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BUSINESS INCUBATORS: LEVERAGING SKILL UTILIZATION THROUGH SOCIAL CAPITAL

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ABSTRACT

This study examines the role that social capital among tenant companies of a business incubator plays in the acquisition and utilization of business skills by those companies. Social capital is a resource derived from the structure and content of social relations among individuals or groups. Questionnaire data were gathered from 53 managers (primarily owners) of tenant companies in five incubators established by the State Privatization Office of the Turkish Republic. As hypothesized, relational social capital and cognitive social capital each had a significant unique and positive relationship with skill utilization. Contrary to a hypothesis, structural social capital did not have a significant unique relationship with skill utilization. These results indicate that incubator tenant companies' skill utilization is enhanced by social capital generated from the content of relations between the companies such as whether they trust and identify with each other and whether they share a common language and perspective.

Keywords: social capital, business incubation, small business networks

INTRODUCTION

A business incubator is a collective of young companies that nurtures the companies during the early phases of their life by providing them with hands-on management assistance, business and technical support services, shared office space and equipment, access to financing, and opportunities to network both with other new companies within

the incubator and with external parties such as university faculty, industry contacts, and consultants (Bollingtoft & Ulhoi, 2005; Hackett & Dilts, 2004; Peters, Rice, & Sundararajan, 2004). The ultimate objective of an incubator is to increase the likelihood that tenant companies will survive their formative years (Allen & Rahman, 1985). An important way that incubators benefit tenant companies is by offering an institutional and policy framework that supports the acquisition and utilization

of relevant business skills. Incubator tenant companies may have a compelling idea for a unique product or service, but often are deficient in fundamental skills in areas of business development such as human resources, marketing, distribution, assembly, and financial management that are necessary to make their ventures viable (Rice, 2002). Incubators seek both to strengthen the existing skills of tenant companies and to enrich their skill base by facilitating the transfer of relevant information and knowledge to the companies.

The purpose of the study reported here is to examine the role that social capital among incubator tenant companies plays in the acquisition and utilization of skills (hereafter referred to collectively as *skill utilization*) by those companies. Social capital, which is a resource derived from the structure and content of social relations among individuals or groups, has been shown to be an important factor in explaining actors' success in areas such as product innovation (e.g., Cooke, Clifton, & Oleaga, 2005; Subramanian & Youndt, 2005), managerial performance (e.g., Moran, 2005; Wu, 2008), and organizational performance (e.g., Acquah, 2007). Scholars have proposed that social capital fosters an environment that is conducive to the exchange of information and knowledge, such as that pertaining to business skills (e.g., Anderson, 2008; Inkpen & Tsang, 2005; Maurer & Ebers, 2006; Nahapiet & Ghoshal, 1998; Walter, Lechner, & Kellermans, 2007; Yli-Yenko, Autio, & Sapienza, 2001). The current study tested relationships between three separate forms of social capital among incubator tenant companies – structural social capital, relational social capital,

and cognitive social capital – and skill utilization, using questionnaire data gathered from tenant companies of five incubators established by the State Privatization Office of the Turkish Republic. In the context of tenant companies in an incubator, *structural social capital* relates to the overall pattern of social relations among tenant companies; *relational social capital* concerns the affective nature of the social relations among tenant companies; and *cognitive social capital* addresses the extent to which tenant companies share a common language and perspective (Bolino, Turnley, & Bloodgood, 2002; Nahapiet & Ghoshal, 1998).

Our study makes several contributions to the incubator management literature. Based on their comprehensive review of incubator research, Hackett and Dilts (2004) concluded that studies addressing the impact of incubators are scarce and recommended that future research should place greater emphasis on identifying incubator process variables that predict and explain clearly defined incubation outcomes. They also noted a dearth of studies that focus on the incubator tenant company (as compared to, for example, the incubator itself) as the unit of analysis. In response to Hackett and Dilts, our study empirically examines how three incubator process variables related to social capital among incubator tenant companies affect an incubation outcome, or skill utilization, for which the incubator tenant company is the unit of analysis. Skill utilization, which has not been studied in previous empirical incubator research, is a salient incubation outcome because strengthening and enriching the skill base of tenant companies is a primary

role of incubators. Another contribution of our study is that we examine the impact of incubators in a country with an emerging economy, Turkey, whereas previous incubator research has generally been conducted in countries with a developed economy, such as the United States. Phan, Siegel, and Wright (2005, p. 174) recently provided specific support for our focus on incubation process variables related to social capital when, after reviewing the incubator literature, they concluded that future incubator research will increasingly adopt a social network approach as exemplified by the social capital paper by Bollingtoft and Ulhoi (2005).

LITERATURE REVIEW, THEORY, AND HYPOTHESES

Social capital in an incubator is derived both from internal linkages among members of the incubator, which are composed of the tenant companies and professional incubator management, and from external linkages that members of the incubator have with outside parties, such as consultants, financial organizations, universities, and industry contacts (Bollingtoft & Ulhoi, 2003; Buche & Scillitoe, 2007). While all of these linkages can be beneficial to an incubator tenant, the opportunity for close, day-to-day interaction with multiple other tenants in both business and social contexts is particularly important and is a service that tenants would have difficulty obtaining through means other than an incubator (Bollingtoft & Ulhoi, 2005; Lyons, 2002). Adler and Kwon (2002) noted that social capital in a collective is primarily in its internal structure. For these reasons, the current study focuses on internal linkages among tenant companies of the

incubator when addressing social capital.

Information is foremost among the direct benefits that social capital provides to actors involved in social relations (Adler & Kwon, 2002; Subramaniam & Youndt, 2005). The acquisition and exploitation of information are predominately social processes (Yli-Yenko et al., 2001), and social capital can provide actors such as incubator tenant companies with greater access to information and can improve information's reliability, relevance, and timeliness (Adler & Kwon, 2002; Burt, 1997; Smith & Lohrke, 2008; Spence, Schmidpeter, & Habisch, 2003). A particularly salient type of information exchanged among incubator tenant companies pertains to business skills that will enhance the viability of the companies (Bollingtoft & Ulhoi, 2005). Social capital among incubator tenant companies has the potential to increase the companies' skill utilization to the extent that it enhances their access to skill-related information, their expectation that the skill-related information has value, their motivation to exchange skill-related information, and/or their ability to recognize the value of and assimilate skill-related information (Nahapiet & Ghoshal, 1998).

Structural Social Capital and Skill Utilization

Aspects of structural social capital among incubator tenant companies include the extent to which the companies are connected to other tenants, the frequency of the interactions, and the variety of settings (e.g., workplace, social) in which the interactions take place (Bolino et al., 2002; Nahapiet & Ghoshal, 1998).

Structural social capital has the potential to enhance the skill utilization of incubator tenant companies primarily because it increases access to relevant information (Anderson, 2008; Liao & Welsch, 2005; Moran, 2005; Nahapiet & Ghoshal, 1998). For example, as a tenant company forms ties with a larger number of other tenants, a greater amount of skill-related information is available from more disparate sources (McFadyen & Cannella, 2004). More frequent interactions with other tenants across a broader variety of settings will also likely increase access to skill-related information.

H1: *Structural social capital among the tenant companies of an incubator has a positive relationship with skill utilization in those companies after controlling for relational and cognitive social capital among the companies.*

Relational Social Capital and Skill Utilization

Aspects of relational social capital among incubator tenant companies include the degree of trust between tenants and the extent to which the tenants are friendly, identify, and feel a sense of community with one another (Bolino et al., 2002; Inkpen & Tsang, 2005; Liao & Welsch, 2005; Nahapiet & Ghoshal, 1998). One way that relational social capital may increase the skill utilization of incubator tenant companies is by increasing the companies' motivation to exchange skill-related information with one another (Bolino et al., 2002; McFadyen & Cannella, 2004; Nahapiet & Ghoshal, 1998; Smith & Lohrke, 2008). For example, tenant companies are probably more willing to expend the time and

effort to exchange information, particularly sensitive or proprietary information, with companies they feel they can trust and with which they have formed a friendship and sense of community because they will have greater regard for the other companies' welfare and will be less concerned with protecting themselves from opportunism on the part of the other companies (Dyer & Chu, 2003; Inkpen & Tsang, 2005; Moran, 2005; Rowley, Behrens, & Krackhardt, 2000; Wu, 2008). Relational social capital also has the potential to increase incubator tenant companies' skill utilization by enhancing the companies' expectation that the available skill-related information has value (Nahapiet & Ghoshal, 1998). For example, tenant companies are likely to view skill-related information as more reliable, and thus be more likely to use it, if it comes from companies they can trust and with which they identify (Moran, 2005).

H2: *Relational social capital among the tenant companies of an incubator has a positive relationship with skill utilization in those companies after controlling for structural and cognitive social capital among the companies.*

Cognitive Social Capital and Skill Utilization

Aspects of cognitive social capital among incubator tenant companies include the existence of a shared language and vocabulary and the sharing of collective narratives (Bolino et al., 2002; Nahapiet & Ghoshal, 1998). One way that cognitive social capital may increase the skill utilization of tenant companies is by increasing their access to skill-related information. When tenant companies share a common language and

vocabulary, a greater amount of skill-related information becomes available because language is the means by which information is communicated (Nahapiet & Ghoshal, 1998). Recipients who cannot understand the language and vocabulary in which information is communicated may eschew the difficulty and costs necessary to comprehend the information (Reagans & McEvily, 2003). Cognitive social capital also has the potential to increase the skill utilization of incubator tenant companies by enhancing their ability to recognize the value of and assimilate skill-related information. For example, a shared vocabulary and common way of looking at things help companies to make sense of relevant new information regarding skills (De Carolis & Saporito, 2006; Grant, 1996), and narratives in the form of “war” stories can be a powerful means of communicating practical experience in operating a company (Wasko & Faraj, 2005).

H3: *Cognitive social capital among the tenant companies of an incubator has a positive relationship with skill utilization in those companies after controlling for structural and relational social capital among the companies.*

METHOD

Data were gathered with a questionnaire completed by owners or non-owner managers of companies that were tenants of one of five incubators located in five different cities in Turkey. These incubators stemmed from a project launched in 2000 by the State Privatization Office of the Turkish Republic to provide business development support to people who had become unemployed either directly or

indirectly as a result of the state’s privatization initiatives. Most of the incubators are composed primarily of small commercial craft companies, although one incubator houses a significant number of computer software companies.

We sent a packet of questionnaires to the manager of each incubator, who then distributed a questionnaire to each of the incubator’s tenant companies. Respondents, who were promised anonymity, returned their questionnaire in a sealed envelope to the incubator manager, who sent the sealed envelopes back to us.

Measures of Primary Variables

Table 1 presents the items used in the study to measure each of the three forms of social capital among tenant companies (structural social capital, relational social capital, cognitive social capital) and skill utilization. The social capital variables had separate 4-item measures that we developed for this study to address concepts that Nahapiet and Ghoshal (1998) and Bolino et al. (2002) associated with each specific form of social capital. Skill utilization, which addresses the extent to which respondents acquire and use job skills as a result of membership in the incubator, was measured with five items developed by Kiffin-Petersen and Cordery (2003). All items included on the four measures had a 6-point scale with endpoints “Strongly Disagree” (1) and “Strongly Agree” (6). The items for each measure were summed and averaged.

All scale items were translated from English to Turkish when preparing the final questionnaire. To ensure the validity of the translation, the translated

Table 1 – Items Measuring the Three Social Capital Variables and Skill Utilization

A. *Structural Social Capital*

1. I interact with neighboring companies/tenants in the incubator on a frequent basis.
2. I feel very connected to neighboring companies/tenants in the incubator.
3. I often interact with neighboring companies/tenants in the incubator socially outside the workplace.
4. I actively seek to network with neighboring companies/tenants in the incubator at work.

B. *Relational Social Capital*

1. My company and neighboring companies/tenants in the incubator strongly identify with each other.
2. I have a high degree of trust in neighboring companies/tenants in the incubator.
3. I feel a strong sense of community with neighboring companies/tenants in the incubator.
4. I am a friend of neighboring companies/tenants in the incubator.

C. *Cognitive Social Capital*

1. I often share with neighboring companies/tenants in the incubator stories about what goes on at work.
2. Neighboring companies/tenants in the incubator and I share a common language when performing our jobs.
3. I am of similar mind with neighboring companies/tenants in the incubator when it comes to interpreting the events that affect the incubator.
4. I often relive with neighboring companies/tenants in the incubator past events that have occurred at work.

D. *Skill Utilization*

1. I participate in incubator training and development activities/opportunities to learn new skills.
2. I have an opportunity to learn new skills here.
3. I use all of the skills, talents, and abilities I possess on a regular basis here.
4. I apply my skills, knowledge, and abilities to my job in a way I think is best here.
5. I am cross-trained to do other jobs here.

Note. Each item had a 6-point scale with endpoints “Strongly Disagree” (1) and “Strongly Agree” (6).

items were first scrutinized by two business people and an academician who were fluent in English. Then the items were back translated into English by an academician to further ensure that no loss of meaning occurred in the Turkish version of the items.

Control Variables

Four variables were incorporated into the analysis as control variables because of their potential to either inflate or reduce the relationships between the social capital variables and skill utilization. The control variables were gender (male = 1, female = 2), company position (non-owner manager = 1, owner = 2), number of company employees, and a categorical variable indicating the incubator to which the respondent's company belonged (coded 1 – 5).

RESULTS

Respondents

Questionnaires were distributed to a total of 135 tenant companies across the five incubators involved in the study. Although 59 questionnaires were returned to us, 6 that did not provide data for one or more of the questionnaire items of interest were eliminated from the study, resulting in 53 final respondents (a 39% useable response rate).

Most of the respondents retained in the study were male (85%) and were owners of their company (91%). Owners are appropriate respondents for the study because social capital during a start-up company's early development is nearly identical to that of the company's founders (Hite & Hesterly, 2001; Maurer

& Ebers, 2006). The average company had 8 employees.

Descriptive Statistics, Correlations, and Reliabilities

Table 2 presents means, standard deviations, and Pearson bivariate correlations for the eight variables in the study, along with alpha internal reliability coefficients for the multiple-item measures. Among correlations involving control variables, gender had significant ($p < .05$, two-tailed) correlations with all three social capital variables, with women reporting less of each type of social capital than men. These results are consistent with prior research indicating that women have more difficulty accessing networks in organizational settings than do men (Smith, 2000). The social capital variables had significant ($p < .001$, two-tailed) and high (range = .65 to .77) correlations with each other, which is consistent with Nahapiet and Ghoshal's (1998) assertion that the three dimensions of social capital are highly interrelated. Correlations between the social capital variables and skill utilization were significant ($p < .001$, two-tail) and moderate-to-high in magnitude (range = .42 to .65). Alpha coefficients (range = .70 to .83) all met or exceeded the .70 threshold suggested by Nunnally (1978). Alpha, which is the average of all possible split-half reliability coefficients that can be obtained from the set of items comprising a given measure, provides the most thorough analysis of patterns of internal consistency (De Vaus, 2002; Pett, Lackey, & Sullivan, 2003).

Table 2 – Means, Standard Deviations, Correlations, and Reliabilities

Variable	M	SD	1	2	3	4	5	6	7	8
1. Gender	-	-	-							
2. Position	-	-	-.23	-						
3. Firm size	8.02	14.90	.04	-.03	-					
4. Incubator	-	-	-.14	.18	.25	-				
5. Structural social capital	3.93	1.02	-.27*	.09	.09	-.04	(.82)			
6. Relational social capital	4.04	1.07	-.30*	.14	.07	-.13	.77***	(.83)		
7. Cognitive social capital	4.00	0.94	-.30*	.09	.13	-.23	.69***	.65***	(.70)	
8. Skill utilization	4.62	0.82	-.13	.15	.12	-.22	.42***	.58***	.65***	(.77)

Note. Alpha reliability coefficients for multiple-item scales are shown in parentheses on the diagonal. Means and standard deviations are not provided for categorical variables.

* $p < .05$, two-tailed. *** $p < .001$, two-tailed.

Hypothesis Testing

The hypotheses were tested with two-step hierarchical regression analysis, with the control variables and social capital variables as predictors of skill utilization. At step 1, skill utilization was regressed on the four control variables. At step 2, the three social capital variables were added as a block to the regression model. Table 3 displays the results of the hierarchical regression analysis. The beta coefficients, or standardized regression coefficients, represent the strength of the unique relationship between a predictor variable and skill utilization after controlling for

the effects of all the other predictor variables in the regression model. The R^2 statistics represent the amount of variation in skill utilization that is explained by all the predictor variables in the regression model.

Table 3 – Summary of Hierarchical Regression Analysis for Control Variables and Social Capital Variables Predicting Skill Utilization

Predictor variable	β coefficients and R^2 statistics
Step 1: Control variables	
Gender	-.14
Position in company	.19
Number of company employees	.21
Incubator	-.33**
R^2	.14
Step 2: Add social capital variables	
Structural social capital	-.30
Relational social capital	.44*
Cognitive social capital	.57***
Δ in R^2	.38***
R^2	.52***

Note. β coefficients are standardized regression coefficients.

* $p < .05$. ** $p < .01$. *** $p < .001$.

At step 1, the control variables as a group did not explain a significant amount of the variation in skill utilization.

Incubator had a significant ($p < .05$) unique relationship with skill utilization.

At step 2, the addition of the group of social capital variables brought about a significant ($p < .001$) increase in the amount of variation explained in skill utilization beyond that explained by the control variables. Structural social capital did not have a significant unique relationship with skill utilization. This result fails to support H₁, which proposed a positive relationship between structural social capital and skill utilization after controlling for relational and cognitive social capital. Relational social capital had a significant ($p < .05$) and positive unique relationship with skill utilization, which supports H₂.

Cognitive social capital also had a significant ($p < .001$) and positive unique relationship with skill utilization, which supports H₃.

To assess whether multicollinearity was a serious problem in the regression analysis, we examined the variance inflation factors (VIFs) for the seven predictor variables in the full regression model that included both control and social capital variables.

Multicollinearity, which relates to how highly a given predictor variable correlates with the set of other predictor variables in the regression model, increases the standard error of the regression coefficient for the predictor variable and thus makes it less likely the coefficient will be statistically significant (Allen, 1997). All seven VIFs (range = 1.10 to 2.97) were far below the threshold of 10 that is commonly used as evidence of serious multicollinearity (e.g., Cohen, Cohen, West, & Aiken, 2003; Hair,

Anderson, Tatham, & Black, 1992; von Eye & Schuster, 1998).

DISCUSSION AND IMPLICATIONS

Our study contributes to the relatively small body of literature that has examined how incubation process variables affect the outcomes of incubators. From a broad perspective, the results show that social capital derived from relations among incubator tenant companies is associated with greater acquisition and utilization of business skills by those companies. More specifically, the results indicate that tenant companies' skill utilization is enhanced primarily by social capital generated from the content of the relations between companies – Do the companies trust and identify with each other? Do they share a common language and perspective? – rather than from the structure of relations between the companies.

Our results have important implications both for governmental policy makers who authorize the establishment of incubators and for incubator managers, who serve as the governmental units' agents in ensuring that incubators achieve their intended objectives. Traditionally, both of these parties have focused on providing incubator tenant companies with conventional physical (e.g., physical space and equipment) and human (e.g., hands-on management assistance) resources. We provide some of the first direct empirical evidence that social capital among the incubator tenant companies is an important intangible resource that supplements these more conventional resources to benefit the companies in terms of desired outcomes such as skill utilization. Thus our results suggest that governmental policy makers and

incubator managers should actively seek to promote relational and cognitive social capital among incubator tenant companies. Governmental policy makers' efforts will likely take the form of macro-level actions that are incorporated into the legislation to authorize incubators. For example, mandating that a given incubator be composed primarily of companies offering similar types of products or services may enhance the extent to which the entrepreneurs share a common language and vocabulary and thus have access to and can assimilate relevant skill-related information. Incubator managers, who can make specific operating decisions affecting the incubator, likely have a greater ability to influence social capital among tenant companies than do governmental policy makers. Bollingtoft and Ulhoi (2005), who concluded that little is known about the mechanisms that facilitate or hinder internal networking in incubators, provide some preliminary evidence regarding this issue. Their observational study of a Danish incubator suggests that incubator managers can influence social capital by placing tenants' offices in close physical proximity, promoting a common set of values (e.g., cooperation) among current tenants, developing joint activities (e.g., social functions, participation in incubator decision-making, web page construction) to help tenants get to know each other, and controlling the number of tenants in the incubator. Future research should seek to identify other specific ways, many of which likely require few out-of-pocket costs, that incubator management can promote relational and social capital among tenant companies.

We proposed that the relationships that emerged between the social capital variables and skill utilization can be explained in terms of enhanced information exchanged between incubator tenant companies. For example, we theorized that relational social capital increases skill utilization due to greater motivation on the part of tenant companies to exchange skill-related information and to view such information as valuable when they trust and identify with the other tenants. We also theorized that cognitive social capital increases skill utilization due to tenant companies having greater access to skill-related information and a greater ability to assimilate such information when they share a common language and perspective with the other companies. While our explanations for these relationships are based on existing theory from the social capital literature (e.g., Nahapiet & Ghoshal, 1998), we did not measure, and our hypotheses did not explicitly address, variables such as motivation to exchange skill-related information, access to skill-related information, and assimilation of skill-related information. Therefore, we cannot rule out other possible explanations for the relationships that we found. In order to confirm (or disconfirm) the explanations given here, future research should develop and test more complex models that specify variables such as motivation to exchange skill-related information and ability to assimilate such information as intervening on the causal path between social capital and skill utilization.

Our finding that structural social capital among incubator tenant companies was not associated with skill utilization after controlling for relational and cognitive

social capital was unexpected. It seems that simply being connected with other tenant companies is not sufficient to enhance a company's skill utilization when those relations are not characterized by trust, a sense of community, and a common language and perspective. While a greater number of connections likely increases the potential amount of skill-related information that is available to tenant companies, whether the companies actually share such information with one another and ultimately perceive the information as valuable and assimilate it may hinge on the content of the connections. Developing and maintaining a network of social relations with other incubator tenants is costly to entrepreneurs in terms of time invested in, for example, social activities and small talk that are diversions from activities that are more directly related to operating their business (Bollingtoft & Ulhoi, 2005; Nahapiet & Ghoshal, 1998). Our results suggest that a cost-effective strategy for entrepreneurs who seek to bolster the positive effects of social capital on skill utilization may be to focus primarily on enhancing the quality, rather than the quantity, of their social connections with other tenant companies in the incubator.

The current study introduces skill utilization of tenant companies as an incubation outcome that has both academic and practical significance. An important issue is the extent to which skill utilization enhances a tenant company's chance of survival, which is the ultimate outcome of interest. In the future, researchers might develop and test models that link the various forms of social capital (including structural social capital) among tenant companies to the companies' survival by way of

social capital's effects on skill utilization, as well as via other causal paths suggested by the literature. While our current results indicate that structural social capital does not enhance skill utilization, it may still influence the survival of tenant firms through other processes that do not involve skill utilization.

Our focus in the current study was on the effects of social capital derived from relations among incubator tenant companies. However, tenant companies will likely also benefit from social capital that arises from their connections with incubator management as well as from their connections with external parties such as university faculty, consultants, and industry contacts. Work is needed to assess the differential contribution that social capital from each of these three sources makes to skill utilization and other outcomes of incubator tenant companies, such as their long-run survival. An interesting variation on this work would be to instead examine how incubator management and parties external to the incubator benefit from their social relations with incubator tenant companies. For example, university faculty members may, as a result of social interaction with entrepreneurs in an incubator, obtain knowledge that enhances their teaching and research endeavors.

Care should be taken in generalizing the results of the current study beyond its sample of tenant companies in incubators established by the State Privatization Office of the Turkish Republic. Factors specific to these companies may have had an impact on the results. For example, all the incubators in the study have a similar governance structure and similar political, economic, and social

objectives. All, or virtually all, of the respondents to our questionnaire were raised in Turkey and speak Turkish as their primary language. Future studies should test whether the relationships we reported between the social capital variables and skill utilization also apply to respondents whose companies are located in other incubators and/or who are natives of countries other than Turkey. Data from this proposed research could also be used to better assess the measurement properties of the new structural, relational, and cognitive social capital scales that we developed for the current study. The possibility exists that these scales do not adequately measure their related concepts. For example, some scale items may have a strong association with more than one social capital variable, which would undermine the extent to which the scales measure three separate and distinct concepts.

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