

## MODELING THE RELATIONSHIP BETWEEN NETWORKING AND FIRM PERFORMANCE

*John Watson: The University Of Western Australia, Crawley Wa, Australia*

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**Contact:** John Watson, The University of Western Australia, School of Economics and Commerce, 35 Stirling Highway, 6009 Crawley WA, Australia, (T) 61 8 6488 2876, (F) 61 8 6488 1047, Email: John.Watson@uwa.edu.au

### ABSTRACT

Network theory suggests that successful business ownership might depend on the ability of owners to gain access to resources not under their control in a cost effective way through networking. To date, however, there has been little empirical support for this proposition, particularly for established firms. The results of this study, based on a large longitudinal database, indicate a significant positive relationship between networking (particularly with formal networks such as external accountants) and both firm survival and, to a lesser extent, growth, but not ROE. Further, network intensity is found to be associated with survival and network range with growth.

### INTRODUCTION

Network theory suggests that the ability of owners to gain access to resources not under their control in a cost effective way through networking can influence the success of business ventures (Zhao and Aram 1995). Florin et al. (2003) suggested that networking can provide value to members by allowing them access to the social resources embedded within a network; that is, networking can provide the means by which small and medium enterprise (SME) owners can tap needed resources that are 'external' to the firm (Jarillo 1989). Julien (1993) observed that this form of cooperation can facilitate the achievement of economies of scale in small firms without producing the diseconomies caused by large size. Using networks can, therefore, potentially lower a firm's risk of 'failure' and increase its chances of 'success'.

However, although the arguments in favor of networking appear compelling, and most of the existing literature is premised on the belief that networking is beneficial (Havnes and Senneseth 2001), there has been little empirical evidence to date of an association between firm performance and the owner's use of networks, particularly for established businesses. Indeed, Aldrich and Reese (1993) were unable to find any evidence linking an entrepreneur's use of networks to business survival or performance and, similarly, Cooper et al. (1994) were unable to find a significant relationship between the use of professional advisors and firm survival. Further, Zhao and Aram (1995) argued that there is a cost to networking (in terms of the owner's time and possibly also financial) and, therefore, entrepreneurs need to be strategic in their use of networks by balancing the potential benefits of networking against the costs. The objective of this study, therefore, is to further investigate, in established businesses, the association between the networking activities of owners and SME performance.

This study makes a number of important contributions to the literature concerned with understanding the potential impact of networking on SME performance. First, this study examines established businesses. Brüderl and Preisendörfer (1998) argued that, although most of the work on networks to date has focused on new venture creation, owners face many similar issues after founding. Therefore, owners of established firms that are able to refer to a broad range of personal networks should also be more successful. Second, this is an empirical study of a large, longitudinal and representative database that allows important potentially confounding variables to be included in the analysis. Brüderl and Preisendörfer (1998) noted that many previous studies examining networks and entrepreneurship have been qualitative in nature, based on small samples, and have ignored important variables that should be

controlled. Third, and related to the previous point, the data allows a comprehensive analysis of the association between numerous networks (both formal and informal) and firm performance. The majority of past research has focused on a single network or, at best, a limited number of networks; making it difficult to reach sound conclusions regarding the association between network access and firm performance. Finally, because of the longitudinal nature of the data available, this study overcomes some of the perceived difficulties with relying purely on cross-sectional data. Using cross-sectional data only, makes it difficult to properly examine cause and effect issues, particularly in relation to topics such as the impact of *networking* on firm performance (Low and MacMillan 1988; Reese and Aldrich 1995), because there will always be a time delay between a stimulus (*networking* activity) and the resulting anticipated benefits (Havnes and Senneseth 2001). Low and MacMillan (1988) noted that it is important to recognize that only through such large scale cross sectional and longitudinal studies can we start to gain sufficient confidence about causality to construct theoretical models which can be subjected to experimental research.

Consistent with most of the prior empirical literature on networking, this study focuses on the personal networks of the SME owner, rather than on the organizational networks of the business (Brüderl and Preisendörfer 1998). It is hoped that the findings presented and discussed in this paper will help build a better theory of firm performance as well as inform owners, advisors, and policy makers. The remainder of this paper comprises: a brief summary of the literature concerned with networking and firm performance (incorporating the development of a number of testable hypotheses); a discussion of the methodology adopted (covering the data, performance measures and method of analysis used); the results and implications of the analysis; and, finally, a summary of the key findings and conclusions.

### LITERATURE REVIEW

Given the significant financial and human costs that inevitably follow a business failure, researchers have long been interested in the factors associated with firm performance (see, for example, Duchesneau and Gartner 1990; Cooper 1993; Cooper et al. 1994; Robson and Bennett 2000; Shepherd et al. 2000; Larsson et al. 2003). However, previous research on firm survival has tended to overlook the ways in which firms are relationally embedded within social networks (Amburgey and Rao 1996). By examining the SME owner's use of networks, this study places the SME owner within a social context. While there are many factors that can influence the success of a venture and there are various risk reduction strategies that can be employed to increase a firm's chances of survival (Shepherd et al. 2000), only recently have researchers begun to highlight the potential significance of an owner-manager's networking involvement (Cromie and Birley 1992). Coleman (1988) noted that information is important to decision making but is costly to obtain and that networks provide a means by which important information can potentially be acquired in a cost effective manner. Further, Granovetter (1983) argued that individuals whose networks (and, therefore, main source of information) comprise primarily family and friends (strong ties) are likely to have access to less information than individuals whose networks include many acquaintances (weak ties). Similarly, innovation theory suggests that networks (particularly those comprised of many weak ties) are important in diffusing innovations and, therefore, SMEs whose owners are heavily involved in networking should outperform SMEs whose owners make limited (or no) use of networks (Havnes and Senneseth 2001).

In support of the foregoing propositions there have been a limited number of empirical studies that have documented a positive association between networking and various aspects of firm performance. For example, Duchesneau and Gartner (1990) found that successful firms were more likely to have used professional advice. Potts (1977) noted that successful companies relied more heavily on accountants' information and advice than did unsuccessful companies. Kent (1994) found that the financial performance of a group of small pharmacy businesses was positively related to using external management advisory services. Donckels and Lambrecht (1995) found that network development, particularly at the national and international level, was positively associated with firm growth. Lerner, Brush and Hisrich (1997) found that network affiliation was significantly related to profitability, and that the use of outside advisors was related to revenue. Larsson et al. (2003) found that a lack of contacts with outside expert advisors was an obstacle to the expansion of small businesses. Hustedde and Pulver (1992) found that entrepreneurs who failed to seek assistance were less successful in acquiring equity capital and, similarly, Carter et al. (2003) reported that the more varied the group of business advisors a women business owner consulted, especially professional advisors, the more likely she was to succeed in securing equity financing.

Given the arguments advanced in favor of networking, and the balance of available evidence, it would seem reasonable to expect that firms that survive and prosper are likely to be more involved in

networking than those that fail or are less prosperous. However, the relationship between firm performance and networking (should it exist) is unlikely to be linear. While it is reasonable to expect that some level of networking will be beneficial, it is also plausible to suggest, consistent with the law of diminishing returns, that excessive networking is likely to be counter-productive. Economists have long argued that time is the scarcest economic resource and how individuals allocate their time can have profound economic effects (Uzzi 1997). Therefore, it is improbable that a SME owner could spend excessive amounts of time networking and still have the time necessary to run a sustainable business. Beyond some limit, it is likely that the marginal benefit from further networking will be more than offset by the negative impact of the owner's lack of available time to attend to important internal business affairs. If this is true, we should observe an inverted U shaped relationship between firm performance and the level of networking undertaken by SME owners. This gives rise to the first hypothesis to be tested in this study.

Hypothesis 1. The relationship between SME performance and *networking* will resemble an inverted U shaped function.

Littunen (2000) suggested that entrepreneurial networks could be categorized as either *formal* (for example: *external accountants*) or *informal* (for example: *family and friends*). Further, Zhao and Aram (1995) suggested that *networking* could be understood in terms of *range* (the number of different networks owners are involved with) and *intensity* (the frequency with which owners access those networks). If support is found for hypothesis 1, it will give rise to some further interesting issues that the prior literature has not really addressed. For example, are *formal* networks (which typically cost more to access but generally comprise weaker ties) of greater benefit than *informal* networks (which typically cost less to access but generally comprise stronger ties)? Also, should SME owners attempt to have a very broad support network that they access on a limited basis, or should SME owners have fewer supports that they access on a more regular basis; that is, is network *range* more important to firm performance than network *intensity*?

Given Granovetter's (1983) argument that weak ties are likely to result in the transfer of more new information than strong ties, and assuming that *formal* networks will result in more weak ties than *informal* networks, gives rise to the second hypothesis to be tested.

Hypothesis 2. *Formal* networks are likely to be more important to firm performance than *informal* networks.

The relative benefits of accessing a broad *range* of networks (infrequently) compared to accessing a narrower set of networks (with more *intensity*) is not as clear and might well depend on the key objectives of the SME owner. For example, if the primary objective is to grow rapidly the SME owner might be best advised to develop and pursue a broad *range* of networks because this is likely to result in more weak ties (and, therefore, more new information) than having a narrow range of networks. This gives rise to the third hypothesis to be tested.

Hypothesis 3. In terms of firm *survival*, network *intensity* will be more important than network *range*.

If, however, a SME owner has only recently started in business, and *survival* is of utmost importance, the owner might require more intense help from a reduced set of networks, particularly from *formal* network sources such as *external accountants* and *lawyers*. This gives rise to the final hypothesis to be tested.

Hypothesis 4. In terms of firm *growth*, network *range* will be more important than network *intensity*.

The following section describes: the data used in this study; how performance is measured; and the method of analysis adopted to test the above hypotheses.

## METHODOLOGY

### Data

A major difficulty in studying the performance of unlisted firms (which comprise the bulk of SMEs) is the lack of a reliable data source (Bannock and Doran 1980). In an attempt to remedy the shortage of

reliable data available for Australian SMEs, the federal government funded a major longitudinal study to provide information on the growth and performance of employing businesses. The Australian Bureau of Statistics' (ABS) Business Register was used as the population frame for the surveys. All employing businesses in the Australian economy were included in the scope of the survey except for businesses in the nature of: government enterprises; libraries; museums; parks and gardens; private households employing staff; agriculture, forestry and fishing; electricity, gas and water supply; communication services; government administration and defense; education; and health and community services. Data collection was through self-administered questionnaires distributed by the ABS for the periods 1994-95, 1995-96, 1996-97, and 1997-98.<sup>i</sup> Because the ABS can legally enforce compliance with its data requests (under the *Census and Statistics Act 1905*) response rates were very high (typically in excess of 90%).<sup>ii</sup> For confidentiality reasons, information on all large businesses (those employing more than 200 people) was excluded from the data set made available to researchers outside the ABS. Further, the ABS employed a stratified random sampling framework in which larger businesses and certain types of businesses (particularly manufacturing concerns) were over-represented. In all other respects, such as geographical location, the sample was representative of the population of Australian SMEs at the time of the surveys.<sup>iii</sup>

The ABS data from the 1995-96 (second) survey contained information relating to the frequency (never – coded '0'; between one and three times – coded '1'; or more than three times coded '2') with which owners had sought advice during the year from seven *formal* sources (*banks; business consultants; external accountants; industry associations; the Small Business Development Corporation (SBDC); solicitors/lawyers; and the tax office*) and three *informal* sources (*family and friends; local businesses; and others in the industry*). The question did not ask respondents how often they accessed each listed source for other *networking* purposes and, therefore, the data provided might not be representative of the full extent of *networking* by Australian SME owners. This is acknowledged as a limitation of the study. However, as seeking advice (and information) is one of the major purposes of *networking* (Hoang and Antoncic 2003), the data should provide a reasonable indication of the *range* and *intensity* of Australian SME owner's level of *networking* (*formal* and *informal*) allowing the hypothesized relationships between *networking* and firm performance to be appropriately tested. As this question was not repeated in the surveys for the following two years, it is assumed that the owners did not change their behavior patterns significantly over those subsequent periods. This is acknowledged as a further potential limitation of the study. Alternatively, it could be argued that there will always be a time delay between a stimulus (*networking* activity) and the resulting anticipated benefits (Havnes and Senneseth 2001) and, therefore, it is appropriate to look at performance in subsequent periods (irrespective of any changes in *networking* patterns that might take place during those subsequent periods). Given that the question relating to *networking* was asked in the second of the four surveys, the analysis in this study will be confined to the data provided by the second, third and final survey. The ABS data also included information on each firm's total income (comprising sales plus other income); profit; owners' equity; number of employees; age; and industry.

There were 5,027 responses to the 1995-96 (second) survey. However, on examining the data, it was found that 13 businesses had no income (sales or other income). Therefore, these businesses were excluded from the analysis on the assumption that they were not active businesses.<sup>iv</sup> This left 5,014 firms (representing approximately 1.25% of eligible Australian SMEs) that could be examined over the three-year period 1995-96 to 1997-98.

### Measuring Performance

In analyzing the potential determinants of successful firm performance it is imperative that we begin with a clear definition of what success means (Porter 1991). Because there are no (or limited) reporting requirements (other than for tax purposes) for the majority of firms (those not listed on a stock exchange) it is difficult, if not impossible, to obtain sufficient reliable information to measure their performance directly. Therefore, researchers have often been forced to rely on some recorded event as a surrogate (indirect) measure of firm performance. The two events for which data has been most readily available, are official bankruptcy proceedings being commenced against the firm and the discontinuance of the firm (Watson and Everett 1993). Typically, firms that have not been placed into bankruptcy, or have not discontinued operations, have been (by default) treated as successful. However, bankruptcy is a particularly narrow definition of failure and might exclude many businesses that would commonly be regarded as having failed. For example, businesses that are barely breaking even, providing neither a reasonable income for the owner, nor a fair return to the investor (Land 1975) would not be included in this definition of failure and, therefore, would be treated as successful. Fredland and Morris (1976) argued that business discontinuance (a much wider definition of failure

than bankruptcy) could be used as a proxy for failure, because discontinuance suggests that resources have been shifted to more profitable opportunities. Brüderl and Preisendörfer (1998) also argued that *survival* could be seen as the minimum criterion for success. Therefore, this study uses *survival* as its first measure of firm performance.<sup>v</sup>

Where researchers have attempted to obtain direct (rather than indirect) measures of firm performance, they have typically sought this information from the owner(s) of existing firms. Given the sensitivity surrounding profit numbers, and concerned about response rates, researchers have often limited their requests for data to firm *growth* (in sales and/or employees). Therefore, profit has seldom been used in research concerned with the performance of unlisted firms, not because researchers believe that profit is unimportant but because of concerns over response rates. However, having said that, *growth* is also important for business *survival* (Jovanovic 1982) and is particularly important to policy makers because of the widespread belief that growing businesses will create new jobs. There also seems to be an emerging consensus that if only one indicator of firm *growth* is to be selected it should be sales *growth* (Delmar et al. 2003). Therefore, this study uses *growth* in total income (sales plus other income) as a second measure of firm performance.

The third performance measure used in this study is *ROE* (return on equity) because this is typically the starting point for any systematic analysis of firm performance (Palepu et al. 2000). Indeed, a major strength of this study is the availability of data (annual profit and shareholders' equity) enabling firm performance to be assessed in the economic terms normally applied by stock market analysts (and others) when assessing the performances of large (listed) companies. Note that, as discussed in more detail later, this study assumes that *growth* and *ROE* performance measures are only relevant for firms that *survive*.

### Method of Analysis

The variables of interest in this study comprise: the SME owner's level of *networking*; the use of both *formal* and *informal* networks; network *range* and *intensity*; firm *survival*, *growth* and *ROE* (profitability); and a number of firm demographics (*age*, *industry* and *size*). In terms of *networking*, a SME owner could score between '0' (never accessed any *networks*) and '20' (accessed all ten *networks* on more than three occasions during the year). In terms of accessing *formal* networks, a SME owner could score between '0' (never accessed any of the *formal* sources) and '14' (accessed all seven *formal* network sources on more than three occasions during the year). Similarly, for *informal* networks, a SME owner could score between '0' (never accessed any of the *informal* sources) and '6' (accessed all three *informal* network sources on more than three occasions during the year). Network *range* could take any value between '0' and '10' (the total potential number of networks, *formal* and *informal*, that any individual SME owner could have indicated they had accessed during the year 1995-96). Network *intensity* provides an indication of the average *intensity* with which owners access networks. In calculating an owner's network *intensity* score, only those networks accessed by the owner are included. For example, if only one network was accessed, a score of either '1' or '2' would be recorded (depending on whether the SME owner accessed this network between one and three times or more than three times during the year). If more than one network was accessed, the score recorded would be the average score for the networks accessed. That is, if one network was accessed on between one and three occasions (scoring a '1') and another network was accessed on more than three occasions (scoring a '2') a network *intensity* score of '1.5' would be recorded. Therefore, where the SME owner is involved in accessing more than one network, the network *intensity* score provides an indication of how often, on average, those networks are accessed. For SME owners involved in some level of *networking*, the value for this variable would lie between '1' and '2'. If no networks were accessed, a score of '0' would be recorded for this variable.

Firms that *survived* to the last period were coded '1' and those that ceased to operate prior to the last period were coded '0'. Note that where a business was sold, and providing it continued to operate, it remained in the sample. Firm *growth* was measured as the percentage increase in total income (sales plus other income) across the last two years.<sup>vi</sup> *ROE* was measured by summing the annual profit for the last two years, dividing by the total equity at the end of the 1995-96 year and then multiplying by 100 to report it as a percentage.<sup>vii</sup> As noted earlier, one of the strengths of this study is its longitudinal nature which allows a firm's lagged performance to be assessed. It could be argued that the benefits of *networking* might take some time (years) to show up in terms of increased sales and/or profitability and, therefore, a purely cross-sectional analysis will not detect these benefits.

Given that firm *survival* is a dichotomous variable, binary logistic regression is used to analyze the relationship between *networking* and firm *survival*. Both multiple regression analysis and discriminant analysis were also considered for developing models to predict firm performance. However, these techniques pose difficulties when the dependent variable can have only two values (SPSS 1990). In this circumstance it is unreasonable to assume that the distribution of errors is normal, as required for regression analysis. Also, in multiple regression the predicted values cannot be interpreted as probabilities because they are not constrained to fall between 0 and 1. In addition, logistic regression requires fewer assumptions than discriminant analysis (SPSS 1990).

To assess the relationship between *networking* and both firm *growth* and *ROE*, the analysis will focus on those firms that are in the upper and lower quartiles for those two performance measures. Firms in the upper quartile were coded '1' and those in the lower quartile were coded '0' and, again, binary logistic analysis is used to assess the relationship between *networking* and these two measures of firm performance. Although it is unusual to discard data, there is an important reason for taking this approach. If there is a relationship between *networking* and firm performance, it will most likely be evident at the extreme ends of the performance spectrum. That being the case, focusing on those firms in the tails of the performance distribution (rather than including all firms) is more likely to find such a relationship. It should be noted that the initial analysis of *growth* and *ROE*, with all firms included, failed to find any significant positive association between these two performance measures and *networking*. That is, in the correlation matrix, neither of these performance measures was significantly positively associated with *networking*.<sup>viii</sup>

Also (as stated earlier), it should be noted that the analysis for *growth* and *ROE* is restricted to only those firms that survived to the last year of the study. While it might be argued that this introduces a survivorship bias, there are two counter arguments. First, including the discontinued firms would also introduce a bias because some assumption would be required with respect to *growth* and *ROE* for the discontinued firms. For example, would it be appropriate to measure their *growth* up until the time of their discontinuance and include that in the analysis, or should their *growth* be recorded as zero, or should their *growth* be recorded as negative 100% (given they would have had some sales in the initial year but no sales after they ceased to operate)? Second, given that the relationship between firm *survival* and *networking* is examined first, the *growth* and *ROE* performance measures are really only of interest to continuing firms and, therefore, to include discontinuing firms in the analysis would mean that the results could not be generalized to surviving firms.

It is also worth noting that, in the remainder of this paper, the words 'associated with' are used in preference to language that would imply a causal relationship, because while the relationships described are definitely predictive they might not be causal in nature (Menard 1995).

## RESULTS AND IMPLICATIONS

Table 1 provides a summary of the *range* and *intensity* with which Australian SME owners accessed advice from a variety of sources (*formal* and *informal*) during the period 1995-96. Consistent with Cooper et al. (1989) and Robson and Bennett (2000), the owners in this study accessed information from a number of different sources (both *formal* and *informal*); with *external accountants*; *banks*; *others in the industry*; and *solicitors* being the networks most frequently accessed. For example, 45 percent of SME owners accessed an *external accountant* on more than three occasions during the 1995-96 year. This finding is consistent with Robson and Bennett (2000) who reported that, from the private sector, *external accountants* were the most widely accessed source of advice, followed by *banks* and *lawyers*. However, unlike Birley (1985) who found that entrepreneurs relied heavily on *informal* networks (but seldom tapped into *formal* networks), the results presented in Table 1 suggest that Australian SME owners make extensive use of both *formal* and *informal* networks.

Table 1: *Range and Intensity of Formal and Informal Network Access*

<i>Range of Networks Accessed</i>	<i>Intensity of Access</i>		
	Never	1-3 times	>3 times
<i>Formal Networks</i>			
- <i>Bank</i>	38%	35%	27%
- <i>Business Consultant</i>	72%	18%	10%
- <i>External Accountant</i>	20%	35%	45%
- <i>Industry Associations</i>	60%	21%	19%
- <i>SBDC</i>	84%	13%	3%
- <i>Solicitor/Lawyer</i>	43%	34%	23%
- <i>Tax Office</i>	59%	31%	10%
Average for <i>Formal Networks</i>	54%	27%	19%
<i>Informal Networks</i>			
- <i>Family &amp; Friends</i>	65%	19%	16%
- <i>Local Businesses</i>	74%	16%	10%
- <i>Others in the Industry</i>	45%	29%	25%
Average for <i>Informal Networks</i>	61%	22%	17%
Average for All Networks	56%	25%	19%

The demographics for *surviving/discontinuing*, high/low *growth*, and high/low *ROE* firms are provided in Table 2. The sample size is reduced for the *ROE* analysis as firms with either zero or negative equity are removed because *ROE* could not be meaningfully calculated for these firms. Table 2 indicates some significant demographic differences between the various groups. For example, the discontinued firms were: typically younger and smaller than the surviving firms; more likely to be involved with accommodation, cafes or restaurants; and less likely to be involved in wholesale trade. Also, a significantly higher proportion of firms from the oldest age category were likely to be in the lowest quartile for firm *growth* and *ROE*; while young firms were more likely to be in the high *growth* group.<sup>ix</sup> There also appears to be some significant differences between the various groups in terms of the network variables; indicating a positive relationship between *networking* and performance (particularly with respect to *survival* and to a lesser extent *growth*, but not *ROE*<sup>x</sup>). However, this result does not take into account demographic variables (*age*, *industry* and *size*) that could be confounding the results. That is, some of these variables could potentially be related to both firm performance and the owner's level of *networking* (Fischer and Reuber 2003). For example, owners of *young* firms might be less involved in *networking* and their firms might also be more likely to fail (Jovanovic 1982). Similarly, failure rates have been shown to vary by *industry* (Watson and Everett 1999) and *size* of business (Watson and Everett 1996), and these factors might also be related to an owner's propensity for *networking*.

Table 2: Demographics for Various Sub-Groups of Firms

	<i>Survived</i>			<i>Growth</i>		<i>ROE</i>			
	n=	Yes 4,266	No 748	High 1,066	Low 1,066	High 1,006	Low 1,006		
<i>Firm Age</i>	(%)	(%)		(%)	(%)	(%)	(%)		
- Less than 2 years old	5.8	55.7	**	9.4	4.8	**	8.3	7.2	
- 2 years to less than 5	16.6	10.2	**	20.9	18.3	**	19.7	18.0	
- 5 years to less than 10	27.3	15.4	**	28.2	28.2		28.6	27.9	
- 10 years to less than 20	28.2	10.4	**	25.8	27.5		28.9	27.1	
- 20 or more years old	22.0	8.3	**	15.7	21.2	**	14.4	19.8	**
Totals	100	100		100	100		100	100	
<i>Industry</i>	(%)	(%)		(%)	(%)		(%)	(%)	
- Mining	0.9	1.6		1.0	1.3		0.8	1.2	
- Manufacturing	36.7	35.6		33.8	38.2	**	32.2	36.6	**
- Construction	6.0	5.2		10.0	5.5	**	7.7	5.1	**
- Wholesale Trade	15.4	11.4	**	13.6	14.4		15.3	15.4	
- Retail Trade	10.3	11.6		8.2	8.4		10.9	11.3	
- Accom, Cafes, Restaurants	3.8	5.7	**	2.3	3.9	**	3.6	4.0	
- Transport & Storage	4.0	3.7		3.5	3.8		3.5	5.1	**
- Finance & Insurance	4.1	5.2		5.9	5.8		3.5	3.2	
- Property & Bus Services	14.3	14.3		17.2	14.2	*	17.4	13.2	**
- Cultural & Rec Services	2.3	2.7		2.3	2.4		1.6	3.0	**
- Personal & Other Services	2.2	2.9		2.2	1.9		3.6	2.0	**
Totals	100	100		100	100		100	100	
<i>Firm Size</i> (No. of employees)									
- Mean	27	24		24	24		25	25	
- Median	13	7	**	11	10		11	11	
<i>Networking Score</i>									
- Mean	6.61	4.25	**	6.72	6.31	*	6.40	6.79	
- Median	6.00	3.00	**	6.00	6.00	*	6.00	6.00	
<i>Formal Networks</i>									
- Mean	4.85	3.10	**	4.91	4.58	*	4.67	4.94	
- Median	5.00	2.00	**	5.00	4.00	*	4.00	5.00	
<i>Informal Networks</i>									
- Mean	1.76	1.15	**	1.81	1.73		1.72	1.84	
- Median	1.00	0.00	**	1.00	1.00		1.00	2.00	
<i>Networking Range</i>									
- Mean	4.62	3.07	**	4.72	4.41	**	4.48	4.71	
- Median	5.00	3.00	**	5.00	4.00	**	4.00	5.00	*
<i>Networking Intensity</i>									
- Mean	1.27	0.88	**	1.29	1.24	*	1.25	1.27	
- Median	1.33	1.00	**	1.33	1.29		1.33	1.33	

\*p&lt;0.05, \*\*p&lt;0.01

To allow the various demographic variables reported in Table 2 to be controlled, logistic regression is used to examine the relationship between *networking* (including the use of *formal* and *informal* networks and network *range* and *intensity*) and firm performance (*survival*, *growth* and *ROE*). Prior to conducting the logistic regression analysis, however, the data was examined using the curve estimation procedure in SPSS to see if there is any indication of a relationship between *networking* and firm *survival*, *growth* or *ROE* that is other than linear. Figure 1 depicts the results of estimating the relationship between firm *survival* and *networking* using both a linear and quadratic model. Note that the *networking* variable can vary from '0' to '20' and is the product of network *range* (which can vary from '0' to '10') and network *intensity* (which can vary from '0' to '2').

Figure 1: Probability of *Survival* Fitted Against Network *Range*

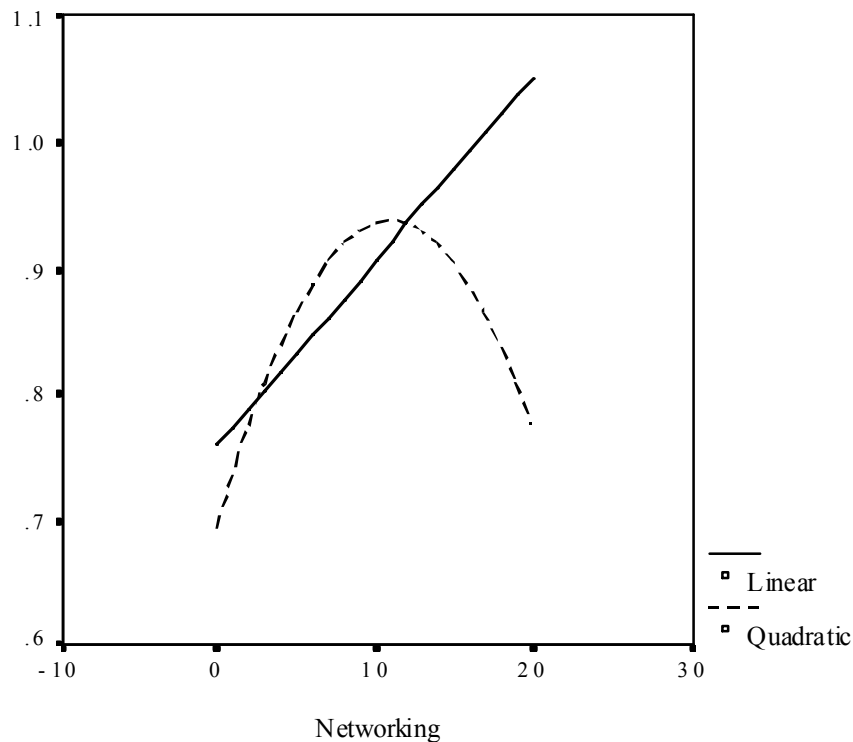


Figure 1 indicates that the relationship between firm *survival* and *networking* might indeed be best represented by an inverted U shaped function (as proposed in hypothesis 1). The same inverted U shaped relationship (not reported) also applied with respect to *networking* and *growth*, but not *ROE*. Similarly, the relationship between both *survival* and *growth* (but not *ROE*) and the use of *formal* and *informal* networks, and network *range* and *intensity* also resembled inverted U shaped functions. The curve estimation procedure, therefore, provides preliminary support for hypothesis 1 with respect to firm *survival* and *growth*, but not *ROE*. In terms of an optimum network *range*, the results indicated that the probability of both *survival* and high *growth* peaked when the SME owner was involved in about six networks, beyond this level the probability of *survival* and high *growth* declined. With respect to network *intensity*, the results indicated that the maximum benefit (in terms of *survival* and *growth*) was achieved with a score of about 1.5, again indicating that excessive *networking* might be counter-productive.<sup>xi</sup>

The findings reported so far indicate that the *survival* and *growth* of SMEs can be enhanced by owners being involved, up to a limit, in a *range* of networks and, thus, confirm the potential importance of social capital (Coleman 1988) to SME performance. However, in terms of *ROE* (profitability), it would seem there is little to be gained by owners of established firms being involved in *networking*. It would appear that the additional financial benefits potentially derived from *networking* do not outweigh the additional costs (both financial and in terms of the owners' time). This finding supports the argument by Zhao and Aram (1995) that SME owners need to be strategic in terms of their *networking* involvement; that is, they need to balance their desire to maximize their firm's *survival* and *growth* prospects against the return they expect to earn.

Given the above results, all *networking* variables are entered into the logistic regression analysis as first and second order variables. Table 3 provides the results of examining the relationship between firm performance (*survival*, *growth* and *ROE*) and the level of *networking* activity undertaken by SME owners. In the first model, only the demographic variables (*age*, *industry* and *size*) are included. In the second model, *networking* is added. As can be seen from the table, the first order *networking* variable is significantly positively related to the probability of firm *survival* and, to a lesser extent, *growth*, but not *ROE*. The results also indicate that the second order *networking* variable is significantly negatively associated with *survival* and *growth*, but not *ROE*. These results add further support to hypothesis 1 (the relationship between SME performance and *networking* will resemble an inverted U shaped function) for both *survival* and *growth*, but not *ROE*.

Table 3: Logistic Regression Models of *Survival*, *Growth* and *ROE* Against *Networking*

Variables	<i>Survival</i>				<i>Growth</i>				<i>ROE</i>									
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2							
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)						
<i>Firm Age</i>			**	**	**	**	**	**	*	*	*	*						
- Less than 2 years old	-3.21	0.04	**	-3.34	0.04	**	0.96	2.62	**	0.97	2.63	**	0.47	1.60	*	0.47	1.59	*
- 2 years to less than 5	-0.43	0.65	*	-0.44	0.64	*	0.41	1.50	*	0.40	1.50	*	0.40	1.49	*	0.39	1.47	*
- 5 years to less than 10	-0.35	0.70	*	-0.28	0.76		0.28	1.33	*	0.28	1.32	*	0.34	1.40	*	0.33	1.39	*
- 10 years to less than 20	0.05	1.05		0.10	1.10		0.22	1.24		0.23	1.26		0.37	1.45	**	0.36	1.43	*
<i>Industry</i>							*	*		**	**	**	**	**	**	**	**	**
- Mining	-0.24	0.79		-0.20	0.82		-0.47	0.63		-0.43	0.65		-1.02	0.36		-1.06	0.35	*
- Manufacturing	0.02	1.02		-0.04	0.96		-0.25	0.78		-0.28	0.76		-0.70	0.50	*	-0.70	0.50	*
- Construction	0.28	1.33		0.14	1.15		0.45	1.57		0.44	1.55		-0.15	0.86		-0.14	0.87	
- Wholesale Trade	0.45	1.56		0.38	1.46		-0.18	0.83		-0.21	0.81		-0.56	0.57		-0.55	0.58	
- Retail Trade	0.11	1.12		0.06	1.06		-0.22	0.81		-0.23	0.80		-0.63	0.53	*	-0.64	0.53	*
- Accom, Cafes, Rest's	-0.10	0.90		-0.11	0.90		-0.66	0.52		-0.66	0.52		-0.69	0.50	*	-0.71	0.49	*
- Transport & Storage	0.24	1.27		0.20	1.22		-0.24	0.78		-0.24	0.78		-0.95	0.39	**	-0.96	0.38	**
- Finance & Insurance	-0.17	0.85		-0.22	0.80		-0.10	0.90		-0.11	0.90		-0.51	0.60		-0.51	0.60	
- Property & Bus Serv	0.23	1.25		0.16	1.17		0.03	1.03		0.03	1.03		-0.32	0.73		-0.32	0.72	
- Cultural & Rec Serv	0.16	1.17		0.19	1.20		-0.19	0.82		-0.18	0.84		-1.20	0.30	**	-1.22	0.30	**
<i>Firm Size</i>	0.00	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00	1.00		0.00	1.00	
<i>Networking</i>				0.37	1.45	**				0.10	1.10	**				-0.02	0.98	
<i>Networking</i> <sup>2</sup>				-0.02	0.98	**				-0.01	1.00	*				0.00	1.00	
Nagelkerke R Square	0.327		0.392		0.032		0.039		0.024		0.027							

\*p&lt;0.05, \*\*p&lt;0.01

In Table 4, the overall *networking* variable is replaced, firstly, by the *formal* and *informal* network variables (model 3) and, secondly, by the network *range* and *intensity* variables (model 4). Consistent with hypothesis 2, the results in Table 4 indicate that a firm's *survival* and *growth* (but not *ROE*) is more strongly associated with an owner's involvement in *formal* rather than *informal* networks. This finding supports the argument that weak ties are likely to be more important in the dissemination of information than strong ties (Granovetter 1983).

When the individual *formal* and *informal* networks were included in the analysis (not reported) no *informal networks* appeared to be associated with either *survival* or *growth*, while two formal networks (*external accountants* and *industry associations*) were positively associated with *survival* and one formal network (*external accountants*) was positively associated with *growth*. For example, compared to owners who sought advice from an *external accountant* on more than three occasions during the year, those that did not seek advice from this source were 70% less likely to have *survived* in business. This finding indicates that *external accountants* play a central role in building bridges and diffusing information between the various parties in their social networks (Granovetter 1973). However, firms that sought advice from an *external accountant* on between one and three occasions during the year were no less likely to *survive* (or to achieve high *growth*) than those accessing this source more frequently. Similarly, accessing advice from *industry associations* on more than three occasions during the year was of no additional benefit (beyond accessing advice from this source on between one and three occasions during the year). These results support the notion that excessive *networking* might be counter-productive. It should also be noted that *business consultants* were negatively associated with firm *survival*; that is, firms that never accessed *business consultants* were more likely to *survive* compared to firms that accessed this network source on more than three occasions during the year. However, some caution needs to be exercised in interpreting this latter result because it is possible that firms already experiencing difficulties might turn to *business consultants* for advice in an attempt to overcome their problems (Robson and Bennett 2000).<sup>xii</sup>

Table 4: Logistic Regression Models of *Survival*, *Growth* and *ROE* Against *Formal* and *Informal* Networks and Network *Range* and *Intensity*

Variables	<i>Survival</i>				<i>Growth</i>				<i>ROE</i>											
	Model 3		Model 4		Model 3		Model 4		Model 3		Model 4									
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)								
<i>Firm Age</i>																				
- Less than 2 years old	-3.33	0.04	**		-3.33	0.04	**		0.98	2.67	**	0.97	2.64	**	0.46	1.59	*	0.47	1.60	*
- 2 years to less than 5	-0.43	0.65	*		-0.46	0.63	*		0.43	1.54	**	0.40	1.49	**	0.38	1.47	*	0.40	1.48	*
- 5 years to less than 10	-0.27	0.76			-0.26	0.77			0.30	1.35	*	0.27	1.31	*	0.33	1.39	*	0.33	1.39	*
- 10 years to less than 20	0.09	1.09			0.07	1.08			0.23	1.25		0.22	1.25		0.36	1.43	*	0.36	1.43	*
<i>Industry</i>																				
- Mining	-0.25	0.78			-0.22	0.81			-0.46	0.63		-0.42	0.66		-1.06	0.35	*	-1.06	0.35	*
- Manufacturing	-0.08	0.92			-0.03	0.97			-0.29	0.75		-0.29	0.75		-0.70	0.50	*	-0.69	0.50	*
- Construction	0.11	1.12			0.06	1.07			0.45	1.56		0.43	1.54		-0.15	0.86		-0.13	0.88	
- Wholesale Trade	0.33	1.39			0.40	1.50			-0.23	0.80		-0.23	0.80		-0.55	0.58		-0.56	0.57	
- Retail Trade	0.04	1.04			0.06	1.06			-0.22	0.81		-0.24	0.79		-0.64	0.53	*	-0.63	0.53	*
- Accom, Cafes, Rest's	-0.13	0.88			-0.18	0.83			-0.65	0.52		-0.68	0.51		-0.71	0.49		-0.71	0.49	
- Transport & Storage	0.18	1.20			0.20	1.22			-0.25	0.78		-0.25	0.78		-0.96	0.38	**	-0.97	0.38	**
- Finance & Insurance	-0.24	0.79			-0.25	0.78			-0.11	0.90		-0.11	0.90		-0.51	0.60		-0.52	0.60	
- Property & Bus Serv	0.11	1.11			0.10	1.10			0.02	1.02		0.02	1.02		-0.32	0.72		-0.33	0.72	
- Cultural & Rec Serv	0.19	1.21			0.23	1.26			-0.15	0.86		-0.17	0.84		-1.22	0.29	**	-1.23	0.29	**
<i>Firm Size</i>	0.00	1.00			0.00	1.00			0.00	1.00		0.00	1.00		0.00	1.00		0.00	1.00	
<i>Formal Networks</i>	0.46	1.59	**						0.13	1.14	**				-0.03	0.98				
<i>Formal Networks</i> <sup>2</sup>	-0.03	0.97	**						-0.01	0.99	*				0.00	1.00				
<i>Informal Networks</i>	0.19	1.20	*						-0.07	0.94					0.01	1.01				
<i>Informal Networks</i> <sup>2</sup>	-0.02	0.98							0.01	1.01					-0.01	1.00				
<i>Network Range</i>				0.04	1.04							0.23	1.26	**				-0.06	0.95	
<i>Network Range</i> <sup>2</sup>				0.00	1.00							-0.02	0.98	*				0.00	1.00	
<i>Network Intensity</i>				2.19	8.92	**						-0.25	0.78					-0.07	0.93	
<i>Network Intensity</i> <sup>2</sup>				-0.65	0.52	**						0.09	1.09					0.06	1.06	
Nagelkerke R Square	0.392		0.406		0.041		0.041		0.027		0.027									

\*p<0.05, \*\*p<0.01

The results for model 4 (in Table 4) support hypothesis 3 (in terms of firm *survival*, network *intensity* will be more important than network *range*) and hypothesis 4 (in terms of firm *growth*, network *range* will be more important than network *intensity*). This finding indicates that SME owners need to be strategic in terms of the nature of their *networking* involvement. If *growth* is of paramount concern, SME owners would be well advised to consider developing a broad *range* of networks, although the significance of the second order network *range* variable suggests there is a limit beyond which further *networking* involvement is likely to be counter-productive. Alternatively, if *survival* is of paramount concern (as might be the case early in the life of a new venture), SME owners would be well advised to develop closer ties with a smaller *range* of networks (in particular with an *external accountant*). Again, however, SME owners should carefully monitor the time and cost associated with *networking* because the results indicate that very high levels of network *intensity* can be counter-productive.

### SUMMARY AND CONCLUSIONS

The ability to identify key factors associated with the performance of SMEs is of significant interest to public policy makers and would-be entrepreneurs. Although many studies have investigated the determinants of SME success in a variety of countries, accurate models for predicting venture performance are not widely available (Lussier and Pfeifer 2001). The purpose of this study, therefore, was to examine (and model) the potential impact of *networking* on firm performance (*survival*, *growth* and *ROE*).

The findings indicate that (after allowing for *age*, *industry* and *size* of business) *networking* appears to be significantly positively associated with firm *survival* and, to a lesser extent, *growth* (consistent with the results of Brüderl and Preisendörfer 1998 for newly established firms). This finding confirms the importance of social capital (Coleman 1988) in providing SME owners with information critical to the success of their ventures. However, there appears to be no significant positive association between *networking* and *ROE* (profitability). Further, the findings with respect to *survival* and *growth* suggest there might be some optimum level of resources that an owner should devote to *networking*. For example, accessing more than six networks during a year is likely to be counter-productive. Similarly, accessing any individual network on more than three occasions during a year is also likely to be counter-productive. Therefore, given that business failure generally results in heavy personal loss

(Bannock 1981), owners need to seriously consider the *range* and *intensity* with which they access various potential networks (*formal* and *informal*).

The results also indicate that both *formal* and *informal* networks are associated with firm *survival*, but that only *formal* networks are associated with *growth* (and neither *formal* nor *informal* networks are associated with *ROE*). The finding with respect to *formal* networks highlights the particular importance of weak ties (Granovetter 1983) in building a SME owner's social capital. In terms of individual networks, accessing advice from *external accountants* was the only network source positively associated with both firm *survival* and *growth*. This finding indicates that *external accountants* are likely to be important in forming bridges (Granovetter 1973) between different actors (clients) to their mutual benefit. These results support the earlier findings of Duchesneau and Gartner (1990) and Potts (1977), and the assertion by Cooper et al. (1988) that business owners would be well advised to form relationships with outsiders, such as professional advisors, because they can be objective and detached in diagnosing problems and assessing a firm's prospects.

Finally, the results show that network *intensity* is more critical to firm *survival* than network *range*. Conversely, network *range* is more critical to firm *growth* than network *intensity*, again confirming the importance of weak ties (Granovetter 1983) in disseminating information and providing support for the assertion by Fischer and Reuber (2003) that owners of rapid-growth firms should be interested in (and should support) government policy aimed at developing a network-based approach to facilitating firm *growth*.

In conclusion, while the results of this study provide some support for *networking* activities (particularly in terms of firm *survival* and *growth*), they cannot be seen as providing support for Davidsson and Honig's (2003, p.303) suggestion that owners 'would be well advised to develop and promote networks of all sorts.' Indeed, the widespread involvement of owners in multiple networks is likely to be counter-productive. From a government policy perspective, the results suggest that encouraging *networking* might well be highly beneficial if the objective is to maximize business *survival* and *growth*, however, encouraging *networking* is unlikely to benefit firm profitability (*ROE*). It is hoped that the results presented in this study will inform researchers, practitioners, policy makers and business owners about the potential benefits, and costs, of *networking*.

## NOTES

- i Copies of the questionnaires can be obtained from the ABS.
- ii A non-response normally meant the ABS was unable to locate the business proprietor (or the business) and this was, therefore, treated as a business closure (failure).
- iii To maintain a representative sample, businesses that ceased operations were replaced with similar businesses.
- iv Including these firms did not significantly alter the results.
- v It should be noted, however, that discontinuance does not necessarily imply failure (Watson and Everett 1993).
- vi  $Growth = ((Total\ income\ 97-98 / Total\ Income\ 95-96) - 1) * 100$
- vii  $ROE = ((Profit\ 1996-97\ plus\ Profit\ 1997-98) / Equity\ 1995-96) * 100$
- viii This finding is consistent with the results reported by Havnes and Senneseth (2001) with respect to firm growth.
- ix It should be noted that firm age is reported as a categorical variable because that is the way the data was provided by the ABS.
- x The results indicate that the owners of firms in the low ROE group accessed a broader range of networks than the owners of firms in the high ROE group.
- xi Note that a network intensity score of '1' means that network contact is made between one and three times a year; and a network intensity score of '2' means that network contact is made on more than three occasions during the year.
- xii However, comparing the mean (and median) profit in the previous year (1994-95) for these two groups (those that never accessed business consultants and those that accessed business consultants on more than three occasions) did not support this explanation as firms that had regularly sought

advice from business consultants did not have significantly lower profits (on average) in the previous year.

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