

Socially embedded relationships of firms: An aid to recovery in a vulnerable community?

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Abstract

In the event of a significant natural disaster, the relocation of businesses would be a major threat to community recovery. The likely location behaviour of privately owned businesses in a post-disaster situation is explored as part of an investigation into the spatial behaviour of businesses in the Wellington region. Businesses were surveyed in three industry sectors: creative manufacturing, earthquake engineering and information and communications technology. The study found that surveyed firms have access to a range of weak and strong ties. The proportion of social ties in owners' close networks is unusually high. There is evidence to suggest that surveyed businesses are heavily embedded in the Wellington region, making them vulnerable to disruption if a disaster event occurred. It appears that these businesses place a high value on both economic and personal amenity criteria when selecting a location under normal circumstances. In the event of a disaster though, trading relationships would have a significant influence on the choice of location, and the relocation of major trading partners would compel some business owners to consider leaving the region as they would wish to maintain spatial proximity to important clients and customers should these leave the region. Whilst the socially embedded relationships of firms are significant to emerging businesses and are part of a range of criteria that influence normal location behaviour, they are less relevant to location decisions than business relationships if a disaster was to occur. The networking relationships of business owners therefore have important implications for community recovery.

Keywords: **Natural disasters • Economic impacts • Networking •
Spatial proximity • Location decisions**

Introduction

Studies of disaster-hit communities in the United States have indicated that firms remaining in business are essential to community recovery, providing employment and income for residents, and in some instances becoming actively involved in the strategic planning of the rebuilt community (Connor, 2005; Lubell, 2006). In order to continue operating after a disaster, the markets for a firm's goods and services need to remain intact and its trading relationships with suppliers and customers in place. Using empirical evidence collected in the Wellington region, this study investigates in what ways the different types of relationships of business owners – as agents of the firm – affect their

location decisions after a natural disaster. More specifically, are the socially embedded relationships of owners able to encourage them to stay on in a community hit by a significant natural disaster and therefore act as an aid to community recovery?

The paper is in five main parts. Firstly it examines the links between natural disasters and economic recovery, looking at the evidence collected from natural disasters that have occurred in the past. In section two, there is a discussion of some of the debates surrounding spatial proximity, social networking and location decisions that forms the theoretical context for this study. This is followed in section three by an outline of research questions investigated in this paper and the methodology used to collect the data. Section four presents the results of the empirical analysis. The paper concludes with a discussion of the findings and argues that the trading relationships of businesses and the markets in which they operate are important influences on a firm's location behaviour after a devastating natural disaster. If organisations leave the region, inducing others to follow them, there would be significant repercussions for the community's overall recovery. The socially embedded relationships of businesses will only assist recovery if firms remain in a disaster-hit area.

Natural disasters and economic recovery

In recent years significant natural disasters have resulted in substantial economic and human losses, for example the 2004 Boxing Day tsunami, resulting in more than 225,000 deaths, hurricanes Katrina and Rita, causing US\$131 billion of economic damage in 2005, and also in 2005 the Kashmir earthquake, resulting in approximately 75,000 mortalities (EM-DAT, 2007; UN/ISDR, 2006). Also as of late, there has been an increase in research activity into the economic impacts of natural disasters, an area of study that until recently had received little attention from researchers (Pelling *et al.*, 2002). Rather than estimating the economic impacts of the disaster through the calculation of the cost of physical assets lost or damaged, these studies have sought to understand the macro-economic effects of disasters and to recognise the conditions that may improve the resilience of economies or assist in their recovery after a natural disaster.

Research studies that investigate whether natural disasters have a positive or negative impact on economic growth are however inconclusive. On the one hand there are claims that natural disasters can sometimes stimulate the economy of the region affected by disaster through the injection of insurance payouts into the economy and/or the acceleration of economic changes already underway, for example Horwich (2000) or Skidmore and Toya (2002). Other commentators suggest that disasters may have an overall negative effect on the economy, for example Guimares *et al.* (1993). Still more suggest that certain factors are likely to affect the impact of a disaster on the economy. These include, but are not confined to, the following:

- the strength of the local economy prior to the disaster (Ewing *et al.*, 2004; Passerini, 2000);
- the economic and racial demography of the area (Baade *et al.* 2005);
- the availability of technological fixes that can minimise future damage of an event even if the risk of one occurring cannot be reduced (Baade *et al.*, 2005; Burby *et al.*, 2000; Horwich, 2000);
- the size of the economy and whether the nation is a developing or developed country (Noy, 2007); and
- the relative proximity of labour markets to the area hit by the disaster (Belasen and Polachek, 2007).

Alongside the research on the macro-economic impacts of natural disasters sits another body of research that examines the relationship between individual businesses and natural

disasters. This too was fairly undeveloped until recently when compared to other units of analysis such as families, local communities and public sector organisations (Webb *et al.*, 2000). Many of the empirical studies of business recovery are based on the outcomes of U.S. natural disasters, such as the earthquakes in Nisqually in the state of Washington (2001) and Loma Prieta, California (1989).

It is commonly assumed that there is large-scale business failure after a disaster (Tynan, 2003), but surveys conducted by the Disaster Recovery Center at the University of Delaware indicate that most businesses recover to pre-disaster levels of financial well-being in the short- and long-term (Webb *et al.*, 2000). However Alesch (2005) observed in his longitudinal studies of natural disasters that very few companies fail in the short term, and some will struggle for several years to restore their business before they eventually close down. The effects of a disaster on a community can take years to unfold (Alesch *et al.*, 2001; Alesch, 2005; Miles and Chang, 2006).

Studies into post-disaster business recovery indicate that the characteristics of a business may make it vulnerable to loss or likely to suffer from difficulties recovering. A range of studies have found that the size of business is an important predictor of recovery with small businesses exhibiting a greater tendency for suffering significant loss (Alesch *et al.*, 2001; Chang, 2001; Chang and Falit-Baiamonte, 2002; Dahlhamer, 1998; Dahlhamer and Tierney, 1998; Kroll *et al.*, 1991). The industry in which a business operates also appears to influence vulnerability with several studies indicating that businesses in the retail sector are particularly exposed to the ill effects of natural disasters (Meszaros and Fiegenger, 2002; Webb *et al.*, 2000). Whilst natural disasters can be ruinous for some firms, they can prove to be a stimulus for others, for example the construction sector experienced increased levels of business in the immediate aftermath of the Loma Prieta, Nisqually and Northridge earthquakes and Hurricane Andrew (Dahlhamer, 1998; Kroll *et al.*, 1991; Meszaros and Fiegenger, 2002; Tobin, 1999). Financial strength before a disaster was found to be another variable which helps to determine organisational survival (Alesch *et al.*, 2001; Meszaros and Fiegenger, 2002; Webb *et al.*, 2000). Businesses that are more robust financially seem to have a better chance of surviving a disaster, whilst those that are in a weaker position are more likely to be worse off.

Business recovery is also dependent upon the competitive nature of the market in which the businesses are operating. The more competitive or unstable the market, the more likely it is that customers will move their allegiance to competitors unaffected by the disaster (Chang, 2001; Chang and Falit-Baiamonte, 2002; Kroll *et al.*, 1991). Alesch *et al.* (2001) observed in their study of a cross-section of natural disasters that in a highly competitive market, the longer businesses are closed the less likely it is that customers will return. As an example in the communities around New Orleans, some businesses that opened quickly after the Hurricane Katrina experienced revenue growth, especially those associated with home improvements, building repairs, restaurants and other food services (Runyan, 2006).

One can also draw some conclusions about the vulnerability of firms by looking at the markets in which the firms are operating. Businesses that rely heavily on a local market face the likelihood that their customers will also have been affected by the disaster, whilst those companies whose market is dispersed geographically face a reduced risk of this happening (Alesch *et al.*, 2001; Webb *et al.*, 2002). In their study of the effects of the Loma Prieta earthquake, Kroll *et al.* (1991) found that businesses that had multiple locations in the region, for example banks, could relocate their activities quickly. However businesses that had a single location, for example retail businesses and some finance, insurance, real estate and service businesses, were more vulnerable. Tobin (1999) reported that whilst many businesses were completely destroyed after Hurricane Andrew,

some national franchises were serving customers even before the debris was cleared away.

Even if a business escapes physical damage, the relationship between customers and suppliers seems to be particularly important as an aid to return to normality, with businesses vulnerable if customers cannot or prefer not to travel to them, or if the supply chain is either temporarily or permanently disrupted (Meszaros *et al.*, 2005). Some businesses may choose to relocate to avoid the costs of rebuilding or the risk of a further disaster, but in doing so they incur the costs of relocating and risk disrupting relationships with existing customers and suppliers.

Whilst the studies referred to above seek to explain the macro-economic impact of past disasters and the factors that made businesses vulnerable, the present study seeks to anticipate the location behaviour of firms and the factors that would influence it after a possible future disaster. To aid understanding of a firm's location behaviour and its influences, the next section of this paper discusses some of the theoretical debates around spatial proximity, the relationships between businesses, and location behaviour.

Theoretical context

In a world where seemingly distance is becoming less important and the costs of transportation and communication are being reduced (Cairncross, 1997; McCann, 2003), the geography of business locations is possibly less significant than in the past. With its extreme peripherality and remoteness from major consumer markets, this notion is of particular significance to New Zealand. Yet in spite of the improvements to communications and the increased mobility of capital and labour, it is observed that certain places remain 'sticky', attracting and keeping capital and labour in what can be described as increasingly 'slippery' space (Markusen, 1996). So whilst some theorists suggest that the processes of globalization and digitalization signal the 'death of geography', others, especially those interested in innovation processes, claim that geography is an important influence on learning, innovation and development (Morgan, 2004). Indeed in certain places, such as Silicon Valley, proximity and the ability to maintain face-to-face contact is so essential that entrepreneurs find it difficult to even raise the capital to start a business unless they are located a short distance from potential investors (Stross, 2006).

In recent years there has been a surge of interest in the geographical aspects of development, or in other words the location of economic development (Krugman, 1998). This interest arose in part from the observation of spatial industrial clustering and regional specialisation in the electronics industry in Silicon Valley (e.g. Saxenian, 1994) and the clothing industry in northern Italy (e.g. Piore and Sabel, 1984). A variety of literatures claim that firm proximity confers important advantages in terms of costs, productivity, flexibility, learning and innovation (Feser and Sweeney, 2002). The literature around the geographic concentration of specific industries can be traced back to the end of the 19th century and the theorist Alfred Marshall, who identified three types of externalities encountered by firms in close proximity: knowledge spill-overs, labour-pooling economies and supplier specialisation (1920).

More recently Michael Porter is largely credited for popularising the concept of 'clusters' to explain why firms in certain industries based in particular countries were able to compete successfully through exporting or foreign investment. He defined clusters as 'a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities' (Porter, 1998, p.199). The geographic scope of the cluster, Porter proposed, can range from a city or region to a country or even neighbouring countries. The lack of clear geographical and industrial

boundaries in Porter's definition are cited as the main problems in defining clusters; the vagueness resulting in different analysts being able to use the idea of clusters to suit their own purposes (Martin and Sunley, 2003). It is unlikely that a firm would not have horizontal or vertical links with other organisations within a defined geographic area, and this being the case, is every firm part of a cluster and therefore is the concept meaningless? Indeed, it is suggested that in most states in the USA, sufficient clusters are identified so that almost every employer is included in one (Rosenfeld, 2001). Suggesting that Porter's notion of clusters is overly simplistic, more rigorous researchers claim that the both the causes and effects of spatial clustering remain elusive (Malmberg and Maskell, 2001).

Yet in spite of academic criticisms of Porter's concept (Benneworth *et al.*, 2003; Martin and Sunley, 2003), his ideas have been well-received by policy-makers across the globe. The support of clusters has been part of many economic development strategies, with more than 39 countries, including New Zealand, identified as having or having had cluster initiatives (van der Linde, 2003). A series of strategies to encourage cluster development have operated in New Zealand since the early 1990s, culminating in a national Cluster Development Programme which operated between 2003-2006 with an annual budget of \$1 million (Ministry of Economic Development, 2005). At present New Zealand Trade and Enterprise operates an Enterprising Partnerships Fund that makes funds available on a contestable basis to regional economic development agencies for initiatives seeking to 'further the creation or exploitation of regionally based collaborative partnerships and networks, and other regional institutions, that promote knowledge sharing, facilitate innovation processes and grow international connections' (Mallard, 2007, p.8). Taking the Wellington region as an example, until 2007 the region's economic development agency supported six clusters as part of its Sector Growth programme, namely Tertiary Education, Earthquake Engineering New Zealand, Creative Manufacturing, Information Communication Technology (ICT) Wellington, Natural Hazards New Zealand and LandNZ (Positively Wellington Business, 2006a; 2006b).

Whilst the credibility of Porter's definition of clustering is uncertain, there is no doubt that the phenomenon of agglomeration exists, whereby firms within the same or closely related industries tend to assemble (referred to alternatively in the literature as concentrate, agglomerate, co-locate or cluster) in certain places (Malmberg and Maskell, 2001). There has been considerable scholarly interest in this phenomenon since the 1990s, with the relationship between spatial proximity and innovation, or knowledge, a common area of curiosity (e.g. Boschma, 2005; Rallet and Torre, 1999). Associated with the geography of innovative behaviour is the concept of 'tacit knowledge' developed by Michael Polanyi (1966), described as 'disembodied know-how that can only be diffused in personal interaction and face-to-face contacts' (Hauser *et al.*, 2007, p.76). Geographic proximity facilitates face-to-face contact and social networking, resulting in the transfer of knowledge, especially tacit knowledge (Schutjens and Stam, 2003). Indeed some theorists suggest that the strong tacit component of the knowledge imbued in leading edge industries makes spatial clustering essential to facilitate the sharing of knowledge, contributing towards innovative behaviour (Maskell and Malmberg, 1999). For a number of scholars, this process helps to explain why there is geographic concentration of certain industries in particular places despite the processes of globalisation and the availability of cheaper and more widespread communications technologies (Gertler, 2007).

Networking is a valuable method of collecting information, and for emerging firms, which are small and have few employees, networks can facilitate successful growth and help overcome the liability of newness and smallness by providing access to opportunities and resources (Hite, 2005; Johannisson, 1996). Certainly entrepreneurs starting an enterprise devote considerable efforts to building personal networks in order to mobilise resources,

promote their business and build self-confidence and legitimacy (Johannisson, 1996; Schutjens and Stam, 2003). There is thus a growing realisation that the networks of owner-managers form a resource for the firm and that the socially embedded relationships of owner-managers are often used to support business activities (BarNir and Smith, 2002).

For the purpose of the present study, socially embedded relationships are defined as the ties between the business owner-manager and other individuals that are set in social relationships and influence the firm's economic decision making. Whilst business relationships are governed by formal mechanisms (such as a contract or memorandum of understanding), these socially embedded relationships are influenced by informal mechanisms (such as trust or reciprocity). The close networks of a business owner include a combination of social and business relationships, with various studies suggesting that this combination can differ between countries (Birley *et al.*, 1991; Drakopoulou Dodd *et al.*, 2002). Studies have also identified that the content of networks evolve over the lifecycle of the firm (Birley *et al.*, 1991; Hill *et al.*, 1999). At an early stage in a business's development, entrepreneurs rely heavily on family, friends and social contacts, but as time moves forward their networks expand to include more business focused contacts. A recent study of entrepreneurial networking behaviour found networking behaviour may differ among entrepreneurs living in different cultures (Klyver *et al.*, forthcoming).

To understand the different types of relationships within a network, Granovetter (1973) provides a useful approach. He defines two types of relationship, the first being between people who have frequent contact and deep involvement (e.g. close friends) as *strong ties*, and the other being loose and occasional interactions with low commitment (e.g. distant acquaintances) as *weak ties*. There are advantages of having strong ties, as these allow for the quick flow of information and provide social support (BarNir and Smith, 2002). However weak ties are especially valuable as they are more likely than strong ties to act as the bridges to new information; weak ties are more prone to connect otherwise disconnected groups and therefore provide access to more information, that is unique and valuable, and to new contacts (Burt, 1992; Castilla *et al.*, 2000). To obtain information from distant parts of the network, it is important that entrepreneurs have weak ties with diverse contacts, whilst networks consisting of homogeneous contacts will usually provide information of limited scope (Birley *et al.*, 1991; Hauser *et al.*, 2007). Therefore the socially embedded network ties between individuals or entrepreneurs, as agents of the business, influence the economic decision-making of the business, and are as necessary as business or commercial relationships. Storper (1997) similarly suggests that network ties can be distinguished by traded and non-traded interdependencies, with traded interdependencies explaining economic interactions such as local supply networks, and non-traded interdependencies covering other aspects of informal networking, such as keeping in contact with past work colleagues (Bassett *et al.*, 2002).

If proximity is believed to be important to the transfer of knowledge, by facilitating formal and informal interaction between parties, resulting in the enhancement of potential economic value, then the implication is that a firm's choice of location is significant. Key location criteria for businesses are believed to be accessibility and the cost/availability of relevant labour and premises (Gordon and McCann, 2000). More specifically, for businesses operating in certain industries, such as business services, it is also important to be located close to clients (Koschatzky and Zenker, 1999).

If the location decisions of the founders of new businesses are examined then it appears that most choose to start out where they are living at the time. This behaviour can be explained by a number of reasons, including that the home region is the place in which market opportunities have been discovered, where the entrepreneur is known locally, making it easier to gain access to capital and other resources needed to start the

business, and that as there will initially be no income, the choice of location is conditioned by personal motives and networks (Malmberg and Maskell, 2001; Stam, 2006). In addition Oakey *et al.* (2001) suggests that for the founders of high tech firms, places of high personal amenity value are also desirable as work and home environments, leading to more suitable locations from an economic efficiency viewpoint being overlooked. In general though, the founders of new firms seek to avoid risk, and tend to choose locations that offer appropriate accessibility (e.g. by car), site characteristics (e.g. price) and group-specific accessibility (e.g. to customers) (Nijkamp and van Ommeren, 2004).

Once established it is rare for businesses to relocate from their region of origin, as firms exhibit spatial inertia or lock-in (Knoben and Oerlemans, forthcoming; Malmberg and Maskell, 2001; Stam, 2006). The networks in which firms operate can help to explain this inertia (Knoben and Oerlemans, forthcoming). Firstly, the dependency of a business on other firms located locally can lead to dependency on that location. Secondly, investments in localised networks may be similar to a sunk cost specific to that location, so that firms that have 'invested' heavily in their networks may have a disincentive to relocate. Finally, a firm can also be dependent on characteristics of the region (e.g. the local pool of knowledge), which can also deter relocation.

Yet in spite of spatial inertia, some firms do relocate. It appears that office-related activities are more 'footloose' than firms in the manufacturing sector, where the costs of building and manufacturing are relatively higher (Hoogstra and van Dijk, 2004). Other studies have identified some of the features that can influence the propensity to relocate (Brouwer *et al.*, 2003; Knoben and Oerlemans, forthcoming; Stam, 2006). These include the characteristics of the firm, its premises, site and region, involvement in merger/takeover activity and the size of the firm's market. In addition, Stam (2006) emphasises that decisions to do with relocating are dependent on both the willingness *and* the ability to change.

If a firm relocates, then what is the anticipated effect on its embedded relationships? Knoben and Oerlemans (2005) suggest that there are two possible impacts. On the one hand if a firm relocates towards partners they interact with, then the reduced geographical distance will reinforce their relationship. If a firm moves away from its main partners on the other hand, then the transfer of knowledge will be hindered as tacit knowledge is spatially bound. This problem could be reduced if firms persuade partners to relocate with them. This hypothesis seems to suggest that the relocation of an important partner may compel a firm to reconsider its own location decision in order to maintain spatial proximity and to ensure the effective transfer of information.

Research Methods

The literature on spatial proximity, the embedded relationships of business owners and their location decisions outlined in the previous section is suggestive of several lines of enquiry that could usefully contribute towards the knowledge of the anticipated resiliency of communities at risk from a natural disaster. Understanding that it is important for community recovery that businesses remain in place after a disaster, the overall objective of this paper is to investigate whether the socially embedded relationships between businesses are associated with variations in the likely location behaviour of businesses in a post-disaster scenario, and therefore to ascertain if these relationships have the potential to assist recovery. To explore empirically this thesis, this paper sets out to answer the following research questions of firms studied in the Wellington region:

1. What forms of socially embedded relationships exist between businesses?
2. What has been the location behaviour of businesses to date?
3. To what extent would location behaviour change after a disaster and do socially embedded relationships explain any changes in behaviour?

The empirical part of this study used a combination of quantitative and qualitative methods. A questionnaire was mailed to businesses in the Wellington at the end of 2007 to collect information regarding the characteristics of firms, their networks, distinguishing between strong and weak ties, and their location decisions. To enable the collection of more detailed qualitative data, semi-structured interviews were subsequently carried out with business owners, forming a representative sample of the survey respondents. As the intention of the study was to explore the association between socially embedded relationships and location behaviour, it was decided to survey companies that already demonstrated a propensity to network, exhibiting a tendency to have relationally embedded ties. To achieve this three cluster initiatives supported by the economic development agency, Positively Wellington Business (PWB), were utilised to provide the initial sample of companies: Earthquake Engineering New Zealand, Creative Manufacturing and ICT Wellington. Membership records of each of the initiatives were publicly available on the internet via the PWB website.

Firms in the sample had to meet two criteria. First they had to be independent and privately owned, and second they had to have their head offices based in the Wellington region. Once organisations that did not meet this criteria were withdrawn from the initial sample, and duplicate records and companies no longer trading were also removed, the overall sample size was reduced from 469 to 279. As Baruch (1999) found that surveys mailed to individuals (and about individual characteristics) have a significantly higher response rate, the website of the New Zealand Companies Office was used to identify the owners of each firm in order that questionnaires could be mailed directly to them. An incentive for recipients to return surveys was offered in the form of book vouchers awarded to the person whose name was drawn from all survey respondents. Follow-up telephone calls were made a week after posting surveys to ensure that the response rate and subsequent statistical analysis would be robust. A total of 61 (21.9%) usable completed questionnaires were returned, which is a respectable response rate when compared to similar micro-level studies that achieved about 8% (Knoben and Oerlemans, forthcoming).

Data collected from the surveys was then entered into Excel for statistical analysis and the following basic characteristics were produced to provide a general picture of the firms involved in the survey. The responding firms can be categorised into the three industry groups, namely earthquake engineering (5, 8%), manufacturing (16, 26%) and ICT (40, 66%). The majority of firms that responded were small with 61% of respondents employed 10 or less people, 16% employed 11-20 staff and the remaining 21% employed 21-100. None employed more than 100 employees, and 13% of respondents were the only people working for their company. Only 10% of the companies were less than 2 years old, 48% were between 2 and 10 years old and 43% were established more than 11 years ago. Nearly 80% of companies had been established by the current owner (i.e. the respondent), with the remaining respondents either having bought the company outright, acquired a shareholding or owned the company as a partner in a partnership.

In the second stage of data collection, interviews were arranged with a representative sample of respondents to the questionnaire. Twelve semi-structured interviews were held either at business owner's offices or in a public place, such as a café. The purpose of the interviews was to enable the collection of detailed information on networking behaviour

and location decisions, and more specifically what their location decision would be in the event of significant natural disaster in the region. To elicit data on the relative importance of various location factors, interviewees were presented with a series of location criteria that the literature suggested might be potentially relevant to companies, including for example other companies in the same sector, research organisations and skilled workforce. Using a four-point scale, interviewees were asked to respond how important it was that their firm was located close to each of these factors. The results of the data were analysed to reveal key location drivers. Interviews lasted between about 15 and 45 minutes, with approximately 25-30 minutes being the length of time for half the interviews. The interviews were recorded and then transcribed. The interview transcripts were analysed and this analysis along with findings from the questionnaires are summarised in the next section of this paper.

Research Results

Socially embedded relationships

To learn about the socially embedded relationships of business owners, two groups of questions were asked in the questionnaire. The first sought to identify the owner's propensity to network; this is evidenced by participation in networks and associations such as business networks (e.g. local Chamber of Commerce), professional organisations (e.g. NZ Institute of Chartered Accountants), social clubs (e.g. local Lions club), voluntary organisations (e.g. neighbourhood support groups) and other groups (e.g. church). Respondents reported a high incidence of networking activity as 85% of respondents belonged to some type of club/organisation, and on average respondents belonged to three such groups (see Table 1 for a breakdown of membership of the different types of groups).

Table 1: Membership of networks and associations (n=61)

<i>Business networks</i>	<i>Professional organisations</i>	<i>Social clubs</i>	<i>Voluntary organisations</i>	<i>Other groups</i>
65%	65%	58%	29%	8%

The main benefits of membership of the networks and associations according to interviewees were that they provided access to knowledge, gave them the opportunity to mix with a cross-section of people, and built awareness of their brand or company that could lead to opportunities in the future.

The second set of questions examined the utilization of strong ties. Survey respondents were asked about a maximum of five important personal contacts, excluding employees and fellow shareholders, with whom they discuss business matters. The two most frequently cited types of individual with whom the owner has strong ties are former/current customers (16%) and former/current suppliers (15%), implying that network ties based on traded interdependencies often become the source of untraded interdependencies. In fact this supposition was articulated by one interviewee: 'people I meet in business, they get put into my personal network' (Chief executive: technology company). Fellow members of business networking organisations are the next most common source of close contacts at 13%.

In order to compare the diversity of network contacts with other international studies (see Table 2), the connections in which the owner first met the contact are grouped together: life partners and family are said to be 'family'; contacts met at school/university, introduced

by friends/family or had worked together (as fellow employees or as employer-employee) are said to be 'friends'; and all relationships begun as supplier/customer/competitor plus contacts met through business networks are said to be 'business ties'. This grouping together indicates that 15% of close ties are with family, 42% are friends and 46% are business relationships. Like the Irish, Japanese and Americans, Wellingtonians have a relatively weak reliance on family in their close network ties. However if family and friends are grouped together to form a 'social ties' grouping then Wellington businesses are fairly similar to firms from Greece, in that social ties are more important than business ties. When the geographic isolation of Wellington from major economic markets is considered then it might have been expected that, like Scottish firms, businesses would be more dependent upon family ties.

Table 2: Types of network tie

	<i>Wellington</i>	<i>Scotland</i>	<i>Northern Ireland</i>	<i>Greece</i>	<i>USA</i>	<i>Japan</i>	<i>Italy</i>	<i>Sweden</i>
Family	15	24	13	31	14	13	24	23
Friends	42	15	32	35	50	45	28	32
Social ties (sub-total)	57	39	45	66	64	58	52	55
Business ties	46	61	55	34	65	60	54	54
Other	5	n/a	0	n/a	6	4	2	22
Total (%)	108	100	100	100	135	122	108	131

Source: Drakopoulou Dodd *et al.* (2002)

Note: Multiple responses were permitted in some studies where totals do not add up to 100%

It is evident from the survey that networks evolve over the lifecycle of the firm (Birley *et al.* 1991; Hill *et al.* 1999). In newly established companies, social contacts, especially family, are particularly important, but as time progresses, the importance of social contacts diminishes and business contacts play a greater role in the owner's close network (see Table 3). When the duration of relationships with close contacts are examined, it is observed that the more recently started relationships tend to be with business contacts. Older relationships, on the other hand, are dominated by family and friends.

Table 3: Types of network tie in relation to company's age and length of relationship

	<i>Company age</i>		<i>Length of relationship</i>	
	<i>Less than 2 years</i>	<i>11+ years</i>	<i>Less than 1 year</i>	<i>20+ years</i>
Family	24	13	8	47
Friends	44	32	0	40
Social ties (sub-total)	68	55	8	87
Business ties	34	47	75	13
Other	0	8	17	0
Total (%)	100	100	100	100

The survey also asked for details of the amount of time spent maintaining and developing key business relationships, on which comparable international data exists. On this point, it was found that the time spent maintaining relationships with new customers and developing new relationships with potential customers is generally lower than in other countries (see Table 4). In the Wellington study, the average hours per week spent on existing relationships was 6.5, whilst only 2.7 hours per week was expended on potential relationships, lower than all countries with the exception of Japan. In addition businesses in Wellington are most like Scottish firms in that they spend considerably more time on maintaining existing relationships rather than nurturing new ones. For businesses located in other countries the time spent on the two types of relationships is more equal.

Table 4: Average hours per week spend on maintaining and developing relationships with customers

	<i>Wellington</i>	<i>Scotland</i>	<i>Northern Ireland</i>	<i>Greece</i>	<i>USA</i>	<i>Japan</i>	<i>Italy</i>
Existing customers	6.5	12.9	10.4	15.7	5.8	4.3	12.0
New customers	2.7	2.9	8.3	9.2	5.6	3.6	11.5
Total	9.2	15.8	18.7	24.9	11.4	7.9	23.5

Source: Drakopoulou Dodd *et al.* (2002)

The spatial proximity to these close contacts covers a wide range of distances (see Table 5), but it can be concluded that about three-quarters of close contacts are located within the Wellington region.

Table 5: Distance between business owner and their close contacts (n=61)

<i>0-1km</i>	<i>2-5km</i>	<i>6-10km</i>	<i>11-20km</i>	<i>More than 20km</i>
24%	19%	14%	16%	26%

It should be noted that the businesses included in the survey are heavily dependent on the Wellington region for sales and supplies in terms of value. 41% of survey respondents stated that more than three-quarters of their supplies in terms of dollar value came from within region, and 53% expressed that more than three-quarters of their sales in dollars stayed within the region. However when asked where their single largest supplier was located, exactly a half of respondents said that they were based more than 20km away and therefore presumably outside the region, and in terms of location of their largest customer, 42% stated it was also located more than 20 km distant.

Location criteria

As anticipated in the literature, two-thirds of the survey respondents indicated that the reason for locating their business in Wellington was that they were already living in the region (MalMBERG and Maskell, 2001; Stam, 2006). Nearly a quarter (23%) of respondents manage their business from home, and a further 30% operate from within the Wellington CBD. At some time in their progress about 60% of businesses had moved location, with more than half of relocated firms (57%) having moved to a new location in the previous 5 years. The distance moved tends to be small; 53% of companies that moved relocating less than a kilometre from their old address, and a further 28% moving between 2 and 5 km. The most commonly expressed reason for the relocation was to gain more space. Businesses in the manufacturing sector were only slightly less likely to have moved premises than the office-based businesses of earthquake engineering and ICT (56% of manufacturers moved, compared to 62% earthquake engineering and ICT combined). This result suggests that this study does not confirm the finding of Hoogstra and van Dijk (2004) that office-based activities are more likely to relocate than manufacturers.

Proximity to clients/customers was the most frequently given reason of survey respondents for their current choice of location, cited by 36% of respondents. Yet interestingly, when interviewees rated the location criteria according to importance being situated close to customers and clients was not rated as highly as might have been anticipated from the results of the survey (see Table 6). An explanation for this is that the main sales markets for three of the twelve companies interviewed are overseas, and as a result owners of two companies rated being close to customers as being 'very unimportant' to them, raising significantly the mean for this criteria. The small size of the sample (N=12) make it difficult to draw comparisons between industries. Koschatzky and Zenker (1999) suggest it is more important for in the business services sector to be located close to clients/customers, and certainly 9 out of the 10 interviewees that own businesses operating in the ICT and earthquake engineering sectors said that it was either very important or important to them to be near to their clients/customers. However with only two companies interviewed from the manufacturing sector it is problematic to derive substantive comparisons of behaviour between the manufacturing and services sectors.

Table 6: Interviewees' assessment of the importance for their business of being located close to these factors (N=12)

<i>Location criteria</i>	<i>Mean</i>	<i>Standard deviation</i>
Good broadband and other business infrastructure	1.17	0.39
Family and friends	1.58	0.67
Suppliers and sub-contractors	1.75	1.08
Skilled workforce	1.83	0.83
Good social scene	1.92	0.67
Attractive natural environment	1.92	0.79
Good transport links within region and to other parts of NZ	1.92	0.79
Customers and clients	1.92	1.08
Attractive urban environment	2.00	0.95
Council or economic development agency supportive of businesses	2.25	0.75
Good supply of companies offering professional services (e.g. accountants)	2.42	0.79
Government departments	2.42	1.08
Affordable housing for employees	2.50	0.80
Networking organisations	2.50	0.80
Other companies in same industry sector	2.67	0.78
Research organisations	2.83	0.39
Universities and other higher education providers	2.83	0.58

Note: Response categories: (1) very important; (2) important; (3) unimportant; (4) very unimportant

It is also interesting to note that factors that relate to personal amenity value (i.e. family and friends, good social scene, and attractive urban and natural environments) are rated very highly by interviewees, suggesting that amongst this group more economically efficient locations might be overlooked (Oakey *et al.*, 2001). However only one interviewee articulated this perspective:

It would make total sense for us as a company to relocate, economically to relocate to the UK. It would be completely impossible to do it. It would make sense, but it wouldn't work while we've got one of our shareholders is a dye-in-the-wool Palmerston person, who would never move in a thousand years to Wellington, let alone to the UK. And none of the rest of us really want to go back to the UK (CEO, software development company).

Analysis of the interview transcripts reveals that in fact three-quarters (9) of interviewees believe it makes sense economically for them to be located in the region, and five of the 12 owners claim that the region is their biggest market. It would seem then that for most of the business owners interviewed being based in Wellington gives them the best of both worlds: they live and work in an attractive and vibrant place, close to family and friends, and it is economically efficient to be located here.

If the personal amenity criteria are removed, then the results of the analysis come closer to what would be anticipated from the literature, namely accessibility, availability of labour, and group-specific accessibility (e.g. to customers/suppliers) (Gordon and McCann, 2000; Nijkamp and van Ommeren, 2004). However an unanticipated feature of the study is the overriding concern of all of the business owners interviewed that their business should be situated in a place that had a good broadband network and other business infrastructure.

Certainly in other markets the quality of telecommunications is considered an important factor when deciding where to locate a business¹, but not to the extent indicated in this study in which it was found to be the single most important criteria. Perhaps the significance of this criteria in Wellington is a result of the isolation of NZ from the rest of the world, increasing the requirement for high quality telecommunications and other forms of communications technology.

Post-disaster location decisions

Emphasising the significance of infrastructure to businesses, three-quarters (9) of interviewees anticipated that it would be essential that connectivity and/or power services were resumed quickly after a natural disaster. For example: 'I could run the business from the wreckage of my house, as long as I had some connectivity which would be doubtful probably' (CEO, software development company), and 'we would be needing to relocate the more physical aspects of the business to somewhere which had connectivity and that kind of thing' (General manager, web development company).

Even if power/connectivity were resumed, half (6) of the interviewees confessed that they would consider either relocating or setting up satellite offices outside Wellington if major clients/customers left the region as they would want to maintain face-to-face contact. For example: 'at the end of the day we'd be guided very much by what government departments are doing. Because they're our major customer, we'd be guided by where they ended up I suspect' (Director, IT consultancy), and 'it would depend to a large degree on our major client base, what their intentions were. It would only take one or two major ones to say 'we're out of here', and we would be forced to review things at that point, yes. We are very much, we would be a follower in that regard' (Director, manufacturing company). Of note here is that five of these six companies that would leave the region are in the ICT sector and the remaining one is a manufacturer, indicating that as predicted in the literature office-based activities companies are relatively 'footloose' (Hoogstra and van Dijk, 2004).

Of the six interviewees who would not consider relocating in order to be close to clients/customers, two were owners of structural engineering consultancies, envisaging that rebuilding work in the region after a significant disaster would make it essential for commercial reasons to remain, for example 'because we're structural engineers if there was some sort of disaster usually that affects the structure of buildings and things, so we'd be in high demand. So there would be clients here even if they were not the usual ones' (Director, structural engineering consultancy). For three of these six interviewees, their main markets were outside NZ, and so maintaining a close physical relationship to clients/customers was not a consideration, but relocating temporarily outside the city if there was no power or the city was totally destroyed would be an option that two of them said they would consider. The final individual whose business was entirely web-based, would only consider leaving the region if friends and family left the region: 'the propensity to move somewhere else would be much stronger if they were personal networks that had everyone migrating....business networks can up and move and that wouldn't really create a momentum for us' (CEO, web-based service company).

Whilst proximity to organisations with which a business has a traded interdependency seems important to some types of firm in a post-disaster situation, remaining physically close to organisations where the relationship is an untraded interdependency is less

¹ In a Europe-wide study of essential factors to consider when locating a business, quality of telecommunications was the fourth most highly rated factor behind (1) easy access to markets, customers or clients, (2) availability of qualified staff, and (3) transport links with other cities and internationally (Cushman & Wakefield, 2006).

important. When asked how dependent their decision to relocate was on the people in their close networks, two-thirds (8) of interviewees declared that it would not be.

Discussion and Conclusions

Previous studies of disasters show that the economic impact of a disaster is difficult to forecast, but that certain factors are likely to be important, such as the strength of the local economy or proximity to local labour markets. At the micro level, the characteristics of a firm have also been found to influence the resilience of individual businesses to natural disasters, and these include the market in which a firm operates, as firms that rely heavily on local markets are particularly vulnerable. In order to continue trading after a disaster, businesses also depend on customer-supply chains being undisrupted, and therefore maintaining trading relationships becomes an important aspect of recovery. This seems to signal that learning more about economic relationships is worthwhile when trying to anticipate the resilience of a community to a natural disaster.

A study of the theoretical literature suggests that being located close to other companies/organisations is important, despite some theorists' suggestions that this is no longer the case. Economic development policies that promote 'clustering' behaviour and improving relationships between spatially proximate businesses are popular, encouraging contact or networking between organisations and therefore the diffusion of tacit knowledge. In trying to understand networking behaviour, it is useful to look at the characteristics of networks, for example, strong or weak ties, and traded or untraded interdependencies, to explain the nature of relationships.

This paper has described and discussed the nature of the relationally embedded ties of businesses and the location decisions of firms based on an empirical study of businesses located in the Wellington region. Three questions were posed:

1. What forms of socially embedded relationships exist between businesses?
2. What has been the location behaviour of businesses to date?
3. To what extent would location behaviour change after a disaster and do socially embedded relationships explain any changes in behaviour?

To address the first question, this study explored the strong and weak ties of the networks of firms in three industry sectors. As the sample of firms was drawn from clustering initiatives in Wellington, it was anticipated that firms would portray a high propensity to network, and indeed this was the case as 85% of business owners surveyed participate in clubs and organisations of one kind or another. With theorists such as Granovetter proposing that new knowledge is more easily transferred through loose contacts rather than close friendships, then the propensity of owners to network suggests that study firms would be benefitting from these weak ties as new information circulates more readily through weak ties than via strong ties.

When it came to examine the nature of their strong ties, details were requested about the people that business owners would talk to about business matters. As the data collected could be compared to similar international studies, the results were intriguing. Firstly the results of this study suggest that compared to firms based in other countries NZ companies under-utilise business ties and over-use social ties in their close networks. Secondly, in a country that is physically isolated from world economic markets, it might have been anticipated that NZ business owners would rely heavily on family members for business support/advice as had been found in a similar study of companies based in the remote Scottish region of Grampian (Drakopoulou Dodd *et al.*, 2002). The study of firms in Wellington found, instead, that businesses had comparatively low use of family ties, whilst

friends are very influential. A further inconsistency in the data is that, in spite of the seeming importance of business relationships as a source of people that NZ business owners rely upon for support/advice, very little time is spent maintaining these critical traded dependencies when compared to the owners of firms in other countries (Drakopoulou Dodd *et al.*, 2002).

In other ways though, the businesses studied exhibit behaviour similar to that identified elsewhere, as the use of social ties is relatively high in newly established firms. Also reflecting the findings in other places, as companies develop, business owners depend less on social ties with business ties becoming increasingly important as sources of support (Hill *et al.*, 1999). The data collected also suggests that as their companies develop the owners of Wellington firms increasingly turn to customers and suppliers for advice and support, transforming relationships based on traded dependencies into untraded dependencies over time (Johannisson, 1996). As might be expected from a sample drawn from local clustering initiatives, fellow members of business networks are also a key source of strong ties.

Certainly the businesses surveyed seem to be heavily embedded in the Wellington region. Approximately three-quarters of their strong ties are based in the region, suggesting that tacit knowledge can be transferred easily between contacts as ties are in close spatial proximity (Schutjens and Stam, 2003). The responses of survey respondents indicate that many firms depend heavily on local supply and sales networks, which would have implications in the event of a natural disaster hitting the region. If this was to happen, then these networks are likely to face considerable disruption, affecting the ability of Wellington firms to conduct their business normally.

In answering the second research question, it was found that based on past experience the businesses surveyed do not exhibit spatial inertia with 60% of all firms surveyed having moved location at some point, although the distances moved tended to be very small. However as one of the criteria for selecting the sample firms was that they were based in Wellington, it is difficult to draw firm conclusions on the extent of any lock-in, as firms that had left the region would have been excluded from the survey.

Having a location that is close to clients/customers appears to be valued. The data gathered during the interviews creates a more detailed picture of the factors that business owners believe are important to be nearby. In addition to the predictable features of accessibility, availability of labour and group-specific accessibility, factors that relate to personal amenity are particularly valued by Wellington business owners. Furthermore considerable weight is placed by business owners on having effective communications and other infrastructure, and it could be surmised that this is a result of the isolation of the region from the rest of the world.

The final question addressed whether firms' location decisions would change in the event of a disaster. Restoring connectivity and power would be essential for firms to resume operations in their normal location after a natural disaster. It seems especially important for some types of business to remain in a place hit by a major natural disaster, particularly if their line of business would be involved in the repair and recovery of the region. For others whose markets are based outside the region hit by a disaster, there also appears to be less necessity to move away unless the damage to infrastructure is devastating. Yet for many businesses, especially those offering business services, it appears that remaining in close spatial proximity to clients is important. In this way an owner's decision to stay or leave the region after a major disaster would be dependent on the relocation plans of major clients/customers, such as government departments.

In a post-disaster situation, relationships based on untraded interdependencies seem not to be as important as maintaining relations and spatial proximity with key trading partners. Therefore as suggested by Knoblen and Oerlemans (2005), business owners envisage that if they relocate their businesses towards firms with which they have traded interdependencies, then the reduced geographical distance will enhance their relationship. If they fail to move with their main trading partners, then they predict that the relationship will suffer, having serious outcomes for the firm.

Maintaining good working relationships with clients/customers by being in close proximity to them has been found to influence the location decisions of businesses under both normal circumstances and in a post-disaster scenario. Although the interview sample was small, the evidence collected indicates that a business's trading relationships and its markets would have a notable impact on its choice of location after a significant natural disaster. Whilst social relationships seem particularly important to business owners in Wellington, especially when they are establishing their businesses, it appears that they would not influence the choice of location after a disaster and therefore would not encourage firms to remain in the region. Socially embedded relationships between businesses would only assist community recovery if organisations remain in a disaster-hit area, enabling the transfer of information and the provision of support. If organisations decide to relocate, then they will probably be followed by suppliers and contractors, adversely affecting community recovery especially if there is a snowballing effect. The economic relationships between firms therefore have important implications for the resiliency of communities in vulnerable places.

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