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The results have several implications affecting small business owners, providers of capital, and policy-makers. First, many small business owners are relatively unfamiliar with many sources of capital that are used to fund growth. Second, owners of small technology-based firms indicate low familiarity with government financing programs. Third, owners of small technology-based firms in smaller communities are less familiar with sources of capital commonly used to finance growth. Fourth, owners of small technology-based firms are relatively unfamiliar with methods of bootstrap financing.

Disciplines

Business Administration, Management, and Operations | Entrepreneurial and Small Business Operations

Comments

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**THE FAMILIARITY OF SMALL TECHNOLOGY-BASED
BUSINESS OWNERS WITH SOURCES OF CAPITAL:
IMPACT OF LOCATION AND CAPITALIZATION**

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ABSTRACT

This paper examines issues related to the acquisition of capital by a sample of 142 small technology-based firms. Specifically, the study investigates the relationship between owners of small technology-based firms' familiarity with the alternative sources of capital and (1) location of the business and (2) amount of capital raised by the business. The results show that familiarity with alternative sources of capital is affected by the location of the business and amount of capital raised by the company.

The results have several implications affecting small business owners, providers of capital, and policy-makers. First, many small business owners are relatively unfamiliar with many sources of capital that are used to fund growth. Second, owners of small technology-based firms indicate low familiarity with government financing programs. Third, owners of small technology-based firms in smaller communities are less familiar with sources of capital commonly used to finance growth. Fourth, owners of small technology-based firms are relatively unfamiliar with methods of bootstrap financing.

INTRODUCTION

Traditional finance theory assumes that the goal of the firm is to maximize the wealth of the owners. Finance theory asserts that value is maximized through increasing the size of cash flows and/or decreasing the risk associated with the cash flows. Variables having an important impact on value maximization include those affecting the risk and return characteristics of the firm. Finance theory states that firms will be rewarded by maximizing returns or minimizing risk by a greater investor demand for ownership in the firm and, resultantly, higher market value for the firm. Brophy and Shulman (1992) emphasize the relevance of finance theory in the field of entrepreneurship. The development of finance models, including the Capital Asset Pricing Model and Arbitrage Pricing Model, provide insight into the relationship between risk and return in the context of valuation that can be useful to entrepreneurs (Brigham & Gapenski, 1996).

Much of the theory underlying value maximization relies on the assumptions associated with perfect capital markets (Petty & Bygrave, 1993). These assumptions include, for example, homogenous expectations, zero transaction costs, infinitely and perfectly divisible

investments, and perfect information (Brigham & Gapenski, 1996). While these assumptions may be valid for large public companies, the application of these assumptions to small firms has often been questioned in the literature. Ang (1991) discusses financial issues that are different for small firms as compared to large firms. These issues include (1) greater agency problems arising from type of ownership (*i.e.* sole proprietorships and partnerships have no agency problems and firms with separation of ownership and management have agency problems) and higher monitoring costs associated with debt, (2) information problems arising from asymmetric (different information available to different groups) information, (3) high failure costs, (4) differences in taxation and (5) high transaction costs resulting in limited access to alternative sources of capital.

Small firms' lack of access to the capital markets and information about financing alternatives are important violations to the perfect capital market assumptions. These violations are especially important for technology-based firms for several reasons. Product development and marketing are often very lengthy and expensive for technology-based firms. In addition, owners of technology-based firms often have technology/science backgrounds and limited knowledge of financial management issues. The impact of these limitations may be more significant for technology-firms that are located in smaller communities and have raised limited amounts of capital.

This paper presents the results of a study that examines the relationship between the owners of small technology-based firms' familiarity with alternative sources of capital and the firm's (1) location and (2) capitalization. A better understanding of the issues associated with the financing of technology-based companies may be beneficial due to their growing role and importance in the US economy. The results of the study can be used by service providers and consultants who assist owners of technology-based firms in their search for capital. The results of the study also can be incorporated into college curriculum to provide students with insight into the acquisition of capital, especially for technology-based firms.

The next section of the paper presents background material on small firm financing. Research issues are examined in the study followed by the presentation of the methodology used in the analysis. The results are presented and conclusions are drawn.

SMALL FIRM FINANCING

Finance Theory

The acquisition of capital has traditionally been one of the most difficult aspects of launching, operating, and growing a small firm. The lack of capital may lead to cash flow shortages, inability to pursue market opportunities, and failure. Landstrom (1992) uses agency theory to show that asymmetric information results in small firms having greater difficulty in raising capital as a result of higher monitoring costs, bonding costs, and residual loss potential as compared to larger firms. Emery and Finnerty (1997) emphasize that financing structure provides a signal to providers of capital about the risk and return characteristics of the firm. Signals by the owners provide information to providers of capital about the future strategies that the firm intends on implementing and thus, can have an important impact on the potential sources and availability of capital.

The goal of wealth maximization dictates a financing structure that is consistent with the traditionally defined risk-return relationship. Petty and Bygrave (1993) point-out that the goals of the firm may vary according to the type and characteristics of the firm. McMahon and Stanger (1995) state that the traditional objective of the firm is oversimplified and not an accurate reflection of the goals of the owner of the small firm. Ang (1992) states that the

objective of the firm may be quite complicated and depend on organizational characteristics. The objectives of owners of smaller firms may be a combination of profit, long term value creation, taxation, family issues, and career independence.

Capital acquisition among small firms is affected by numerous factors, including economic conditions, credit history, type of business, current financial characteristics and owner's preferences (Chaganti, DeCarlos & Deeds, 1995). Petty and Bygrave (1993) believe that the maturity and owner's objectives are important influences on a small firm's capital structure.

Sources of Capital

Small firms have traditionally acquired start-up capital from either personal savings or loans from lending institutions. When traditional sources of capital are not available, owners often use bootstrap financing, or "highly creative ways of acquiring the use of resources without borrowing money or raising equity financing from traditional sources" (Freear, Sohl, & Wetzel, 1995). Bhide (1992) believes that the ability to locate bootstrap financing identifies entrepreneurial spirit. Other sources of start-up capital may include friends and relatives, sale of personal assets, home equity, cash value of life insurance, issuance of stocks/bonds, credit cards, leases, government grants, research and development/manufacturing loans, customers and suppliers (Van Auken & Neeley, 1996).

Ongoing operations are commonly financed through profitability. Profits that are reinvested in the firm, especially growing firms, can be an important source of capital during the earlier years of operation. Reinvested capital enables the firm to fund growth without accessing external funds. Maintaining strong profit margins after paying cost of goods sold, overhead costs, and owner's compensation is important (Emery & Finnerty, 1997).

One of the more challenging issues facing successful firms is negotiating and obtaining growth capital through informal and/or formal venture capitalists. Most firms are unsuccessful in attracting venture capital and must pursue other strategies to raise capital. Firms seeking investment from venture capitalists should recognize important differences between informal investors and formal venture capitalist investors (Timmons, 1997). For example, the informal venture capital market consists of a diverse set of investors who invest in high-risk, high potential return ventures that are often in the early stages of development. In addition, informal venture capital investors typically invest smaller amount of capital than do formal venture capitalists. Formal venture capital firms prefer to invest in firms that are in later stages of development than informal venture capital investors (Busenitz & Fiet, 1996; Freear, Sohl, & Wetzel, 1995).

Capital Acquisition Constraints

The constraints that entrepreneurs confront in raising capital arise from several problems. First, many entrepreneurs are not knowledgeable in business disciplines and the financial management of a firm. As a consequence, some entrepreneurs may accept greater business and financial risks than the potential rewards from the business. In addition, an entrepreneur's high need for control and desire to avoid accountability can result in the development and implementation of poor operational and financial strategies. These entrepreneurs may not recognize or accept a signal from providers of capital about the weakness of their proposed business concept and be unwilling to change their initial business concept (Ang, 1992; Ang, 1991).

A second group of problems is related to the quality and characteristics of the proposed business concept. Adverse reaction to the business idea from potential lenders or investors

may occur due to the entrepreneur's inexperience, inadequate information on the proposed business, high cost of financing smaller requests, and high risk (Petty & Bygrave, 1993; Ang, 1991; McMahon & Holmes, 1991). Capital structure decisions can also be affected by the owners' preference for debt that results from the tax shield associated with the debt capital (Norton, 1991).

A third issue concerns the availability of information. Gibson (1992) believes that finance theory associated with the acquisition of capital by small firms requires modification due to the lack of information about alternative sources of capital by owners of small firms. This information asymmetry increases the risk of and reduces the flow of funding to small firms (Landstrom, 1992). Holmes and Kent (1991) refer to the limited awareness of capital alternatives in the context of a financing gap or "knowledge gap". Technology-based firms in a relatively early stage of development may find great difficulty in obtaining capital due to the risks associated with the development of technology-related products and the transfer of product into the market. The high research and development costs and long lead-time in bringing the product to the market make start-up technology firms very high risk investments. As a result, technology-based firms often have great difficulty in acquiring capital, especially in the early stages of the product development (Mason & Harrison, 1995).

RESEARCH QUESTIONS

The efficiency of the capital market is affected by the flow of information to both users *and* providers of capital. Less efficient capital markets lead to greater difficulty in capital acquisition and higher costs of capital. Ultimately, firms may experience cash flow and liquidity problems. These problems can be especially challenging for new technology-based firms that commonly experience long product development times, high risk in commercialization of new technology, and, as a result, causing difficulty in raising capital. Location and capital acquisition experience of the firm may be an important factor affecting the familiarity with financing alternatives and placing constraint on capital acquisition.

Research Question #1: Are owners of small technology-based firms who are located in smaller communities (<25,000 people) less familiar with alternative sources of capital than owners of small technology-based firms who located in larger communities (>25,000 people).

One of the basic assumptions underlying much of finance theory is that information is widely and freely accessible to all market participants (Emery & Finnerty, 1997). Owners of technology-based firms in smaller communities may be less informed and, thus, less familiar with alternative sources of capital than owners of small technology-based firms in larger communities. On the other hand, owners of technology-based firms located in smaller communities may be fully utilizing information technology and the expertise of service providers to gain access to and become more familiar with alternative sources of capital. Van Horn and Harvey (1998) emphasize the difficulties of acquiring information by small firms located in small communities. The unfamiliarity with alternative sources of capital may be the result of poor dissemination of information, lack of sophistication, and/or lack of expertise among both providers of capital and business consultants in smaller communities. In addition, firms in smaller communities may be more isolated, have less visibility and, thus, attract less attention by providers of capital than firms in larger communities. Lang, Calantone and Gudmundson (1997) believe that small firms must rely on external expertise, often not available in small communities, when developing business strategies. Saxenian (1990) states that the success of small technology-based firms is negatively impacted by the lack of information that occurs from geographic isolation. Deeds, Decarolis and Coombs (1997)

found that geographic clustering of firms in the biotechnology industry increased firms' access to the capital.

Research Question #2: Are owners of small technology-based firms who have raised smaller amounts of capital (<\$1,000,000) less familiar with the alternative sources of capital than owners of small technology-based firms who have raised larger amounts of capital (>\$1,000,000).

Owners of small technology-based firms who have raised smaller amounts of capital may have less experience with the acquisition of capital as compared to owners of small technology-based firms who have raised greater amounts of capital. As a consequence, the less experienced owners may have a weaker understanding of and be less sophisticated with the alternative sources of capital than owners of larger technology-based firms. However, the experience associated with capital acquisition may not improve the understanding of alternative sources of capital, but only provide owners with an understanding of the capital acquisition process. Callahan and Cassar (1995) found that owners of smaller firms (as compared to larger firms) were less sophisticated and used less market information in making decisions. The constraints resulting from inexperience in the use and access of information affects the ability of the firm to raise capital. Petty and Bygrave (1993) found that owner's experience directly impacted the ability to raise funds from the alternative providers of capital.

SAMPLE AND METHODOLOGY

Sample and Questionnaire Development

A sample of 500 small technology-based businesses was provided by the Small Business Development Center (SBDC) located in a Midwestern state. The sample was constructed by the SBDC as part of an effort to identify the scope and nature of small technology-based firms in the state. Questionnaires were mailed to each of the 500 companies during October 1998. After two weeks, a second questionnaire was mailed to non-respondents. A total of 142 usable questionnaires were returned, resulting in a 28.4% response rate.

The questionnaire was organized into two sections. The first section collected demographic information on respondent firms (legal structure, community size, and total capitalization). The second section collected information on sources of capital used to finance the business (personal equity, stock, bonds, loans from financial institutions, loans from finance companies, factoring, credit card, suppliers, customers, leasing, R&D, government programs, venture capital, individual investors, and other). In addition, respondents were asked to indicate their familiarity with each source of capital using a 1 (very familiar) to 5 (not familiar) scale.

Methodology

The data were initially analyzed using univariate statistics to evaluate the characteristics of the sample using means and frequencies. Subsequently, the sample was segmented into two groups. Each grouping corresponded to a research issue that was being examined. The first partitioning of the sample was based on community size (< 25,000 people and > 25,000 people). The second partitioning of the sample was relative to total capitalization (<\$1,000,000 and >\$1,000,000).

Wilcoxon two sample tests of the difference between means were examined for each of the two sample groupings (community size and total capitalization) relative to the owners'

familiarity with the various sources of capital. Owners were classified as being familiar with the source of capital if they ranked familiarity with the source of capital as 1, 2, or 3 and were classified as being unfamiliar with the source of capital if they ranked familiarity as 4 or 5. Finally, the familiarity with each source of capital was combined into a single variable (familiarity with capital) that was used to measure the respondents' overall familiar with capital. A logit regression analysis was performed to determine whether size of community or total capitalization had a greater impact on familiarity with capital:

$$\text{Familiarity} = a + b_1 \text{ Size of Community} + b_2 \text{ Total Capitalization}$$

These variables are operationalized in the following manner:

<i>Familiarity:</i>	Respondents' overall familiarity with sources of capital
<i>Size of Community:</i>	1 = <10,000
<i>(Population)</i>	2 = 10,001-25,000
	3 = 25,001-50,000
	4 = 50,001-100,000
	5 = >100,000
<i>Total Capitalization:</i>	1 = <\$100,000
	2 = \$100,001-\$500,000
	3 = \$500,001-\$1,000,000
	4 = >\$1,000,000

In addition, Spearman correlations between the independent variables (Size of Community and Total Capitalization) were calculated to determine the degree of relationship between the variables. No significant correlations were present.

RESULTS

Business Characteristics

Table I shows the demographic characteristics of the sample firms. The majority of firms (64.1%) were organized as C-corporations and S-corporations (29.6%). The remaining firms were organized as partnerships (3.5%), sole proprietorships (1.4%) and limited liability companies (1.4%). The very high percentage of firms organized as corporations may be due to the limited liability aspects of being incorporated, which may be especially relevant for technology-based. Most respondent firms (78.9%) sold products and services (14.1%). The remaining firms offered consulting (2.1%) and other (4.9%).

Approximately 43.7% of the firms were located in communities having a population of less than 10,000, 12.0% in communities 10,001 – 25,000, 15.0% in towns 25,001 – 50,000, 8.5% in cities 50,001 – 100,000 and 20.4% in cities >100,000. Approximately 27.3% of the firms began operations within the last five years, and approximately 20.2% began operations more than 10 years ago. About one-half (52.5%) of the firms began operations between 6-10 years ago. Finally, Table 1 shows that about 10.4% of the firms raised less than \$100,000 since operations began. Approximately 25.9% raised \$100,001-\$500,000, 17.8% between \$500,001-\$1,000,000, and 45.9% more than \$1,000,000 of total capital.

Variable	Percent of Sample
<i>Type of Firm</i>	
Products	78.9
Services	14.1
Consulting	2.1
Other	4.9
<i>Type of Ownership</i>	
Corporation	64.1
S-Corporation	29.6
Partnership	3.5
Sole Proprietorship	1.4
Limited Liability Company	1.4
<i>Age of Firm (Years)</i>	
< 6	27.3
6 - 10	52.5
>10	20.2
<i>Community Size</i>	
<10,000	43.7
10,001-25,000	12.0
25,001-50,000	15.0
50,001-100,000	8.5
> 100,000	20.4
<i>Total Capital Raised</i>	
<\$100,000	10.4
\$100,001-\$500,000	25.9
\$500,001-\$1,000,000	17.8
> \$1,000,000	45.9

Sources of and Familiarity with Capital

Table II shows the sources, mean usage, and standard deviation of means of start-up capital used to fund operations. The table shows that personal equity (31.32%) and loans from financial institutions (26.63%) were the most common sources of start-up capital. This distribution of capital is consistent with previous studies of start-up financing (see Van Auken & Carter, 1989). Issuance of stock (11.51%), investment from individual investors (5.03%) and other unspecified sources of capital (4.85%) were also relatively common sources of start-up capital. All other sources of start-up capital were used infrequently. The large standard deviations of many of the sources of capital indicated wide variation in usage. Small firm financing is often tailored to the objectives of the owner and characteristics of the firm and, thus, the contribution of alternative sources of capital varies by firm. (Timmons, 1999).

Table III, which shows the means of the owners' familiarity with each source of capital (1 = very familiar and 5 = not familiar), indicates that the respondents are most familiar with sources of capital that are traditionally associated with small firms. These sources include loans from financial institutions (1.66), supplier credit (2.28), SBA guaranteed loans (2.43), and leasing (2.48). The respondents also indicated moderate familiarity with capital investment from private investors (2.53), perhaps due to the large extent to which private investors (i.e., angels) provide capital to technology-based firms (Freear, Sohl, & Wetzel, 1995). Owners were somewhat less familiar with stocks (2.54), asset-backed loans (2.82) and customer-based financing (2.88). The results also indicate a relatively low mean ranking of familiarity with government programs (state programs = 3.45, local programs = 3.45 and federal programs = 3.56) at all levels. These low rankings are especially revealing in the

context of the important role of government backed financing programs. Finally, the owners were least familiar with factoring (3.57) as a source of capital.

Table II: Mean and Standard Deviation of Source of Capital (%)
(n = 142)

Source of Capital	Mean (%)	Standard Deviation
Personal Equity	31.32	36.26
Loan from financial institution	26.63	31.31
Stock	11.51	11.50
Private investor	5.03	15.20
State government programs	3.25	12.30
Venture capital	2.53	14.54
Loan from finance company	2.47	9.62
Customer	1.73	11.23
Leasing	1.20	4.23
Credit card	0.11	0.72
Supplier	1.79	7.99
Research and development	0.46	5.05
Bond	0.39	3.26
Local government programs	0.27	12.30
Federal government programs	0.04	0.41
Other	4.85	18.96

Table III: Familiarity with Sources of Capital

Source of Start-up Capital	n	Mean Ranking
Loan from financial institution	139	1.66
Supplier credit	137	2.28
SBA guaranteed	139	2.43
Lease	140	2.48
Private investor	139	2.53
Stock	140	2.54
Asset lending	137	2.82
Customer	138	2.88
Venture capital	139	3.10
Third party	137	3.13
Bond	138	3.13
State government programs	138	3.45
Local government programs	138	3.45
Federal government programs	138	3.56
Factoring	138	3.57

Statistical Tests

Table IV shows the results of the Wilcoxon two sample tests of differences between means of familiarity with sources of capital relative to size of community (<25,000 population versus >25,000 population) in which the firm is located. The table shows that owners of technology-based firms in smaller communities are less familiar with almost all sources of capital than owners of firms in larger communities. More specifically, owners in smaller communities are significantly less familiar with stocks, investment from another company, federal government programs, venture capital, and investment from private investors. In all case, owners in larger communities are significantly more familiar with sources of capital than owners in smaller communities.

Variable	Community Size: (Small=<25,000 Large=>25,000)	n	Mean Response
Stock	Small	78	2.88
	Large	62	2.11 **
Bond	Small	76	3.47
	Large	62	2.71 **
Supplier credit	Small	76	2.30
	Large	61	2.26
Customer	Small	77	3.01
	Large	61	2.72
Factor	Small	77	3.73
	Large	61	3.36
Asset lending	Small	76	2.97
	Large	61	2.62
Loan from financial institution	Small	78	1.59
	Large	61	1.75
SBA guaranteed	Small	78	2.47
	Large	61	2.38
Lease	Small	78	2.58
	Large	62	2.35
Investment from other company	Small	76	3.46
	Large	61	2.72 **
Federal government programs	Small	77	3.79
	Large	61	3.26 **
State government programs	Small	77	3.61
	Large	61	3.25
Local government programs	Small	77	3.49
	Large	61	3.39
Venture capital	Small	77	3.45
	Large	62	2.66 **
Private investor	Small	77	2.79
	Large	62	2.21 **

* Significant at 1%

** Significant at 5%

The results in Table IV provide several general implications. First, the results provide evidence on whether owners of small technology-based firms are more or less familiar with several sources of capital than owners of small technology-based firms in larger communities (Research Issue #1). The results show statistical differences in familiarity with several sources of capital that are commonly used to finance growth. Thus, firms in the smaller communities may face limitations on growth due to the owner's lack of understanding of

financing alternatives. This result supports the concept that market inefficiencies in raising capital may exist due to the lack of information about the alternative sources of capital that may be available. Second, the results suggest that owners of technology-based firms in small communities are equally familiar with several of the traditional sources of capital used to fund small firms as are owners in larger communities. Sources such as loans from financial institutions, personal savings, supplier credit, etc. are commonly used by all firms during the initial stages of operations.

Table V shows the results of Wilcoxon two sample tests of difference in means of familiarity with several sources of capital relative to total capitalization (0 = less than \$1,000,000 and 1 = greater than \$1,000,000). The general trend in the table shows that owners of small technology-based firms who have raised smaller amounts of capital are less familiar with the several alternative forms of capital than owners who have raised greater amounts of capital. More specifically, the owners who have raised smaller amounts of capital are significantly less familiar with capital from supplier credit, customer financing, asset-based loans, factoring, state government programs and local government programs than owners who have raised larger amounts of capital.

**Table V: Familiarity with Sources of Capital Relative to Total Capitalization:
Wilcoxon 2-Sample Test of Difference in Means**

Variable	Capitalization (Lower=<1,000,000 Higher=>1,000,000)	n	Mean Response
Stock	Lower	73	2.67
	Higher	61	2.33
Bond	Lower	72	3.35
	Higher	60	2.82 *
Supplier credit	Lower	71	2.46
	Higher	60	1.97 **
Customer	Lower	71	3.10
	Higher	61	2.51 **
Factor	Lower	72	3.88
	Higher	60	3.10 **
Asset lending	Lower	72	3.00
	Higher	59	2.46 **
Loan from financial institution	Lower	72	1.72
	Higher	61	1.54
SBA guaranteed	Lower	72	2.47
	Higher	62	2.26
Lease	Lower	73	2.53
	Higher	61	2.34
Investment from other company	Lower	71	3.31
	Higher	60	2.92
Federal government programs	Lower	72	3.76
	Higher	60	3.30
State government programs	Lower	72	3.63
	Higher	60	3.17 *
Local government programs	Lower	72	3.72
	Higher	60	3.05 *
Venture capital	Lower	73	3.21
	Higher	60	2.92
Private investor	Lower	73	2.60
	Higher	60	2.43

* Significant at 1%

** Significant at 5%

A moderating influence on differences in familiarity may be differences or similarities in the distribution of sources of capital by amount of capital raised. For example, the distribution of sources of capital between firms that raised large amounts as compared to firms that raised small amounts of capital may be similar. Similarities in the distribution of sources of capital may result in similar uses and familiarity.

To investigate this issue, a Wilcoxon 2-sample test of difference in means between sources of financing versus size of firm was completed. Size of firm was measured using amount of total capital acquired since firm was launched (< \$1,000,000 and > \$1,000,000). The only statistically significant difference in mean values between firms that raised less than \$1,000,000 and greater than \$1,000,000 was for common stocks. Firms that acquired more capital used significantly more common stock in their capital structure than firms that acquired less capital. Few differences in distribution of sources of capital by size does not necessarily suggest that there would be no differences in familiarity. The experience gained through acquiring capital (all types of capital) would add to the knowledge base of the owners about the characteristics of and familiarity with sources of capital. The more that owners interact with providers of capital (which would occur as more capital is acquired) to explore issues related to capital acquisition, the greater their understanding of the sources of capital. Greater experience with capital acquisition would be expected to result in greater understanding of the sources of capital and familiarity with the sources of capital.

The results shown in Table V have several implications. First, the results provide evidence on whether owners of technology-based firms who raised larger amounts of capital are more or less familiar with sources of capital than are owners who raised smaller amounts of capital (Research Issue #2). Owners who raised smaller amounts of capital are generally less familiar with bootstrap sources of capital than are owners who raised greater amounts of capital. Second, the results indicate that owners who raised lesser amounts of capital are less familiar with state and local government programs than are owners who raised greater levels of capital. Third, the results suggest that owners are generally less familiar with the sources of capital commonly used to financing growth (*i.e.* venture capital, capital from private investors, and investment from another company) than sources of capital typically used to start-up and run operations (*i.e.* loans from financial institutions, supplier credit, and SBA guaranteed loans). These findings suggest that owners who have less experience in raising capital may be overlooking sources of funds that might be available to fund operations. Capital constraints may be due to lack of information about availability as well as limitations on availability of capital.

The data were evaluated using logit regression analysis to determine whether size of community or total capitalization had a relatively greater impact on the respondents' familiarity with capital. The correlation analysis shown in Table VI shows that size of community and total capitalization are not significantly correlated and, thus, measure different attributes of familiarity.

	Capital	Size
Capitalization	1.0	-0.0223 (0.797)
Community Size	-0.0223 (0.797)	1.0

The results of the logit regression analysis are shown in Table VII. Both independent variables (size of community and total capitalization) are significant at 1%. The positive coefficients indicate a direct relationship between familiarity and (1) size of community and (2) total capitalization. The larger (smaller) the community size and levels of capital acquired, the more (less) familiar that respondents' are with the sources of capital. Size of community and total capitalization appear to be relatively equally important factors affecting respondents' familiarity with capital.

Dependent Variable	Independent Variable	Regression Coefficient	χ^2
Familiarity	Community Size	0.3275	11.1004*
	Capitalization	0.4380	8.9239*

* Significant at 1%

SUMMARY AND DISCUSSION

Previous research emphasized the difficulty associated with the acquisition of capital by small firms (Ang, 1991, 1992). The discussion in the literature has suggested that the difficulty of raising capital may be attributable to high agency and high transaction costs (Landstrom, 1992). Another explanation for the difficulty of raising capital may be the lack of sophistication and knowledge about alternative financing sources among small business owners. The lack of sophistication and knowledge may be especially relevant for owners of small technology-based firms that face long product development times and high research and development costs.

The study results have several implications for owners of small technology-based firms, providers of capital, and policy-makers. First, the results suggest that small technology-based business owners are relatively unfamiliar with many of the sources of capital that are used to fund growth. This unfamiliarity with sources of growth capital may be an important constraint on the ability of the firm to successfully continue product development, transfer products to the market, and grow. On the other hand, the results indicate a relatively high degree of familiarity with many of the traditional sources of capital. This is not surprising since these traditional sources of capital are commonly used to launch and fund operations of most types of firms.

This first implication provides an opportunity for service providers and consultants who assist technology-based firms with their acquisition of capital. The acquisition of capital by new technology-based firms is time consuming, sometimes requires specialized insight into the capital acquisition process, and often is facilitated through networks/contacts. Service providers and consultants who are familiar with these issues may bring value to technology-based firms by providing advice on the appropriate sources of capital, where to look, how to approach providers of capital, etc. Reliance on consultants to navigate through capital acquisition may be beneficial in that owners can focus on product development and internal

management issues. Knowledgeable consultants can help firms avoid costly and time consuming mistakes.

A second implication of the study is the low familiarity with all sources of government financing programs. Government financing initiatives directed at assisting small technology-based firms may have limited effectiveness without business owners being familiar with and understanding the programs. The results suggest that information on federal, state, and local government sponsored programs may not be effectively disseminated among the small technology-based business community.

Third, the results show that owners of small technology-based firms in small communities are less familiar with sources of capital commonly used to finance than owners located in larger communities. Unfamiliarity with these sources of capital may be an important constraint affecting the growth potential of firms in the small communities. Such a finding is especially important given the decline in small communities' populations and in economic viability in Midwestern states.

The third implication should be interpreted with some caution. If all firms have a similar distribution of capital in their capital structure, then an argument could be made that familiarity with sources of capital would not vary with firm size. However, this does not account for the knowledge about the alternative sources of capital through the process of capital acquisition. The experience gained through capital acquisition would add to the knowledge base of the owners about the characteristics and, thus, familiarity with all sources of capital. The more that owners interact with providers of capital (which would occur as more capital is acquired) to explore issues related to capital acquisition, the greater their understanding of the sources of capital. Greater experience with capital acquisition would be expected to result in greater understanding of the sources of capital and, also, familiarity with the sources of capital.

Additionally, some firms may locate in smaller communities because they do not require large amounts of capital. Owners of firms that anticipate raising large amounts of capital (growth firms) may decide to start operations in larger communities that have better networking opportunities, greater visibility, and better access to capital. Owners of firms having a slow growth (life-style firms) strategy may decide to locate in small communities since access to large amounts or specialized forms of capital would not be anticipated. Evaluation of the relationship between level of total capitalization and community size in this study, however, revealed no statistically significant relationships.

The fourth implication is concerned with the unfamiliarity with bootstrap financing among the firms that have raised smaller amounts of capital. Unfamiliarity with bootstrap financing can be a constraint on the firm's financing flexibility in all stages of development, especially during periods of illiquidity arising from seasonal fluctuations, growth, or unexpected events.

The study has several limitations that affect the interpretation of the results and provide insight into areas for further research. For example, the study was completed using a relatively small sample in a single geographical area during a single time period. Other studies could be completed in other locations focusing on different areas of the country or population densities. A longitudinal study could reveal changes over time in financing patterns, familiarity with alternative sources of capital, effectiveness of the dissemination of information about financing alternatives, understanding of government-backed initiatives, and knowledge about new financing developments. A larger sample that is national in scope could provide greater insight into these types of differences.

Finally, the study did not specifically examine the relationship between type of product or service offered and capitalization. Some firms (such as manufacturing or new technology

firms) require larger amounts and different forms of capital than other firms, such as consulting or service firms. A future study could examine capitalization by major activity of firm versus familiarity with sources of capital. The insight gained from this analysis may provide insight into the life cycle nature of capital acquisition as well as the evolving impact that familiarity with capital on capital acquisition. Additionally, the study did not explicitly examine how the experience gained through raising capital affected the usage of capital over time. A longitudinal study of capital acquisition could provide additional insight into how experience with raising capital affects financing choices as the firm matures.

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