only to see the sector decline due to a variety of reasons, including over valuation and too much money chasing too few deals. In the emerging hard disk drive industry during the period 1977 to 1984, researchers concluded that capital market excesses turned an opportunity into a disaster for private investors (Sahlman and Stevenson 1985). The explosive growth attracted entrepreneurs and their angel and venture capital investors. These start-ups developed and manufactured hard disk drives for use by computer system manufactures who did

not have the means or the desire to build hard disk drives themselves. A buoyant stock market for high tech IPOs enabled angels and venture capital investors to realize spectacular returns. These returns attracted new angels and venture capital investors, and as the availability of money increased, so did the pressure to find more hard drive deals to invest in. Unfortunately, the industry suffered a near collapse within a 12 month period. Over time, the disk drive became a commodity with low profit margins dictated by the end users and assemblers and the market experienced fierce competition (Bygrave *et al.* 2000). Recently, the dot com surge leading into 2000 resulted in a marked increase in private equity investing, in both the number of investors and the size of the investments, and followed many of the same patterns of the earlier hard drive disaster. Again, new and inexperienced investors and an oversupply of capital and dot com ventures contributed to the rapid collapse in the market (Sohl 2002). More recently, the new darling of the high tech sector is biotechnology, with new ventures and increased investments by the venture capital industry (Whitman 2002). Signs of a weakening in this sector are also beginning to appear, with approximately 25% of public biotechnology companies having less than a 12 month supply of cash (Barbaro 2002). While the venture capital market has a tendency to herd to one sector, this tendency is less prevalent in the angel market, although it is not immune to past excesses. Since angel investing represents the initial round of equity capital for many ventures, and focuses on the seed and start-up stage, a diversified angel market would be one desirable for sustainability and growth. There are indications that angels, as opposed to their venture capital counterparts, make investments across a wide range of industries (Mason 2001). Such diversified investment behavior is a signal of a market that has learned from the exorbitant 2000 upswing.

H8: *Angel investments represent a diversified market portfolio of high growth industries.*

In addition to a diversity of investments, an angel market that is growing at a sustainable rate is desirable from an economic development aspect. While being a high net worth individual is a necessary condition for being an angel investor, it is not the only condition. Generally, potential investors (high net worth individuals) can be segmented into three broad categories with respect to the angel market: active angels with experience investing in entrepreneurial ventures, potential investors with no venture investing history but who have the desire to enter the angel market, and uninterested potential investors who under no circumstances would consider investing in entrepreneurial ventures (Freear, Sohl and Wetzel 1994b). Given the decrease in net worth with the steady decline in the public equity markets since 2000, the salient question is whether the angel market is also in decline, in terms of the number of active angels and potential investors that are joining the angel portals. Also, if portal membership is in fact increasing, is the rate one which can be sustained? These issues lead to the formulation of the last hypothesis:

H9: *The angel market, in terms of portal membership, is in decline in the post 2000 period.*

4. Methodology

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. 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%. 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.

5. Analysis

5.1. *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. The data indicate that angels, through their membership in angel portals, continue to favor the early stages, with 64% of the 2000 angel portal investments, and 68% for 2001, in seed and start-up stage entrepreneurial ventures. 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 represent 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 2001). 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% (PricewaterhouseCoopers 2001) in 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 the major assets of the venture being the intellectual property of the entrepreneur. 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. 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. To ascertain the support for H2, 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 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% relying 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

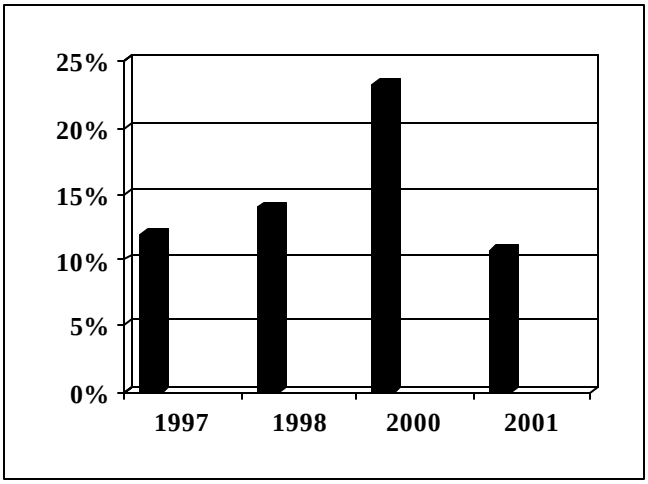
success of these high-risk ventures. In addition, the venture forums and personal networks offer a degree of vetting of the deal and thus help to increase the quality, as opposed to the volume, of the deal being offered. Further support for H2 is evident through the lack of widespread use of the Internet. 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.

5.2. *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 (Figure 1). In 2000, the yield rate reached 23.3%, which was

Figure 1 Yield Rates



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.

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, an entire extra month, or 25% more time, 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 three months, in 2000, to four months, in 2001. 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. In 1998, entrepreneurs, on average, estimated funding needs at the seed and start-up stage to be US$750,000 and the average dollars invested per deal are US$144,687, representing a discrepancy of *-US$605,313* (Sohl, Van Osnabrugge and Robinson 2000). In contrast, in 2001, entrepreneurs, on average, estimate funding needs at the seed and start-up stage to be US$1,441,279 and the average dollars invested per deal are US$806,042, representing a discrepancy of *-US$667,467*, based on the current survey results. Clearly, 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 exhibits little change. While the supplier of capital appears to have incorporated changing market

conditions into the subsequent investment behavior, 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 entrepreneurial funding estimates are in need of further calibration by the entrepreneur.

5.3. *Women in the market*

For women-owned businesses, there is much discussion concerning the level of success of women-owned businesses in securing equity capital. To contribute to the current knowledge base, data were collected with respect to women's participation in the private equity market as angel investors and entrepreneurs seeking angel capital. Regarding the participation levels of women investors, 22% of the angel portals in the study do not include any women investors as members. Twelve percent of the groups report an investor membership base that comprises at least 20% women and 7% of the angel portals are made up of at least half women members. One organization indicates that 98% of the membership is female. For both 2000 and 2001, the average percent of women membership in each portal is 12% (Table 1). Since angel membership

Table 1 Women in the Angel Market

	2000	**2001**	**growth**
Percent of Women Investors	12.3%	12.4%	21%
Percent of Women Entrepreneur Presenters	12.6%	12.2%	25%
Yield Rates - All	23.3%	10.8%	
Yield Rates – Women-led Ventures	11.3%	9.8%	

increased during this period, this constant 12% membership proportion indicates an underlying growth of 21% in women investor members. On the demand side, approximately 12% of all

investment opportunities brought to the attention of investors in 2000 and 2001 were women-led ventures (Table 1). The number of women-led investment proposals presented to investors increased by 25% percent from 2000 to 2001, compared to an increase of 29% for all investment proposals.

Analysis of yield statistics (the percentage of investment opportunities that are brought to the attention of investors that resulted in an investment) for women-led ventures seems to indicate that less women-led ventures were funded relative to the number presented to investors in relation to the overall population of proposals. Yield rates for women-led ventures were 11.3% for 2000 and 9.8% for 2001 (Table 1). This compares to the overall yield rates of 23.3% and 10.8% for 2000 and 2001, respectively. Thus, there appears to be little support for H7, a*cceptance rate trends for women entrepreneurs seeking angel capital coincide with market acceptance rate trends*. In 2000, women-led ventures appear to be lagging behind market yield rates by over 50%, assuming no discernable differences in venture characteristics between women and non-women led ventures. From 2000 to 2001, the market yield declined by 12.5%, while yields for women-led ventures declined by 1.5%. Thus, by 2001 yield rates for women-led ventures were more in line with overall market trends. However, in both years it appears that yield rates for women-led ventures lagged behind general market yield rates for angel portals, although this gap is less pronounced in 2001. The identification of the possible causes for this gap between yield rates is an interesting research topic unto itself.

5.4. *Angel market activity*

Overheated markets, followed by subsequent downturns, often have profound effects on market activity, from both a positive and negative perspective. It is surmised that the angel market is not immune to this cyclical behavior. To address these potential effects, three components of the angel market - valuation, sector investing and market participation - are examined. In rising private equity markets, increased pressure and competition to complete the deal may result in increasing valuations. These higher valuations may not be due to the fact that the deal is perceived to be of high value, but rather the competition to complete the deal has increased. As such, rising markets generally place upward pressure on valuations, not that the deals warrant higher valuations since the quality may, in fact, be inferior due to inexperienced entrepreneurs and investors entering the market. Two measures are calculated to examine the support for H6, v*aluations, in general, are related closely to market volatility.* At the individual member level, the total amount invested per deal is a direct reflection of valuation. As table 2

Table 2 Individual Investor Profile

Characteristics	**2000**	**2001**
Total $ Invested/year	$267,500	$134,792
Average $ Invested/deal/investor	$95,750	$49,807
Average Equity Received/deal	21%	23%

indicates, the average dollars invested, per deal (per individual), declined by approximately 50% from 2000 to 2001. However, deal price alone is only a partial proxy for deal valuation. More important to the determination of deal valuation is the amount of equity received. The size of the negotiated equity investment, coupled with deal size, is a direct reflection of the valuation of the entrepreneurial venture. From table 2, the average equity received per deal remained essentially

unchanged (21% to 23%). Thus, there appears to be support for H6, in that deal valuations appear to have decreased along with the declining market.

Previous private equity markets have been victims of excessive investing in one particular active sector, resulting in a decline in market diversification and allowing the markets to have excessive risk exposure based on the vagaries of a particular sector. Such sector dependent exposure was evident in the disk drive industry of the late 1970s, the dot com frenzy of 1998-2000 and more recently, the apparent rush to invest in biotechnology and nanotechnology. The angel market, which is essentially the farm system for the next wave of high growth investments, provides an opportunity to examine sector diversification. It is hypothesized that, contrary to current anecdotes, the excessives of the recent past have indeed led to a more diversified angel market. To gauge the extent of high tech sector diversification, data is collected on the range of industry preferences of the angel market, as indicated by the angel portal sector preference in screening and presenting deals to the members. As table 3 indicates,

Table 3 Sector Preferences - 2001

Software	16%
Electronic/Hardware	13%
Biotechnology	13%
Telecommunications	11%
Life Sciences	11%
Manufacturing	10%
Other Technology	15%
Retail	1%

there appears to be support for H8, *angel investments represent a diversified market portfolio of high growth industries*. Of the six high tech sectors identified, all have a range of preference between 10% and 16%, which appears to lend support for H8. The retail sector, which attracted

a less than 1% preference rating, is as expected, since angel investing has historically been largely associated with the high tech sector.

The angel market, which is in essence a collection of individual investors, needs to maintain a reasonable influx of new members to sustain the market. The key concept is the achievement of a sustainable growth rate. Based on the responses on portal membership, the angel investment market appears to be gaining in popularity. Respondents indicate that the number of individuals participating in angel groups is expanding. Angel portal membership increased by 21% from 2000 to 2001, and increased 32% from 1998 to 2001. From these data, it appears that there is not support for H9, *the angel market, in terms of portal membership, is in decline in the post 2000 period*. However, sustainable growth requires a reasonable augmentation in active investors, rather than just members of portals. Thus, level of participation is an important consideration. While the number of individuals that are members of angel portals appear to be greater than in the past, there is a larger percentage of latent angels (individuals who have the necessary net worth, but have never made an investment) in these groups. In 2000 and 2001, respondents indicated that 36% and 41%, respectively, of their angel members have not made an investment in corresponding years. This compares to 32% of investors in 1998. This increase in latent investors over time indicates that while many high net worth individuals may be attracted to the early stage equity market, they have not converted this interest into direct participation. Clearly, the market downturn may have an effect on this non-activity. In addition, the education necessary to move the potential angel to the active investor may also be lacking. Thus, membership in portals alone is not a direct indication of investment activity. As such, H9 receives only partial support.

6. Conclusion

The expansion of the private equity market leading up to 2000 and the subsequent downturn in 2001 provides a unique opportunity to increase the 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 stage 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 of 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 careful due diligence process and an increase in the scrutinization of investment opportunities, as indicated by a 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. An additional factor that reflects this retreat to fundamentals is the decline in valuations in the seed and start-up stage. This paper also examined some issues facing women-led ventures and found some mixed signals. Women participation as angels appears to be increasing at a sustainable rate, but women-led ventures are lagging behind with respect to successfully obtaining this equity capital. 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. The angel portals members are investing in a diverse portfolio of high tech industries, from a market perspective, with investments spread relatively evenly across high tech sectors. The angel market appears to be attracting new participants at a sustainable growth rate of around 20%, but there is concern on the attributes of this growth pattern. That is, while membership in angel portals is increasing, the type of member is being altered, with an increasing percentage of entrants representing latent angels. Thus, the quality and activity level of the individual members is the key indication of sustainable growth, rather than the addition of members in general.

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 portal organization 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.

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