

Synergistic model to boost business performance: a New Zealand case study

Business
symbiosis and
MSME
performance

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Abstract

Purpose – This study investigates whether there is an association between business symbiosis and the performance of micro, small and medium enterprises (MSMEs).

Design/methodology/approach – The authors conducted 200 surveys, using ordered logistic regression to evaluate the results. Participants are MSME business owners in Cambridge, New Zealand.

Findings – The authors found that connections with banks and other businesses in the same and across different industries, positively associates with changes in MSME profitability. Additionally, operating a business as a franchisee under the regulations or headquarter issued rules is positively associated with change in net profit.

Originality/value – While there are limitations with cross-sectional data, the study indicates a mechanism and frameworks for policy analysis when deciding on allocation of funds to particular networks.

Keywords Synergistic model, Symbiotic relationship, Business performance, MSME

Paper type Research paper

1. Introduction

Potential mechanisms for micro, small, medium enterprises (MSMEs) to boost returns and reduce risk through cooperative working relationships have many forms. Chambers of commerce, trade associations and governmental organisations often act as intermediary nodes for information exchange and cooperation, yet MSMEs are pushed into critical regions by the challenges of increasing competitiveness (Vahlne and Johanson, 2017), limitations of resources and finance, and informational opacity (Chen *et al.*, 2016). Thus the potential for localised symbiosis among smaller businesses to reduce risk and enhance returns through profit and cash flow warrants examination (Wasiuzzaman, 2019). New Zealand's official statistics indicate a ten-year survival rate for businesses ranges from 19 to 36%, depending on the industry. MSMEs in the 5 years from 2015 onwards experienced ranked failure rates of micro 55%; small 44%; medium 39%, whereas larger businesses perform better at 20%.

To overcome these problems, many MSME owners discard “flying solo” and adopt a synergistic model of working to benefit from cooperative behaviour. Adopting symbiosis as a strategic tool improves profitability, business survival rates, goodwill and growth potential (Watson (2011) as well as potential risks related to the limitations of firm size (Banwo *et al.*, 2015). Joint ventures enhance the bottom line and help businesses to be successful with



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favourable outcomes for individual firms, localities and nations through greater incomes, employment and stability (Geason *et al.*, 2006).

Prior MSME networks and symbiosis research identifies that business performance is affected by frequency of contact (Tan *et al.*, 2015), time of cooperation (Cygler *et al.*, 2018), number of contacts (Semrau and Werner, 2012), type of contact (John, 2007), activities to attract network partners (Sepulveda and Gabrielsson, 2013) and position in a network (Surin *et al.*, 2012). A synergistic model associates with other factors such as social abilities and the form of connections (Garidis and Rossmann, 2019).

The next section provides a literature review, followed by the research methodology, presentation of empirical results, followed by a discussion of their significance and concluding highlights of contribution to theory and literature.

2. Literature

While many business owners use different strategies to enhance business performance, the idea of cooperation is widely adopted as it seems to provide long-term business sustainability. Typically, small business owners increase their knowledge when they associate with owners of other firms (Naudé, 2014). Peer association can also boost firm performance and increase sales growth and returns (Kohtamäki *et al.*, 2013) and inter firm networking can expand market share from domestic market to the international market (Johanson and Mattsson, 2015). An obvious advantages of interacting symbiotically with other firms is achievement of potential cost reductions, reduced expenditure (Dussauge *et al.*, 2010) and resource gains (Garcia and Velasco, 2002). When costs or expenditure are reduced, the returns of a business tend to increase.

In addition, there are links between an enterprise's financial returns and symbiosis. Concentrated cooperation among different entities and a variety of stakeholders interacting in business networks supports the development of firms (Srečković, 2018). In the real business world, entities interact in different forms so that the presence of symbiosis can be revealed by various indicators and different types of symbiotic relationships associated with firm performance.

For instance, Watson (2011) uses the range and intensity of networks to indicate the existence of business symbiosis. Network range is measured by connections with other businesses within the same industries, across different industries and the industrial associations to which businesses belong. Network intensity is demonstrated by frequency of interaction with other businesses within the same industries and with businesses across different industries. Formal and informal networks are also positively associated with firm survival, and formal networks are associated with firm growth. Further, networks built with local firms increases the speed of entering international markets (Prashantham *et al.*, 2019).

While cooperative relationships can increase the value of firms (Garidis and Rossmann, 2019; Wu *et al.*, 2020; Zacharia *et al.*, 2019), negative issues emerge in terms of reducing control or forfeiting traditional approaches to wealth management (Bengtsson and Kock, 2000; Etemad *et al.*, 2001). Also, internal information and business strategies can be leaked via cooperating networks (Bouncken and Fredrich, 2016; Gnyawali and Ryan Charleton, 2018). Linked cooperative relationships among key competitors are positively associated with a firm's performance. However, disadvantages outweigh advantages if there are too many competitors (Ritala *et al.*, 2008) which can generate conflict, argument and eventually dissolve cooperative relationships.

Four hypotheses are thus formulated:

H1. Connections between businesses within the same industry enhance businesses performance;

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- H2. Connection between businesses across different industries enhances business performance;
- H3. Frequency of interaction with firms within the same industry enhances businesses performance;
- H4. Frequency of interaction with firms across different industries enhances businesses performance.

Significantly, symbiotic relationships are also found when firms have connection with banks or financial institutes. Petersen and Rajan (1994) note that, for small businesses, such connections can take the form of raising a loan, buying financial products, purchasing financial services and maintaining cheque and savings accounts as well as monitoring cash flow.

The strength of relationships between small businesses and banks is measured by the number of bank contacts in daily business transactions (Ongena and Smith, 2000). Indeed, firm and bank connections may reduce information asymmetry and assist bankers to evaluate the financial health of businesses (Boulanouar *et al.*, 2020), most effectively when trust is built between entrepreneurs and bankers, by improving access to finance and reducing borrowing costs (Hernández-Cánovas and Martínez-Solano, 2010). Symbiotic associations also assist banks to reduce the probability of credit outcome deterioration (Degryse *et al.*, 2017).

Another perspective relates to the number of banks in contact with a firm. A relationship with just one bank increases a bank's monopolistic power which leads to difficulty in seeking financial support from other financial institutes (Farinha and Santos, 2002) and if long-term, can produce holdup issues, reduce the bargaining power of a company to negotiate a reasonable interest rate (Beatriz *et al.*, 2018; Everett, 2015), lead to lending constraints from other financial institutions because of information asymmetry and make refinancing more difficult (Detragiache *et al.*, 2000). Yet contact with several banks can produce adverse selection and moral hazard since reliable information can reduce firm profit. Based on this literature a further hypothesis is formulated:

- H5. Connection with banks positively associates with business performance.

Industrial association is one indicator representing business symbiosis. Inmyxai and Takahashi (2010) note that being part of trade or industrial associations indicates networking. Social ability also links with business symbiosis and can affect a firm's performance in terms of an owner's social abilities in associating with other business owners for business purposes. Social skills are important enabling tools individuals to use to interact with others. Interpersonal social networking abilities positively affect internationalisation activities and overseas business transactions (Masiello and Izzo, 2019). Personal characteristics, such as effective communication skills, are also important for developing network relationships (Johannisson, 1988). Four social skills are important for networking: *social perceptiveness*, the ability to identify others' emotions and intentions; *impression management*, the skill to create an impression on others while connecting with them; *persuasion and social influence*, the ability to motivate or change others' opinions or attitudes in relation to a desired goal; and *social adaptability*, an ability to adapt to the current situation (Baion and Marfcmán (2000). People who lack social connection ability may be less likely to succeed as entrepreneurs (Boudreaux and Nikolaev, 2019). Moreover, social networking abilities are very effective for female entrepreneurs (McAdam *et al.*, 2019).

Participation in industrial associations and interconnections between firms can be undermined if a free-riding problem exists, reducing the benefits of connection and minimising stakeholder engagement. The intensity of free-riding depends on the components

and characteristics of each entity as well as ethics and trustworthiness of stakeholders. However, if benefits are widely offered to all parties, then synergic cooperation will have a long-term positive impact on a firm's performance and overcome potential negative effects of free-riding. Free-riding is found in dense and cohesive rather than in sparse social networks since close tie networks maintain their relationships based on trust. However, people in a larger group with a lower network density have limited emotional ties and the ability to interact with others depends on how many social ties they can manage (Granovetter, 2005). Based on these arguments in the literature two hypotheses are formulated:

H6. Participating in industrial association enhances businesses' performance.

H7. Social abilities enhance businesses' performance.

Geographical proximity offers the opportunity for entrepreneurs to interact with each other in daily activities (Sorenson, 2018). Localised attendance at workshops, training, formal meetings and seminars organised by particular groups, clubs, associations, organisations or corporations enhances business symbiosis. Participation in these activities is critical for the formation of networks and can help to build relationships with external groups of people (Dodd, 1997; Donckels and Lambrecht, 1995). Such participation allows business owners to access and exchange information with different people, further increasing opportunities to find business partners, contractors, intermediaries and clients (Premaratne, 2002). It also increases the chance of receiving more opportunities in terms of knowledge and know-how (Hertog, 2000). The possibility of increasing returns then is lower for those without such relationships and does not join business associations.

Attendance at social network activities also affects firms' performance. For instance, young business owners tend to participate in closed associations of family and friends rather than open networks that include more diverse entities since their options are limited (Anderson *et al.*, 2016; Edelman *et al.*, 2016). As risk takers, open to new opportunities from outside sources, the younger generation is less likely to socialise with older-aged business owners and is enthusiastic about being involved in all areas of business activities that might increase opportunities to operate successfully (Kourtis *et al.*, 2012) and participate in workshops or training organised by associations to which they belong. Participation also depends on institutional factors of regulatory and normative limitations of association (De Clercq *et al.*, 2010). Based on these arguments the following hypothesis is formulated:

H8. Attending workshops, trainings and events enhances businesses' performance.

Word of mouth information passed from person to person by oral communication also links with business symbiosis, relates to indicating relationships among different entities in the symbiotic environment by signalling opportunities and uncertainties in business networks to other parties. From a financial perspective, word of mouth referrals from one buyer can increase the number of customers (Kumar *et al.*, 2010). Word of mouth is one of the important elements in transferring news and information in symbiotic relationships among businesses, particularly in weak tie relationships (Rogers, 1995). The strength of weak ties in distant relationships between individuals tends to spread word of mouth communication in a network (Brown and Reingen, 1987). Business symbiosis is also found in franchising relationships because franchisees that work under the interaction between a franchisee and headquarters' control or wholesalers' regulations is critical for legitimacy and is beneficial to firms. However, working under the authorisation of the headquarters can delay improvements growth trajectory limit competition and fundraising opportunities (Ziółkowska, 2017). Based on the arguments in the literature these hypotheses are formulated:

H9. Word of mouth enhances businesses' performance;

H10. Operating a business under the regulations or rules of headquarters as a franchisee enhances businesses' performance.

3. Methodology

3.1 Data and samples

This study is based in the town of Cambridge, New Zealand. A simple random technique was used to select 200 owners who operate businesses in the different industry sectors from the population of 1,017 MSMEs. Primary data were collected by closed and open-ended questions. Respondent MSMEs were categorised according to Australia and New Zealand Standard Industry Codes (ANZSIC).

The Cambridge Chamber of Commerce, a collaborating hub for local MSMEs facilitated offered the researcher an opportunity to make contacts and appointments for data collection as well as sending introductory emails to every member to explain the study's purpose and consent forms. These processes substantially reduced the possibility of rejection by potential participants and enabled effective data collection.

3.2 Measurement of variables

3.2.1 Performance variable (dependent variable). Measures of MSME performance, return on equity (ROE) and return on asset (ROA) ratios tend to be distorted by the large amounts of quasi-equity (loans from owners and owners' personal) guarantees on debt. To overcome this, change in net profit as a self-determined response to record participants' perception of their business performance is chosen as a metric for the categorical variable, ranked on an ordinal scale and segmented as: making some loss, making no profit, gaining some profits, gaining significant profit.

3.2.2 Business symbiosis variables (independent variables). Following (Bengesì and Le Roux, 2014), network range and intensity asks participants whether their businesses have connections with other businesses for business purposes and their frequency of interaction. Network range includes three variables. The first captures connections with businesses within the same industry (*CON_SAME*). It is a dichotomous metric which equals 1 if a business has connections with businesses within the same type, otherwise 0. The second variable records connections with businesses across different industries (*CON_DIFF*). It equals 1 if a business has connections across different type, otherwise 0. The third variable registers connections with banks and financial institutions covering daily bank transactions; loan and financial support; financial products and services (*CON_BANK*). It assumes a value 1 if MSME has at least one of these three activities, otherwise 0.

In contrast, network intensity engages two variables. First is the frequency of interaction with firms within the same industries (*FREQ_SAME*). It is a categorical variable (1 = Never; 2 = Occasionally; 3 = Frequently). Second is the frequency of interaction with firms across different industries (*FREQ_DIFF*), which is a categorical variable (1 = Never; 2 = Occasionally; 3 = Frequently).

The industrial association variable shows the number of industrial association memberships of an MSME (*INDUS ASSO*). As a categorical variable (1 = 1 association; 2 = 2-3 associations; 3 = More than 3 associations; 4 = Not a member of any association).

Social ability and skills to associate with other business owners (*SOCIAL*) has four attributes: social perceptiveness (ability to identify others' emotions and intentions); impression management (the skill to create an impression on others while connecting with them); persuasion and social influence (the ability to motivate or change others' opinions or attitudes); and social adaptability (ability to adapt to current situations). As a dichotomous variable, based on self-assessment of participants it equals where one of the four attributes

are presented as 1 if participants have at least one of the four attributes providing a positive impact on MSME's performance; otherwise 0.

Attendance is a dichotomous variable to record activity participation at workshops, training, trade fairs and seminars (*ATTEND*). It equals 1 if participants attend at least one out of four activities; otherwise 0.

The word of mouth variable traces referrals among MSMEs networks and contains two attributes: received referrals from other businesses and referrals to other businesses (*WOM*). This variable is equal to 1 if participants have at least one attribute.

Franchising may exhibit many of the attributes deemed to reflect symbiosis (*FRAN*). As a binary variable it is equal to 1 if a business operates as a franchisee; otherwise 0.

3.3 Descriptive statistics

The overall change in net profit of firms has a high standard deviation indicating significant variability of the change in net profit. The mean value of the change in net profit indicates that the performance of many companies varies between those that make no profit and those achieving some profit (see [Table 1](#)).

Variables	Category	Number	Mean	Std. dev	Min	Max
<i>Dependent variable</i>						
Change in net profit (NP)	1 = Makes a loss 2 = Makes no profit 3 = Gains some profits 4 = Gains significant profits	200	2.68	0.91	1	4
<i>Explanatory variables</i>						
<i>Characteristics of business owners</i>						
Age of business owner (OWNER_AGE)	1 = less than 40 2 = 41–60 3 = More than 60	200	1.92	0.72	1	3
Gender of business owner (GENDER)	1 = Male 0 = Female	200	0.44	0.49	0	1
Nationality of business owners (NATION)	1 = New Zealander 0 = Non-new Zealander	200	0.85	0.35	0	1
<i>Firm attributes</i>						
Firm age (FIRM_AGE)	1 = Less than 1 year 2 = 1–5 years 3 = 6–10 years 4 = 11–20 years 5 = More than 20 years	200	3.47	1.12	1	5
Firm size (SIZE)	1 = Fewer than 5 employees (micro) 2 = 6–9 employees (small) 3 = More than 9 employees (medium)	200	1.56	0.82	1	3
Sector (SEC)	1 = Service 2 = Non-service (manufacturer and trading)	200	0.52	0.05	0	1
Location (LOC)	1 = town centre 0 = beyond town centre	200	0.58	0.49	0	1

Table 1.
Descriptive statistics

(continued)

Variables	Category	Number	Mean	Std. dev	Min	Max
<i>Symbiotic relationship aspect</i>						
The number of industrial association which firms belong to as members (INDUS_ASSO)	1 = 1 association	200	2.42	1.26	1	4
	2 = 2–3 associations					
	3 = More than 3 associations					
	4 = Not a member of any association					
Connection with banks (CON_BANK)	1 = Having connection 0 = Having no connection	200	0.73	0.44	0	1
Connection with businesses across different industries (CON_DIFF)	1 = Having connection 0 = Having no connection	200	0.77	0.42	0	1
Connections with businesses within the same industry (CON_SAME)	1 = Having connection 0 = Having no connection	200	0.52	0.50	0	1
Frequency of interaction with firms across different industries (FREQ_DIFF)	1 = Never	200	2.25	0.81	1	3
	2 = Occasionally (1–4 times/month)					
	3 = Frequently (more than 4 times/month)					
Frequency of interaction with firms within the same industries (FREQ_SAME)	1 = Never	200	1.84	0.88	1	3
	2 = Occasionally (1–4 times/month)					
	3 = Frequently (more than 4 times/month)					

Table 1.

Regarding the characteristics of business owners in Cambridge, the majority are either younger than 40 years or older than 41–60 years: 44% are male, and 56% are female. In terms of business owner nationality, 85% are local, and 15% are non-local.

Firm attributes show that firm ages are spread over a wide range of operation, from less than one year to more than 20 years. The majority of businesses in Cambridge have been operating for 6–20 years, the majority being small firms hiring 6 to 9 staff. Fifty two percent of firms operate in service sectors and 48% are non-service firms. Also, 58% of MSMEs are located in the town centre and 42% outside the town. This shows the higher numbers of New Zealand MSMEs are urban rather than rural.

Financial performance can be affected by the gender of a company's board of directors (Erhardt *et al.*, 2003) because of the difference in risk assessment behaviours between the genders (Hallahan *et al.*, 2004). This study found that firms operated by males had the highest significant profit percentage, yet also experienced the highest percentage of loss.

Further, the highest significant profit percentages are found in firms operated by local people, while those operated by non-local people had the highest no profit and loss-making percentages.

The highest percentage of profit making gains is found in firms which had operated for more than 20 years. Firms which had operated for less than one year have the highest no profit and loss-making percentages. This is consistent with Mason's (2006) study which notes that 80% of New Zealand firms fail in the first year. Young firms tend to face difficulties in generating positive cash flow due to lack of resources and capital (Thornhill and Ami, 2003) and have problems in accessing capital from the public due to financial instability (Coluzzi *et al.*, 2015), affecting investors' interest in supporting small firms.

Further, the lowest percentage of firms gaining significant net profit is found in the micro-firms, hiring fewer than five employees. These firms had the highest no profit and loss-making percentages. This is consistent with Peacock's study (2000) which reports that small firms experience higher failure rate than large firms. The highest percentage of significant net profit is found in the medium-sized firms hiring 10–19 employees. These firms are in the lowest percentage in experience of loss.

Regarding the main activity of firms, the highest percentage gaining significant profit is found in firms operating in the service sector. However, these firms also experience the highest percentage of loss-making compared to those operating in the non-service segment.

This study uses 200 field samples to specify the variables affecting the relationships between independent variables and the net profit of a firm (Chow, 2006). Table 2 presents all

Variables	Frequency of interaction with businesses from <i>different</i> types of industries			Chi sq. (sig)
	Never (%)	Occasionally (%)	Frequently (%)	
<i>Business owner characteristics</i>				
<i>OWNER_AGE</i>				
Less than 40 (<i>n</i> = 61)	36.10	23.00	41.00	0.1261* (0.0751)
41–60 (<i>n</i> = 94)	16.00	31.90	52.10	
More than 60 (<i>n</i> = 45)	22.20	24.40	53.30	
<i>GENDER</i>				
Male (<i>n</i> = 89)	25.20	24.30	50.50	–0.0048 (0.9460)
Female (<i>n</i> = 111)	21.30	31.50	47.20	
<i>NATION</i>				
NZ (<i>n</i> = 170)	23.50	27.10	49.40	0.0134 (0.8503)
Overseas (<i>n</i> = 30)	23.30	30.00	46.70	
<i>Firm attributes</i>				
<i>FIRM_AGE</i>				
Less than 1 year (<i>n</i> = 9)	33.30	22.20	44.40	0.1199* (0.0909)
1–5 years (<i>n</i> = 30)	30.00	30.00	40.00	
6–10 years (<i>n</i> = 62)	19.40	35.50	45.20	
11–20 years (<i>n</i> = 56)	23.20	30.40	46.40	
More than 20 years (<i>n</i> = 43)	23.00	28.00	49.00	
<i>FIRM_SIZE</i>				
Less than 5 employees (<i>n</i> = 130)	27.70	26.90	45.40	0.1395** (0.0488)
6–9 employees (<i>n</i> = 27)	22.20	29.60	48.10	
10–19 employees (<i>n</i> = 43)	11.60	27.90	60.50	
<i>SECTOR</i>				
Service (<i>n</i> = 105)	20	30.50	48.50	0.0192 (0.7872)
Non-service (<i>n</i> = 95)	26.30	24.20	49.50	
<i>LOC</i>				
Central business district (<i>n</i> = 116)	22.40	29.30	48.30	0.0000 (1.0000)
Non CBD (<i>n</i> = 84)	25.00	25.00	50.00	

Table 2.

Participation response: network intensity among businesses from different industries

Note(s): (i) Robust standard errors in parentheses, and (ii) ****p* < 0.01, ***p* < 0.05, **p* < 0.1

control variables. Business owners less than 40 years in age, exhibit a lower frequency of interaction with business owners from different industries than those in the over 60 years group. Firms operating for more than 20 years reveal the highest percentage of regular associations with other firms across different industries, yet young firms operational for less than one year present the highest percentage of no interaction. Micro-firms reveal the highest percentage of no interaction with other firms across industries.

Different size firms demonstrate differing intensities of association with other businesses across different industries. Inclusion of owner manager's age, firm age and firm size as control variables is consistent with prior research concerning performance of MSMEs (Greve and Salaff, 2003).

3.4 Data analysis technique

This study uses an ordered logistic (Ologit) regression model to investigate possible symbiotic relationships and firm performance. Categorical variables are not suited to ordinary least squares regressions and where variables are dichotomous, Logit regressions are common. Categorical variables with more than two possible values are suited to Ologit regressions (Hauff *et al.*, 2014; Muscettola, 2014). The linear model takes the form:

$$\begin{aligned} \text{PERFORM} = & \beta_1 \text{OWNER_AGE} + \beta_2 \text{GENDER} + \beta_3 \text{NATION} + \beta_4 \text{FIRM_AGE} \\ & + \beta_5 \text{FIRM_SIZE} + \beta_6 \text{SECTOR} + \beta_7 \text{LOC} + \beta_8 \text{CON_BANK} \\ & + \beta_9 \text{CON_SAME} + \beta_{10} \text{CON_DIFF} + \beta_{11} \text{FREQ_SAME} + \beta_{12} \text{FREQ_DIFF} \\ & + \beta_{13} \text{SOCIAL_ABI} + \beta_{14} \text{ATTEND} + \beta_{15} \text{FRANCHISE} + \beta_{16} \text{WOM} + \varepsilon \end{aligned}$$

4. Empirical results

Regression results vary depending on the independent variables selected as input data. Five models with different independent variables were created for running Ologit to identify the association between each variable and the performance of a firm in terms of profit and growth. The aim was to examine whether there were any changes regarding input variables, particularly for those representing symbiotic relationships associated with the performance of firms. Model 1 considers business owner characteristics and firm attributes. Model 2 considers variables relating to symbiotic relationship. Model 3 includes exogenous factors indicating the existence of the bypass and local events. All variables were selected in Model 4, except control variables: age of business owner, age of firm, firm size. Exogenous factors were added in Model 5 to identify changes in other variables.

Estimation of Model 1 shows that firm age and firm size associate with change in net profit. Compared to firms that have been operating for more than 20 years, young firms operating for less than one year are less likely to have higher levels of net profit, while firms operating for 6–10 years are more likely to experience high levels. Compared to medium-sized firms, micro-firms are less likely to increase their net profit. Regarding symbiotic relationship variables, Model 2 indicates that network range is important to firm performance. Importantly, connections with banks or financial institutions, with businesses within the same industry and with businesses across different industries are factors associated with change in net profit. While membership industrial associations did not associate with a change in net profit of firms, the frequency of interaction with business owners operating firms across different industries is associated.

Ologit results show that occasional interactions with owners of heterogeneous firms has a negative impact, decreasing the probability of a higher level of net profit compared to frequent interactors. Social abilities/skills of business owners and workshops/training attendance are negatively associated with change in net profit. When exogenous factors, bypass and events are added in Model 3, findings show that social abilities and workshops/training attendance are not critical to firm performance. However, after controlling for the age of business owner, firm age and firm size in Model 4, the key variables that indicate symbiotic relationships remain the same. Even though the variables indicating the existence of bypass and events were added in Model 5, these two variables do not associate with the change in net profit. Table 3 presents the Ologit results.

Marginal effect informs the opportunity for net profit at each level. This probability can be measured when each independent variable increases from its mean value while other independent variables remain constant.

Table 4 shows that connection with firms across different industries is the most critical factor impacting on changes in net profit. If connections with firms across different industries increase by 1 unit, they are 9.1% less likely to make losses and 6.9% less likely to experience no profit. Connections increase the probability of gaining profit and significant profit by 5.6% and 10.4%, respectively. Frequency of connections with firms operating within the same industry indicate similar associations, yet the probability of decreasing loss and increasing profit are smaller than with connections among heterogeneous firms. Connections with banks and financial institutions also positively associate with change in net profit as these decrease the probability of decreasing loss, yet increase the chance of increasing net profit. However, connections with firms across different industries associate negatively with a firm's profit as infrequent interactions decrease the probability of gaining profit. Operating as a franchisee reduces the chance of experiencing loss by 8.9%, but increases the probability of gaining significant profit by 10.2%.

5. Discussion

The survey of 200 MSMEs indicates that change in net profit is positively associated with variables representing symbiotic relationships. For instance, connections with firms within the same and across different industries. This result is similar to many previous studies that demonstrate the benefits of joining trade associations and professional groups. Few studies, however, have conducted such a comprehensive assessment of key variables, or been able to illustrate the important interplay and interactions between variables.

The study reveals that small business owners attempt to leverage mutual returns from networking, to compensate the opportunity costs incurred by spending time improving internal business management systems. Businesses look for services from social associations capable of responding to individual member's specific needs and demands (Bennett, 2000) as well as membership in those which undertake collective activities on behalf of all members, a feature which reduces free riding. Corporate governance risk tends to be decreased when individuals are politically connected (Dicko, 2017) and internal controls are also beneficial in reducing agency conflict between parties (Agrawal and Knoeber, 1996).

The results show that connections with banks or other financial institutions and connections with businesses across different industries and those operating within the same industry are positively associated with an increased change in profit. Also, interconnections with other entities enables firms to diversify their returns to different market channels. The outcomes of this are clear in firms operated by active investing business owners who seek to improve the corporate performance through merger and acquisition (Bena and Li, 2014). This finding is consistent with Stam *et al.* (2014) study which found that network diversity among small firms had a strong positive relationship with performance.

Model Specification Variable	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Business owner characteristics</i>					
<i>Age</i>					
1. < 20 years old	0.182 (0.381)	0.431 (0.398)	0.266 (0.407)		
2. 21–40 years old	0.132 (0.350)	0.168 (0.363)	0.176 (0.368)		
<i>Gender</i>					
Gender (Male = 1)	0.253 (0.275)	-0.0657 (0.299)	-0.0156 (0.307)	-0.184 (0.288)	-0.177 (0.294)
<i>Nationality</i>					
Nationality (Local = 1)	0.223 (0.394)	0.339 (0.463)	0.230 (0.472)	0.372 (0.443)	0.299 (0.448)
<i>Firm attributes</i>					
<i>Age</i>					
1. ≤ 1 year	-2.540*** (0.723)	-2.596*** (0.785)	-2.787*** (0.782)		
2. 1–5 years	-0.232 (0.475)	0.331 (0.517)	0.279 (0.523)		
3. 6–10 years	-0.889** (0.394)	-0.744* (0.421)	-0.788* (0.425)		
4. 11–20 years	-0.154 (0.382)	-0.0743 (0.424)	-0.0783 (0.427)		
<i>Size</i>					
1. Micro-	-1.599*** (0.368)	-1.282*** (0.395)	-1.379*** (0.398)		
2. Small	-0.789 (0.486)	-0.560 (0.518)	-0.805 (0.530)		
<i>Sector</i>					
Sector (Service = 1)	0.106 (0.292)	-0.00361 (0.325)	0.164 (0.336)	-0.105 (0.310)	-0.0212 (0.317)
<i>Location</i>					
Location (in the city = 1)	0.157 (0.289)	0.216 (0.312)	0.216 (0.311)	0.157 (0.291)	0.129 (0.292)
<i>Symbiotic relationship aspect</i>					
<i>Range of symbiotic relationship</i>					
Connections with bank (Yes = 1)		0.617* (0.363)	0.714* (0.368)	0.741** (0.336)	0.807** (0.340)
Connections with businesses across different industries (Yes = 1)		0.903** (0.396)	0.931** (0.397)	0.831** (0.370)	0.879*** (0.371)
Connections with businesses within the same industry (Yes = 1)		0.693** (0.348)	0.684* (0.358)	0.752** (0.333)	0.775** (0.341)

(continued)

Table 3.
Ordered logistic
results: factors
affecting the change in
net profit of firms

Table 3.

Model Specification Variable	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Number of industrial associations which firms are belong to as members</i>					
1. 1 association		-0.263 (0.398)	-0.252 (0.405)	-0.269 (0.384)	-0.263 (0.390)
2. 2-3 associations		0.267 (0.477)	0.315 (0.484)	0.533 (0.464)	0.573 (0.470)
3. > 3 associations		0.613 (0.496)	0.674 (0.500)	0.659 (0.468)	0.720 (0.473)
<i>Frequency of interaction with business owners operating firms across different industries</i>					
Occasional interaction		-0.808** (0.366)	-0.984*** (0.376)	-0.741** (0.347)	-0.840** (0.355)
<i>Frequency of interaction with business owners operating firms within the same industry</i>					
Occasional interaction		-0.118 (0.411)	-0.107 (0.416)	-0.0867 (0.399)	-0.107 (0.403)
Social ability/skills (Yes = 1)		-0.680* (0.401)	-0.532 (0.415)	-0.341 (0.382)	-0.231 (0.397)
Attendance at workshops/training (Yes = 1)		-0.774** (0.369)	-0.618 (0.382)	-0.706** (0.353)	-0.649* (0.364)
Franchise (Yes = 1)		0.784* (0.413)	0.857** (0.414)	0.818** (0.407)	0.854** (0.406)
Word of mouth (Yes = 1)		-0.106 (0.684)	-0.264 (0.695)	-0.277 (0.657)	-0.427 (0.667)
Information transferal (Yes = 1)		0.362 (0.347)	0.510 (0.355)	0.464 (0.322)	0.538* (0.327)
<i>Exogenous factors</i>					
Existence of the bypass (Yes = 1)			0.698* (0.414)		0.474 (0.384)
Existence of events (Yes = 1)			0.147 (0.445)		0.0515 (0.420)
Constant cut1	-3.131*** (0.715)	-1.820* (1.010)	-1.562 (1.023)	-0.578 (0.794)	-0.362 (0.814)
Constant cut2	-1.770** (0.691)	-0.326 (0.999)	-0.0482 (1.012)	0.778 (0.791)	1.001 (0.812)
Constant cut3	0.758 (0.681)	2.557** (1.018)	2.895*** (1.040)	3.385*** (0.825)	3.643*** (0.852)
LR χ^2	39.83	72.63	78.29	43.58	46.31
Pro > χ^2	0.0001	0.0000	0.0000	0.0004	0.0004
Pseudo R ²	0.0793	0.1445	0.1558	0.0867	0.0921
Observations	200	200	200	200	200
Note(s): Referent group for age of entrepreneur is over 60 years old					
Referent group for firm age is the firms which have been operating for more than 20 years					
Referent group for firm size is medium-sized businesses having 10–19 employees					
Referent group for frequency of interaction with entrepreneurs operating firms across different industries is having frequent interaction					
Referent group for frequency of interaction with entrepreneurs operating firms within the same industry is having frequent interaction					
Referent group for the number of industrial associations is businesses which do not belong to any industrial association as members					
*Significant at 10% level, **Significant at 5% level, ***Significant at 1% level					

Ordered Logit Model 4

Dependent variables	Mean	SD	Make some loss	Make no profit	Gain some profit	Gain significant profit
<i>Change in net profit of firm</i>						
<i>Business owner characteristics</i>						
Gender (Male = 1)	0.445	0.498	0.020	0.015	-0.012	-0.023
Nationality (Local = 1)	0.850	0.358	-0.041	-0.031	0.025	0.046
<i>Firm attributes</i>						
Sector (Service = 1)	0.525	0.501	0.011	0.009	-0.007	-0.013
Location (In the city = 1)	0.580	0.495	-0.017	-0.013	0.011	0.019
<i>Symbiotic relationship variables</i>						
Connections with banks**	0.735	0.442	-0.081	-0.061	0.050	0.092
Connections with firms operating across different industries**	0.77	0.422	-0.091	-0.069	0.056	0.104
Connections with firms operating within the same industries**	0.525	0.501	-0.082	-0.062	0.051	0.094
<i>Number of industrial associations</i>						
1). 1 association	0.360	0.481	0.029	0.022	-0.018	-0.034
2). 2-3 associations	0.165	0.372	-0.058	-0.044	0.036	0.066
3). >3 associations	0.165	0.372	-0.072	-0.055	0.045	0.082
<i>Frequency of interaction with firms operating across different industries</i>						
Occasional interaction**	0.280	0.450	0.081	0.061	-0.050	-0.092
<i>Frequency of interaction with firms operated within the same industries</i>						
Occasional interaction	0.205	0.405	0.009	0.007	-0.006	-0.011
Social ability	0.195	0.397	0.037	0.028	-0.023	-0.042
Attendance at workshops**	0.285	0.453	0.077	0.059	-0.048	-0.088
Franchise**	0.160	0.368	-0.089	-0.068	0.055	0.102
Word of mouth	0.950	0.218	0.030	0.023	-0.019	-0.034
Information transference*	0.430	0.496	-0.051	-0.038	0.031	0.058

Note(s): (i) Robust standard errors in parentheses, and (ii) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4. Marginal effects of independent factors on the change in net profit of firms

The findings of this study also support literature that discusses the financial gains from weak tie relationships, which are the connections with businesses across different industries or with external advisors who work in different areas. It is observed that weak tie relationships are important for new firms which experience financial instability; however, strongly tie relationships with businesses within the same industries or with other entities that already know each other, are valuable for firms which have been operating for a longer period.

Regarding relationships with banks, findings are consistent with reports of the positive impacts of relationships with banks or other financial institutions. Connections with banks increase the level of trust, resulting in lower interest rates and other business support (Uzzi, 1996). Lenders tend to hedge against default risk by offering financial support to high credit trustworthy firms which have good financial health. This financial condition could be detected in the study when lenders or bankers have close connections with business owners. These interactions enable creditors to understand financial decision-making policy and to diagnose financial constraints of the firms. Information about personal details including

credit rating, violations of debt, reduction of dividend and wage payment challenges can signal to lenders financial distress of a firm (Baldwin and Scott, 1983).

Consistent with many studies, the research finds a positive association between operating a business as a franchisee and the performance, since franchisers provide financial support and knowledge to franchisees (Stanworth *et al.*, 1998). Training that is arranged for branches enables knowledge and resources to be transferred between parent companies and subsidiaries and, reduced advertising expenses. Indicative signals from business transactions can benefit both parent firms and subsidiaries by anticipating threats and preparing for uncertain economic conditions.

Ologit results of this study indicate that business owner characteristics and firm attributes are not associated with changes in profit of firms. This is contrary to prior studies which observe that these factors could be associated with firm performance. Firms in the Cambridge area that have operated for under one year are less likely to gain a higher level of net profit, perhaps explained by the many young firms with limited capability to generate cash flow (Thornhill and Ami, 2003). Young firms are less likely to gain benefit from networking than old firms that have stronger financial capability (John, 2007). Close relationships in business networks are valuable to young firms (Hite and Hesterly, 2001) however loose relationships among entities may provide more resources (Burt, 1992). Young risk-taker investors tend to experience higher levels of net profit (Sapienza and Grimm, 1997) and are more active in business creation (Reynolds *et al.*, 2002), partly because of differing financial behaviours of investment in different aged groups of business owners (Cronqvist *et al.*, 2015).

Of note, is that the results of the current study show a negative relationship between the change in net profit and attendance at workshops and training by business owners. This finding is inconsistent with much research which reports on the benefits of attending workshops and training organised by trade associations. The competence of business owners who join networks is increased and the cost of information searching decreases, which adds value to performance (Dyer and Nobeoka (2000) but adverse outcomes may occur because obtaining value from network participation could depend on the individual (Shane and Venkataraman, 2000). Business owners may lose opportunities and time to increase income if they participate in too many workshops. Perhaps these effects are seen because the sample is businesses operating in Cambridge, a small town. In contrast, information transference can be beneficial for entities in larger networks that have formal transmitters and accelerate diffusion of information on corporate policies which become action plans (Daily and Dalton, 1994).

6. Conclusion

A strength of this study over others is that it has collected primary data which attains greater precision to ascertain how a synergistic model might perform. Innovatively, it combines social and business performance indicators to provide more robust results regarding the impacts of symbiosis.

The findings enhance understanding of how business symbiosis may affect business performance. These results are significant in terms of practical guidance for individual businesses and facilitating associations such as the chambers of commerce and policy development for advocacy groups and governmental organisations.

Regarding symbiotic relationships between MSMEs and banks, the findings show that having no connections with banks is positively associated with a reduction in net profit, connections with banks positively relates to an increase in net profit. It was also found that symbiotic relationships among firms are crucial. The study found a positive relationship between a change in net profit and having business connections among MSMEs. This

positive association is also found in MSMEs operated by business owners who have frequent interactions with other business owners.

Regarding business owner characteristics and firm attributes, the findings indicate that there is a significant difference between the age of a business owner and frequency of interaction among firms across different industries. Also, the frequency of interaction among businesses is associated with firm age (the operating years) and firm size (the number of employees). Compared to larger firms, MSMEs try harder to reduce information asymmetry. This goal can be achieved when they connect or network with others.

The findings demonstrate the concept of symbiosis including connections, frequency of interaction, workshops/training attendance and membership in trade/professional associations enable MSMEs to improve profit. The results should encourage MSME owners to abandon the ideas of working alone and adopt the idea of cooperative working where all entities can benefit. Business owners can use sports clubs, trading associations, social meetings and formal networking organisations to build connections and collaborative relationships. In terms of policy implications, the findings of this study could encourage MSMEs, banks, governments and policy-makers to focus on factors that encourage symbiotic behaviours and adopt them to improve profitability of MSMEs. However, they could also consider whether these factors should be examined carefully in advance of generating action plans for both MSMEs and their community.

This fieldwork analysis has some limitations. First, cross sectional data within a shorter period of time may not give a precise picture of symbiotic relationships in network studies (Reese and Aldrich, 1988). Particularly, longitudinal studies could be more appropriate for observing behaviour, actions and reactions when exploring interactions amongst people (Bowen *et al.*, 2010). Second, the results show symbiotic factors associated with the performance of MSMEs. However, how and why networking and connections enable MSMEs to enhance their performance needs further exploration to identify the rationale for connections (Brüderl and Preisendörfer, 1998) and to clarify the mechanisms for construction of symbiotic relationships. Thus using data collected from small samples, and adopting qualitative analysis technique might reveal these linkages in more detail. Third, as unlisted firms are not required to make their financial data public, the definition of business performance presented in this study does not involve sales level, ROE, ROA and survival. Finally, the findings of this study could be affected by the causality issue. Although this situation is normally found in survey research, it leads to difficulty in concluding which situations happens first: symbiotic relationship actions or the changes in firm performance. For example, it might be that MSMEs with increased net profit need to make more connections with banks because of the need for additional financial support.

Future studies could consider these indicators to provide a more extensive picture of corporate performance. A longer period of time and focussing on a small number of samples could collect more in-depth detail about the nature of those networks as well as more opportunity to examine other related variables in regression models.

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