Antecedents of Innovativeness: Entrepreneurial Team Characteristics and Networking

Dilek Turan[1], Semra F. Aşçıgil[2]
1Faculty of Economics and Administrative Sciences, Middle East Technical University, Department of Business Administration, Ankara, Turkey
dilek_tuten@hotmail.com
[2]Faculty of Economics and Administrative Sciences, Middle East Technical University, Department of Business Administration, Ankara, Turkey
sascigil@metu.edu.tr

Abstract. This paper highlights the impact of entrepreneurial team demographics and networking on organizational innovativeness in a sample of SMEs located in northwest Turkey. The findings revealed that entrepreneurial team characteristics (age heterogeneity and average education) played a significant role in organizational innovativeness of SMEs after controlling team size. Networking with public organizations played an important role in contributing to innovativeness capacity whereas networking with competitors had a marginal role. The findings suggest substitutability between entrepreneurial team characteristics (average education) and networking which can offer more flexibility in the policies of public organizations and educational institutions.

Keywords: Networks, Entrepreneurial Teams, Innovativeness, Small and Medium-sized Enterprises

1 Introduction

Mortality of SMEs is argued to be quite low and research concludes that survival can be achieved through acquiring a propensity to create (Desphande and Farley; 1999, 2000). Innovation process involves exploiting an opportunity through which entrepreneurs combine resources in a novel way that would enable them to survive. Organizational innovativeness is a means for change (Damanpour, 1991), yet differs from change with an intentionality of direct benefit and newness (West and Farr, 1990). Although research on innovativeness produced numerous findings, the results were inconsistent (Downs and Mohr, 1976) as each focused on different aspects of innovativeness (Varis and Littunen, 2010). The variety in approaches prevented cumulative contributions to the concept. Past research mostly focused on product innovativeness (Griffin, 2002) neglecting the importance of other dimensions such as market and process that contribute to overall innovativeness of organizations.

Entrepreneurs utilize both tangible and intangible resources they possess in order to enhance innovativeness. It is argued that small firms' ability to use external networks (Noteboom, 1994) help to remedy the shortcomings of smallness (Hakansson and Snehota, 1990) in identifying innovative opportunities. Networks bring new knowledge and information that is vital for firm innovativeness (Bell, 2005). Moreover, entrepreneurial team characteristics are yet another factor whose direct impact on strategic issues such as innovativeness has been demonstrated by the work of Wiersema and Bantel (1992). However, past researchers have either studied relationship of human or social factors and innovativeness, taking samples of entrepreneurs rather than entrepreneurial teams (Seghers et al., 2012), or explored the

ISSN 2183-0606
http://www.open-jim.org

effect of only one of the above mentioned variables (networks and entrepreneurial teams) on innovativeness (Molina-Moralez and Martinez-Fernandez, 2010).

The purpose of this paper is to clarify whether networking and entrepreneurial team characteristics are antecedents of organizational innovativeness. Organizations' overall innovativeness capability will be the basis of our understanding in operationalizing the construct. The paper is organized as follows. First, a review of the literature on the concepts of innovativeness, entrepreneurial teams and networking is provided. Second, the findings on the relationship between innovativeness and the two independent variables (entrepreneurial team characteristics and networking) are reviewed in order to develop and justify the hypotheses. Third, the methodological background and research findings are introduced. Last, the discussion and limitations of the research are presented.

2 Innovativeness, entrepreneurial teams, and networking

Wang and Ahmed (2004) defined an organization's overall innovativeness construct as "introducing new products to the market, through combining strategic orientation with innovative behavior and process." According to the authors innovativeness implies the propensity for constant innovation. The five interlinked areas they identified are product innovativeness, market innovativeness, process innovativeness, behavioral innovativeness and strategic innovativeness. Product and market innovativeness are externally focused and market based, while process and behavior innovativeness are internally focused. Strategic innovativeness, on the other hand, emphasizes an organization's ability to detect external opportunities in a timely fashion and match external opportunities with internal capabilities in order to serve innovative products and explore new markets or market sectors. These five aspects together represent an organization's overall innovativeness (Wang and Ahmed, 2004).

Organizations vary widely with regard to their capacities to innovate (Cohen and Levinthal, 1990). The resource dependency theory of organizations emphasizes the importance of both internal and external resources in company performance in capturing a mode of innovativeness (Varis and Litunen, 2010; Barney, 2001; Peteraf, 1993). Although past research focused on the entrepreneur as a person in developing processes (North and Smallbone, 2000), recent literature emphasizes the importance of entrepreneurial teams whose trait combinations/characteristics are major assets for innovativeness (Carpenter, 2002) and family firm performance (Ling and Kellermanns, 2010). The concept of entrepreneurial teams has been built on top management teams research (Hambrick and Mason, 1984). Üçbaşaran et al. (2003) defined entrepreneurial teams as comprising members who hold significant ownership stakes and are involved in strategic planning. Research has shown the superior performance of ventures owned by entrepreneurial teams relative to those owned by solo entrepreneurs (Cooper and Bruno, 1977). Top management teams' involvement becomes more intense in small businesses as a consequence of their size and flexible structure (Brunning et al., 2007). Therefore, the capacity created by diverse entrepreneurial teams attains particular importance in developing innovation strategies and acknowledging their knowledge and experiences inducing use of resources in a unique way.

Upper echelons theory, which pioneered interest in teams at the top, indicates that the demographic characteristics of top executives are related to major organizational outcomes (Cannella et al., 2001). The larger the combined set of skills and experiences, the more successful they are in addressing complex issues such as innovativeness. Similarly, heterogeneity begets dynamism that helps in accessing networks to find creative solutions to pressing problems (Carpenter et al., 2004).

Heterogeneity may be due to different sources and literature distinguishes between job-related (factors such as background, education, and tenure which capture task relevant skills and experiences) and non-job related (age and gender) heterogeneity. Research identifies job-related heterogeneity as provoking more salient outcomes in strategic dynamism than the latter (Naranjo-Gil et al., 2012). However, heterogeneity is a double edged sword as negative effect of team heterogeneity was also identified on exchange of information as well as integration of differential knowledge within top management teams (Li, 2012).

While internal resources such as entrepreneurial team characteristics are critical to innovativeness, connections with external knowledge sources complement the resources that small businesses are deprived of. Hence, top management team characteristics alone may not be enough to predict organizational outcomes and consideration of other predictor variables such as networking may lead to more value-adding contributions in research (Carpenter, 2002). Networks are valuable for bringing innovation-specific resources and expertise for entrepreneurial teams to exploit (Rothwell, 1991; Zaheer and Bell, 2005). Firms' desire to obtain needed information (Hendry et al., 1995) and knowledge opportunities (Brunetto and Far-Wharton, 2007) have been cited among primary justifications for networking.

Evidence as to the importance of networking has been provided by different theories. Organizational learning theory explains innovativeness capacity through an inherent learning process. Small businesses exchange resources and information with external resources to incorporate skills, knowledge and behaviours into their existing sets of skills. Throughout exchange processes, learning needs of entrepreneurial teams are met by means of various external relationships that advance innovativeness capacity of the entrepreneurial team. Social capital theory yet brings another perspective that highlights the importance of social networks. By creating a context for social interactions, social capital facilitates the formation of new linkages (Tsai, 2000; Spence et al., 2003) that boost innovativeness.

Social capital is a relational source featured in exchange relations that enhance the level of knowledge through impacting quality of information, frequency of interaction and the degree of trust in these relations (Nahapiet and Ghoshal, 1998; Greve and Salaff, 2003). Complementing their own resources, small businesses build networks to exchange resources (Massa and Tessa, 2008). Based on the quality of exchange relations, the information accessed by the entrepreneur earns usefulness as well as reliability. Networks developed with various stakeholders are instrumental for providing information and knowledge. Stakeholders such as government agencies, universities, suppliers and competitors are critical in their influence on innovativeness (Gibb, 1995; Greve and Salaff, 2003). However, the impact created varies depending on the type and nature of linkages. Vertical linkages such as suppliers and customers influence cost reduction, risk-sharing opportunities and timeliness. Horizontal linkages such as competitors, universities, and public agencies, on the other hand, complement know-how (Tidd et al., 1997; Massa and Tessa, 2008).

According to Jack (2005), entrepreneurs' aim in developing ties is not restricted by overcoming weaknesses due to newness. Besides, networks are tools to acquire social capital, which is essential for innovativeness. However, it should also be acknowledged that how networks are utilized is of greater critical importance than merely having networks (Jack, 2005). Using weak and strong ties concepts, Jack (2005) admitted that strong ties developed with stakeholders were important in providing information and knowledge for innovation, as well as enhancing the business and personal reputation (Jack, 2005). Elfring and Hulsink (2007) also used strong and weak ties concepts in a case study where different patterns of network development were identified. Networks display a dynamic nature where weak ties are abandoned more often than strong ones. Moreover, networks are sought to gain

information as well as legitimacy. Legitimacy equips the founders with network development capabilities. But at the same time, limitations are signified whereby network overload hinders utilization (Elfring and Hulsink, 2007).

In their research focusing on the effect of interorganizational social capital on start-up firms, Pirolo and Presutti (2010) showed that both strong and weak social capital affect the growth of start-up firms throughout their life cycle. Moreover, they verified that weak ties with customers influence innovation performance growth, while strong ties, which form a significant social liability, have an inhibiting effect during their entire life cycle. In all this research (Jack, 2005; Elfring and Hulsink, 2007; Pirolo and Presutti, 2010) a consensus over the dark side of the networks was reached in that having too many strong ties may inhibit access to new information.

On the other hand, Ahuja (2000) distinguished among technical, commercial and social capital in terms of influencing the linkage formation behavior. In his study of chemical firms focusing only on interfirm networks, he argued that ability to collaborate with other firms was to a great extent influenced by the commercial capital (supporting assets needed in commercializing an innovation) and therefore not evenly distributed across firms. However, firms with technical capital (capabilities in creating new technology, products, and processes) could still develop alternative paths for collaboration with other firms, such as joint ventures or technology agreements. Social capital, on the other hand, plays a facilitative role by providing both informational and reputational benefits to collaborating firms. Through social capital development, firms engage in joint ventures more confidently as it allows the gaining of prior insight as to the predictability of behaviours of other firms (Dakhli and De Clercq, 2004).

3 Development of hypotheses

3.1 Entrepreneurial team demographics and innovativeness

Since SMEs lack most of the resources large firms have for use in innovative activities, what individuals know becomes extremely important (Wicklund and Shephard, 2003). Although there is substantive research in large firms pertaining to the role played by top management team characteristics in enhancing innovativeness (Wiersema and Bantel, 1992; Canella et al., 2001; Camelo-Ordaz et al., 2005), little is done to address whether this is equally important in SMEs. Because of liability of smallness being the major constraint, the entrepreneurial human capital emerges as a critical factor to exploit (Davidsson and Honig, 2003; Shrader and Siegel, 2007). Below are the salient entrepreneurial team demographics and the crucial role they play in determining innovative capacity as discussed in the literature.

Gender Heterogeneity: As a demographic variable, gender has drawn the attention of many researchers upon increasing number of women entering business life. Gender heterogeneity was found to be associated with higher quality solutions (Hoffman and Maier, 1961; Sethi et al., 2002), creative decisions (Zaidi et al., 2010) and better performance (Wood, 1987). Gender diversity has a positive impact on innovativeness because of the differences in the nature of women and men that in turn enhance team performance in innovative activities. Thus, we propose:

> *Hypothesis 1: There is a positive relationship between gender heterogeneity of entrepreneurial teams and innovativeness.*

Average Age: As was found by many researchers, management team youth affects innovative activities of the companies positively (Child, 1974; Hambrick and Mason, 1984; Bantel and Jackson, 1989). Three explanations for this association can be seen in the literature. First, as Child (1974) contended, younger managers possess the

ability to spend more physical and mental effort to bring change to their companies. Moreover, their learning abilities, reasoning and memory are better than older managers which help them to come up with new ideas and learn new behaviors (Botwinick, 1977; Burke and Leah, 1981). Second, an advantage is created in terms of the more sophisticated technical knowledge acquired by younger managers during their education (Bantel and Jackson, 1989). Finally, younger managers are more eager to take risky actions than older managers (Vroom and Pahl, 1971; Hambrick and Mason, 1984).

In contrast, it is argued that older managers avoid risky behaviors to maintain their financial and career security since their expenditure habits are already established (Carlsson and Karlsson, 1970). Old age employees are less creative and slow in adapting to change (Taqi, 2002). Moreover, youthfulness also poses limitations on innovativeness. According to Kitchell (1997), very young managers searching for opportunities at early stages of their career may fail to make a long-term commitment or champion radical changes. Taking the opposite arguments into account, it can be deducted that the relationship between an entrepreneurial team's average age and innovativeness, while negative, is curvilinear at the extremes (for very young and very old entrepreneurial teams). Since the findings indicate a potential curvilinear relationship beyond a simple linear relationship, we propose:

> *Hypothesis 2: There is a negative curvilinear relationship between average age of entrepreneurial teams and innovativeness.*

Age Heterogeneity: Contradictory views are found on the effect of age heterogeneity on innovativeness by researchers. Age heterogeneity increases the innovativeness of teams because different age groups have different attitudes, values and perspectives due to their experiences of different social, political and economic environments and events which boost group creativity (Leonard and Sensiper, 1998; Glass, 2007). However, heterogeneity is avoided since it inflates negativity and leads to higher levels of conflict (Hartel, 2004). Conflict obstructs group cohesiveness which is necessary for teams to decide on strategic actions like innovations. On the other hand, Bantel and Jackson (1989) in their research in the banking sector found no significant relationship between the two variables. Hence we propose:

> *Hypothesis 3: Innovativeness of entrepreneurial teams is influenced by their age heterogeneity.*

Average Organizational Tenure: Hayes and Abernathy (1980) stated that a manager working in a particular company for long periof of time can develop knowledge of the technological trends unique to the industry which in turn encourages him to engage in innovation capitalizing on such knowledge. On the other hand, Hambrick and Mason (1984) proposed that managers who have worked in the same company for many years develop a kind of loyalty to their existing products and markets which prevents them from looking for new ones. Similarly, Bantel and Jackson (1989) pointed to managers' psychological commitment to the status quo - a factor decreasing the need for information search. Similarly, Brunning et al. (2007) claimed that over time, managers may become insulated from changes in business environment and inevitably fail to perceive and react to change. Thus, considering these arguments, a negative curvilinear relationship is proposed:

> *Hypothesis 4: There is a negative curvilinear relationship between average tenure of entrepreneurial teams and innovativeness.*

Organizational Tenure Heterogeneity: As in the case of age heterogeneity, cohort groups defined by organizational tenure are likely to be different from each other with respect to their experiences, perspectives, attitudes and values. Although heterogeneity may add cognitive diversity and encourage discussion, these differences may at the same time promote conflict and obstruct communication processes among

members creating a barrier for innovativeness (Katz, 1982; Bantel and Jackson, 1989). Therefore, we propose:

Hypothesis 5: Innovativeness of entrepreneurial teams is influenced by their tenure heterogeneity.

Average Education Level: A manager's formal educational background has been accepted as a sign of his/her values and cognitive abilities in many studies. Moreover, a positive relationship with top management teams' average education levels and their commitment to innovation was found (Kimberly and Evanisko, 1981; Hambrick and Mason, 1984; Bantel and Jackson, 1989; Daellanbach et al., 1999) which indicated that teams having higher education levels had an ability to bring creative solutions to more complex problems, and were more receptive toward innovation. Therefore, we propose:

Hypothesis 6: There is a positive relationship between average education level of entrepreneurial teams and innovativeness.

3.2 Networking and innovativeness

Networking with Customers: It has been argued that there is scope for considerable gain through involving the user in the product design and development processes (Rothwell and Gardiner, 1985; Thomke and Von Hippel, 2001; Prahalad and Ramaswamy, 2004). These gains are believed to be four-fold. First, internal design and development activities may be supplemented by getting access to the technical and managerial skills of their customers. Second, user involvement is an ideal way of establishing the optimum price/performance combination and ultimately the optimum specifications. Third, involving the user in the product design and development stages reduces the post-delivery learning required on their part. Finally, where user involvement stimulates a strong relationship, this may result in user feedback and associated product improvements that serve to lengthen the product life span (Rothwell and Gardiner, 1985; Freel, 2000). Von Hippel and Katz (2002) claimed that agency costs will be incurred whenever users delegate design to manufacturers and thus, underlined the importance of providing users with the incentives for participating in innovation. In support of these views, Freel (2003) later found a significant positive relationship between having links with customers and new product innovations. Therefore, we propose:

Hypothesis 7a: There is a positive relationship between networking with customers and innovativeness.

Networking with Suppliers: Networking with suppliers enhances competitiveness (Ramcharran, 2001) with an ultimate effect on innovativeness capability (Rothwell and Dodgson, 1991). Since bought-out items account for a significant percent of total costs (Turnbull et al., 1992) in many industries, it is evident that the supplier relationship has an important role in determining competitiveness and ultimately, innovative capability. In their review, Rothwell and Dodgson (1991) found that in cases of significant innovation, 10 percent of innovations involved collaboration with customers only, compared to 55 percent that involved collaboration with both customers and suppliers. Exploring the degree of linkages between automotive parts suppliers and automobile manufacturers, Ramcharran (2001) also found significant linkages manifested by high correlation coefficients of the price-to-earnings ratio of auto parts suppliers and auto manufacturers. Based on these findings, it can be concluded that networking with suppliers benefits firms' innovativeness. Therefore, the following hypothesis is proposed:

Hypothesis 7b: There is a positive relationship between networking with suppliers and innovativeness.

Networking with Competitors: When trying to innovate, an important strategic failure that occurs is exploiting current competencies to provide short-term success, while suppressing the detection of new competencies and creating obstacles to the firm's long term viability (Levinthal and March, 1993). Many firms appear to exploit existing competencies and explore new competencies at the same time (O'Reilly and Tushman, 2004). According to Millson et al. (1996), formal and informal partnering arrangements done with other firms may help to overcome the limitations of internal resources on innovativeness. Other studies suggest that the principal benefits of networking with competitors include complementing and supplementing internal product development efforts (Rothwell and Dodgson, 1991), cost and risk sharing (Dodgson, 1994), accessing new markets and the transfer of both embedded technology and tacit knowledge (Karlsson and Olsson, 1998). Strategic alliances provide a platform for organizational learning whereby partnering firms gain access to new knowledge. In fact, managing the relationship itself is a learning process (Inkpen and Tsang, 2005; Kale and Singh, 2007; Su et al., 2009).

Despite the various advantages, concerns over intellectual property may impede firms' willingness to enter into such horizontal collaborative agreements. However, Freel (2000) argued that the most innovative firms were significantly more likely to be involved in some form of innovation-related collaborative activity with firms outside the vertical value chain. Although competitors are the most neglected stakeholders, collaboration with them revealed positive effect on innovativeness, particularly in research done in the biotechnology industry (Walker et al., 1997; Baum et al., 2000; Su et al., 2009). To this end, co-opetition strategies need to be deployed to change the perception of business from being one of win-lose to win-win (Nalebuff and Brandenburger, 1997). Therefore, we propose:

> *Hypothesis 7c: There is a positive relationship between networking with competitors and innovativeness.*

Networking with Universities: The collaboration with universities and research institutes enables small firms to develop technological knowledge which can't be accomplished alone (Bower, 1993). As in other types of external linkages, small firms are able to gain access to complicated technology and technical expertise whose direct employment is impeded by internal resource limitations (Freel, 2000). As a matter of fact, partnership with industry is on the agenda of many universities as a part of national policies to strengthen innovativeness. Consultancy provided to ventures as well as continuing education offered to professional employees by academicians (Reams, 1986; Saxenian, 1994) are examples illustrating the contributory potential of such networks. In this regard, two principal explanations are referred to. The first claims that university research is a source of significant innovation-generating knowledge which diffuses initially through personal contacts to adjacent firms (Acs et al., 1994). The second suggests that small firms are able to fill internal resource deficiencies by reaching university resource networks (Westhead and Storey, 1995).

Empirical support to the above theoretical explanations was offered by Wilkinson et al. (1996) who found in their study that 90 percent of the most innovative firms had formal links with universities. Freel (2003) also found a significant positive relationship between having university links and introducing new processes in a sample of 597 small and medium sized enterprises. Therefore, we propose:

> *Hypothesis 7d: There is a positive relationship between networking with universities and innovativeness.*

Networking with Public Agencies: The role played by public organizations in innovation has been explored by various researchers (Chung, 1999; Hassink, 2002; Heimonen, 2012). Among the valuable outcomes of networking with public organizations, specialist advice and information provided by public organizations are

crucial. Moreover, government employs the requisite expertise or has easy access to such expertise through its considerable resource networks. Alternatively, government fulfills the network management role in these collaborations. Empirically, Freel (2003) discovered the positive effect of having public sector links on product innovations. Since the regulatory environment of the public sector has an impact on small business growth and development, collaboration with public organizations has a positive effect on innovations (Freel, 2003) and breeds the skills, attitudes and values of entrepreneurs (Gibb, 1995) who need to be more innovative. Thus, we propose:

> *Hypothesis 7e: There is a positive relationship between networking with public agencies and innovativeness.*

To sum up:

> *Hypothesis 7: Networking with stakeholders such as customers, universities, suppliers, public organizations and competitors have positive relations with innovativeness.*

4 Research methodology and findings

4.1 The sample

The study was conducted in the largest Organized Industrial Site of Bursa, Turkey. The district only refers to geographical proximity of SMEs from different sectors without any support of a dedicated institution. Although the industrial site is one of the major sites in Turkey, it may not represent the whole country. Therefore, the findings are specific to the industrial site studied. SMEs comprise 99.5 percent of the total number of firms in Turkey (SIS, 2002) and are defined as the economic units having less than 250 employees and less than 25 million liras in net annual sales. Based on this definition, a total of 136 companies were identified utilizing regional websites listing SMEs and company websites. Out of 136 companies contacted, 119 agreed to participate. Out of 77 returned surveys, 74 usable (response rate = 62.18%) remained after eliminating those without entrepreneurial teams or those with missing responses.

The industries represented by SMEs in the sample are; textile (20.3%), automotive (28.4%), chemical (10.8%), information technologies (8.1%), metal/rubber/packaging (8.1%) and others (24.3%). The average age of SMEs is 18 years with a median of 14.5 years. In terms of status, 12.2% of these firms are sole proprietorships, 1.4% are open partnership, 28.4% are incorporated companies and 58.1% are limited companies.

The data is based on self-reports of either general managers or owners. Self-report surveys are indicated as the most commonly used method in studying innovation (Sonnfield et al., 2001). The single respondent approach adopted is based on the assumption that the respondents would be familiar with the information sought. Hence, it is argued that in the case of SMEs, the views of a single respondent may, in fact, reflect those of the firm (Lyon et al., 2000).

4.2 Measures of variables

The innovativeness scale used was developed by Wang and Ahmed (2004). The scale contained product, market, process, behavioral and strategic innovativeness dimensions, which as a whole measures organizational innovativeness. The instrument originally contained 20 items. However, the item "we get a lot of support from managers if we want to try new ways of doing things" was eliminated since it was not appropriate for the purpose of the research. Exemplar scale items are "In new

product and service introductions, our company is often first-to-market," "New products and services in our company often take us up against new competitors" and "We are constantly improving our business processes." Each item had a 6-point scale with the endpoints "Strongly Disagree" (= 1) and "Strongly Agree" (= 6).

The networking scale was developed by Freel (2003). A six-point Likert scale (1= strongly disagree, 2=disagree, 3= slightly disagree, 4= slightly agree, 5= agree and 6= strongly agree) was used to assess responses to the items. Networking activities were measured by asking five separate questions (Freel, 2003). An exemplar item is "Has your firm been involved in networking with customers for innovative activities during the past 3 years?" Networking with customers, suppliers, competitors, universities and public agencies for innovation-related activities were determined by forming dummy variables. Those who networked with a party for innovation related activities during the past three years were coded as "one" and coded as "zero" if otherwise.

The entrepreneurial team data was collected by asking the number of people in the founding team and the current team, followed by information on the current entrepreneurial team size. Subsequently; gender, current age, education level attained, occupation, tenure in the company and total tenure were asked. For education, six response categories were provided; i.e. elementary school (eight years), high school (11 years), two-year graduate program degree (13 years), college degree (16 years), masters' degree (18 years) and doctoral degree (22 years), and these categories were converted into continuous variables.

Team variables that were used in the analyses such as average age, average organizational tenure and average number of years of education were calculated by summing the members' values and dividing it by the number of members in the teams. For team heterogeneity variables, two different approaches were utilized. For interval data, Allison (1978) observed that the coefficient of variation provides a direct method for obtaining a scale invariant measure of dispersion. In our study, this was appropriate for interval level variables with a theoretically fixed zero point and was used for age and organizational tenure. For the categorical variable such as gender, Blau's (1977) index of heterogeneity:

$$(1- \Sigma p_i^2)$$

In the heterogeneity index, p is the proportion of group members in a category and i is the number of different categories represented in the team. Permissions from the authors of original scales and questionnaires were obtained prior to circulation. First, the questions and scales used in the questionnaire were all translated from English to Turkish. Subsequently, three managers working in the industry and an academician reviewed the translations to assure that no loss of meaning occurred.

Control Variable: Team size is seen as a factor in organizational demography theory which may affect group composition and as a result the organizational outcomes (Blau, 1977; Eisenhardt and Schhonhoven, 1990; Ancona and Caldwell, 1992). Since larger teams are likely to be more heterogeneous, they affect the coefficient of variation. Larger size also enhances cognitive diversity which enriches insights during strategy making (Bantel and Jackson, 1989; Brunning et al., 2007). Therefore, it is likely that team size is positively correlated with team heterogeneity which in turn affects innovativeness of the teams. According to Bantel and Jackson (1989), positive correlation is especially likely to exist when the teams of interest are all relatively small. Therefore, team size has been regarded as a control variable in this study.

4.3 Descriptive statistics

Of the participant firms, 20.3 percent were operating in the textile sector, 28.4 percent

were in the automotive sector, 10.8 percent were in the chemical groups sector, 8.1 percent were in information technologies sector, 8.1 percent were in the metal/rubber/packaging sector and 24.3 percent were in other businesses such as construction, printing, heating-cooling systems, logistics and consultancy. The average age of the companies was 18 years with a median of 14.5 years. 73.3 percent of the companies have employee numbers less than 50.

The entrepreneurial teams differed with regard to team formation modes. 54.1 percent were formed drawing from family members and friends. 24.3 percent of the teams utilized their professional ties prior to the firm's foundation. Only 4.1 percent of the teams were formed under the lead of an investor. These results showed that SMEs in the sample chose their entrepreneurial team members from among those with whom they have emotional kinship rather than preferring those with whom they had professional relations as was found in Westhead et al.'s (2001) study.

The entrepreneurial teams' sizes ranged from two to twelve members, with the average size being 4.04 (SD= 2.49). In total, there were 299 members in 74 teams. The majority of the 290 team members were male (male=74.8%; female=25.2%) indicating male domination. The team members were on average middle-aged (average=43.86, SD= 7.62) and had been employed by their current firms for 11.2 years on average (SD=6.73) with an average of 18.7 years of work experience (SD= 7.90). Respondents represented different functional areas such as operations/production, management, marketing/sales, finance/accounting and R&D. Educational levels attained also considerably varied; elementary school (15.2%), high school (25.9%), two-year degree (10%), college degree (37.2%), master's degree (10%) and doctoral degree (1.7%). Concerning college degree attainment, 41 percent studied technical areas (engineering or science) whereas 59% had education in non-technical fields (general business, finance/accounting, marketing/sales or law) (Table 1).

Table 1. Descriptive Statistics.

Variable	Frequency	%
Gender (N=290)		
Male	217	74.8
Female	73	25.2
Age (N=272)		
20-30	36	13.2
31-40	88	32.4
41-50	79	29.0
Above 51	69	25.4
	Mean= 43.86	**SD= 7.62**
Education (N=290)		
Elementary school	44	15.2
High school	75	25.9
Two-year degree	29	10.0
College degree	108	37.2
Master's degree	29	10.0
Doctoral degree	5	1.7
Tenure in the Company (N= 267)		
0-1 year	14	5.2
2-5 years	71	26.6
6-10 years	78	29.2
11-15 years	39	14.6

16-20 years	21	7.9
More than 21	44	16.5
	Mean=11.17	**SD= 6.73**
Tenure in General (N=248)		
0-1 year	5	2
2-5 years	19	7.7
6-10 years	46	18.5
11-15 years	43	17.3
16-20 years	37	14.9
More than 21	98	39.5
	Mean= 18.68	**SD= 7.90**

Most of the firms built networks with their customers (78.4%) and suppliers (77%), whereas networking with competitors (24.3%), universities (21.6%) and public organizations (36.5%) were relatively less frequently utilized. The means, standard deviations, reliability coefficients and inter-correlations are presented for all variables in Table 2.

4.4 Correlation analysis

Table 2 presents means, standard deviations and Pearson bivariate correlations for the twelve variables in the study, along with alpha internal reliability coefficients for multiple-item scales. The Cronbach's Alpha found for the innovativeness scale (α =0.895) exceeds the threshold of .70 suggested by Nunnally (1978). The correlation coefficients ranged between 0.012 and 0.572 (Table 2). The findings indicated that the innovativeness measures were negatively and significantly correlated with average age and age heterogeneity only at the commonly accepted level of $p< .05$. Of the six team composition variables studied, a weak positive correlation was found between innovativeness and average number of years of education ($p< 0.1$). These correlations identified are consistent with past research. Remaining team variables such as gender heterogeneity, average organizational tenure and organizational tenure heterogeneity were not correlated with innovation.

All of the networking variables were significantly correlated with innovativeness. There were positive correlations between innovativeness and networking with customers ($p< 0.01$), networking with suppliers ($p<0.01$), networking with competitors ($p< 0.05$), networking with universities ($p< 0.05$) and networking with public organizations ($p< 0.01$).

4.5 Regression analysis

The hypotheses were tested with a three-step hierarchical regression analysis, with control variable (team size), team demographics variables and networking as predictors of innovativeness. At Step 1, innovativeness was regressed on the team size. At Step 2, the team variables were added as a block to the regression model. Due to curvilinear relationships predicted, the average age was squared and the logarithm of organizational tenure was used in the analyses. At Step 3, networking variables were added, and the results are displayed on Table 3. The beta coefficients, or standardized regression coefficients, represent the strength of the unique relationship between a predictor variable and innovativeness after controlling for the effects of the other predictor variables in the regression model at that step. The R2 statistics represent the amount of variation in innovativeness that is explained by all the predictor variables in the regression model at that step.

Table 2. Means, Standard Deviations, Alpha Coefficients and Intercorrelations for Variables.

Variables	$\overline{X}$	Σ	α	1	2	3	4	5	6	7	8	9	10	11	12
1. Organizational Innovativeness	4.25	0.82	0.895												
2. Gender Heterogeneity	0.25	0.23	n.a.	0.103											
3. Average Age	43.86	7.62	n.a.	-0.268*	0.059										
4. Age Heterogeneity	0.19	0.12	n.a.	-0.270*	-0.179	0.098									
5. Average Organizational Tenure	11.17	6.73	n.a.	-0.060	0.236*	0.524**	0.046								
6. Organizational Tenure Heterogeneity	0.30	0.34	n.a.	0.027	0.012	-0.058	0.341**	0.272*							
7. Average Number of Years of Education	13.38	2.92	n.a.	0.224[a]	0.019	-0.172	0.066	0.033	0.188						
8. Networking with Customers	0.78	0.41	n.a.	0.389**	0.177	-0.213[a]	-0.133	0.029	-0.112	0.373**					
9. Networking with Suppliers	0.77	0.42	n.a.	0.408**	-0.003	-0.080	-0.057	-0.012	-0.145	0.308**	0.572**				
10. Networking with Competitors	0.24	0.43	n.a.	0.285*	0.131	-0.115	-0.160	0.057	-0.128	0.087	0.298**	0.310**			
11. Networking with Universities	0.22	0.41	n.a.	0.269*	-0.020	-0.092	0.085	-0.037	-0.003	0.348**	0.116	0.287*	0.161		
12. Networking with Public Organizations	0.36	0.48	n.a.	0.404**	0.117	-0.221[a]	-0.094	-0.119	-0.003	0.205a	-0.011	0.147	-0.168	0.147	
13. Team Size	4.04	2.49	n.a.	0.285*	0.107	-0.056	0.066	0.037	0.355**	0.068	0.102	-0.108	0.003	-0.035	0.124

[a] $p < 0.1$; * $p < 0.05$; ** $p < 0.01$

At Step 1, the control variable 'team size' explained a significant ($p < .05$) amount of the variation in innovativeness. Size as a control variable maintained its significance in subsequent steps. At Step 2, the addition of the team demographics variables brought a significant ($p < .05$) increase in the amount of variation explained in innovativeness beyond that explained by the control variable. Age heterogeneity had a negative ($p < .05$) and average years of education ($p < .10$) had a unique positive relationship with innovativeness. Thereby, support for the third and the sixth hypotheses was obtained in the absence of networking variables. At Step 3, adding remaining networking variables again increased the amount of variation explained significantly ($p < 0.001$) beyond that was explained by both control variables and entrepreneurial team characteristics. Only age heterogeneity remained having a significant effect on innovativeness ($p < .05$), thus supporting our third hypothesis. The findings failed to support proposed positive relationships between innovativeness and gender heterogeneity, average age, average tenure, tenure heterogeneity, and education heterogeneity.

Table 3. Hierarchical Regression Analysis.

	Organizational Innovativeness Beta Values		
Predictor Variables	**Step 1**	**Step 2**	**Step 3**
Control Variable			
Team Size	0.285*	0.282*	0.229*
Team Variables			
Gender Heterogeneity		0.029	-0.049
Average Age (Squared)		-0.219	-0.051
Age Heterogeneity		-0.265*	-0.240*
Average Organizational Tenure (Log)		0.023	-0.033
Organizational Tenure Heterogeneity		-0.043	0.126
Average Number of Years of Education		0.186[a]	-0.082
Networking Variables			
Networking with Customers			0.195
Networking with Suppliers			0.193
Networking with Competitors			0.185[a]
Networking with Universities			0.161
Networking with Public Organizations			0.340**
Adjusted R^2	0.069	0.177	0.420
R^2	0.081	0.256	0.516
ΔR^2		0.174	0.260
F	6.377*	3.237**	5.414***
ΔF		2.574*	6.555***

[a] p< 0.1; * p< 0.05; ** p< 0.01; *** p< 0.001

The analysis revealed that networking with public organizations had a significant positive effect on innovativeness ($p< 0.01$) along with a slight positive impact created by networking with competitors ($p< 0.1$), thus validating hypotheses 7c and 7e. However, the results failed to support significant positive relationships expected between innovativeness and networking done with customers, universities, and suppliers (Hypotheses 7a, 7b, 7d). Adding networking variables to the regression equation increased explanatory capacity of the model, reflected in a change in the value of R^2 by .260.

We examined the variance inflation factors (VIFs) for the predictor variables in the full regression model that included control variables as well as team and networking variables. This aimed to assess whether multicollinearity was a serious problem in the regression analysis. As defined, multicollinearity implies how much a given predictor variable correlates with the set of other predictor variables in the regression model. Multicollinearity decreases the likelihood of obtaining statistically significant coefficients by increasing the standard error of the regression coefficient for the predictor variable. The examination of the resulting VIF indices indicated that all values are 2.04 or less; a value below the threshold of ten that is generally used as the

evidence of serious multicollinearity, suggesting that multicollinearity is not a serious problem (Ryan, 1997; Ryan, 2003; Cohen et al., 2003).

5 Discussion and policy implications

Overall, our results suggest that entrepreneurial team characteristics and networking are antecedents of innovativeness capability in small firms after controlling for the effect of size of the entrepreneurial teams. The significant effect of entrepreneurial team size on innovativeness found in Step 1 indicates the importance of optimizing the processes of coordination within the teams in enhancing innovative capability of SMEs.

The significant evidence obtained concerning impact of entrepreneurial team characteristics on innovativeness (Step 2) primarily reveals that increase in age heterogeneity influences innovativeness adversely. This finding is consistent with previous research which argued that increasing age differences bred potential for conflict (Hartel, 2004), which subsequently decreased consensus and cooperation over strategic targets such as enhancement of innovativeness capability. The moderate positive effect of educational backgrounds of team members on innovativeness at this step manifests the value of entrepreneurship training to be provided by universities and other institutions that would eliminate the educational gap.

Concerning networking, respondents admitted that they relied on external sources in order to innovate. However, despite the arguments on the gains of networking with multiple parties (Tsai and Ghoshal, 1998), networking with public institutions was the major contributing variable to small business innovation for the sample. In a sense, this indicates the possibility of redundant relations with other actors. In fact, public policies on protection of intellectual property and public funding allocated, particularly to R&D activities, were found to be critical in enhancing SME innovativeness (Heimonen, 2012). Hence, similar public policies need to be developed and communicated with the aim of furthering SME utilization. In addition, the moderate effect of networking with competitors on innovativeness indicates that novel ideas can be created by either exchanging or combining resources with them. Networking with competitor firms may facilitate pooling of competencies whereby high-quality information and tacit knowledge compiled may trigger firms' innovativeness capacity.

Although firms in the sample more frequently established networks with customers (78.4%) and suppliers (77%), and less with public organizations (36.5%) and competitors (24.3%), our findings validated significant contributions to innovativeness by the latter two only. Various explanations may lie behind the reluctance in utilizing more beneficial networks. This can be partly attributed to the unawareness of entrepreneurial teams of the potential of networking, particularly with public organizations. Inefficiencies due to bureaucracy in reaping the benefits of this opportunity may be another likely cause. On the other end, public organizations may fail to tailor SME programs to the specific needs of small firms. Plus, public organizations' failure in delegating centrally administered power to their local representatives which carry out local relations with SMEs may bring an alternative explanation for the negligence.

When the findings of all steps were considered, it was interesting to see that the positive significant effect of education found in Step 2 disappeared in the next step where networking variables were added into the regression analysis. Added to this is the change in the direction of relationship between Step 2 and 3 for average organizational tenure and both tenure and gender heterogeneity. The interaction effect implications are interesting and may be explored further by future research.

The literature on top management teams led to inconclusive findings concerning team heterogeneity's effect on strategic change (Hambrick and Mason, 1984; Wiersema and Bantel, 1992). The hypothesized relationship of heterogeneity and innovativeness which also entails a strategic move is not completely supported with our findings. The only significant enduring effect in our analysis is that of age heterogeneity which can be classified as a non-job-related heterogeneity. The criticisms with regard to predictive power of team heterogeneity are therefore partly supported by this study. However, the most striking is our finding on possible substitution of the impact created by teams' average educational level with that of networking with public organizations in enhancing innovativeness. As networking with public agencies was introduced in the regression equation in Step 3, the impact of education was offset by their effect. This implies that entrepreneurial teams may balance their educational shortcomings with networks established with public agencies.

The findings, in a way, replicate past arguments (Buğra, 2007) stating that the Turkish private sector owed their existence to the state. Buğra particularly implied that state subsidy policies created a protective climate against foreign competition for decades and kept many firms afloat which otherwise could not survive. Under the influence of past tradition, entrepreneurial teams in the sample viewed their organizational innovativeness mostly dependent on networking with public organizations. Moreover, the substitutability of human capital (average number of years of education) with networking (with public organizations) is a novel finding which may bring new insights in developing innovativeness capacity given the scarcity of talented human resources. Relatively higher contributions on innovativeness made by networking with external stakeholders against self-sufficiency may help public organizations develop a new array of policies. Communicating innovativeness enhancement policies of public agencies directly to SMEs or by way of agents is yet another important issue to be considered.

Moreover, entrepreneurial teams should acknowledge the enormous potential of networking with stakeholders such as suppliers, competitors, customers and universities in enhancing their innovativeness. In order to make plural-actor networking more viable, SMEs need to be provided tools for partnership development and stakeholder engagement. Training programs covering these issues will enhance their networking skills. On the other hand, universities need to review their policies if they are to attract SMEs' attention for collaboration on innovativeness focused projects. Networking with competitors necessitates the existence of a trusting business environment. Therefore, enhancing intellectual property laws and creating an environment of just relations will be crucial towards this end.

6 Limitations of the study and suggestions for future research

Finally, it is important to highlight the various limitations of the research. First, the data is collected from Bursa region which may have its own idiosyncratic features. A potential for bias lies in our focus on a single industrial site which prevents us generalizing our findings to the whole country. Second, the networks in this research are not studied distinguishing weak and strong natures of ties. The flow of knowledge along different types of networks will obviously vary and lead to different outcomes. The development of a full model considering different featured ties provides important opportunity for future researchers. In line with this perspective, studying characteristics of the industrial sites such as proximity or geographic space, which may affect how social networks are shaped, may be worthwhile. Distinguishing different stages in networking may also be of interest to future researchers. Third,

availability of entrepreneurial human and social capital does not adequately clarify how innovation may take place. These types of capital do not adequately explain the effect of cognitive and organizational factors. Therefore, future research may be carried out focusing on different aspects of innovation processes. A focus in issues like changing absorptive capacity of teams would be rewarding in developing a more holistic view of innovativeness. Moreover, networking with public agencies may be further detailed to distinguish local, national, as well as semi-governmental agencies, available in the country. Availability of local institutions (either public or private) in the district acting as a data bank where information is pooled would be an important factor in providing the needed support. Lastly, comparing different structures such as new start-ups in incubators, established firms and high-tech firms may lead to valuable contributions. To conclude, the results presented here are pioneering in that they show the first direct effects of entrepreneurial teams and networking on innovativeness capacity in a sample of SMEs in Bursa, Turkey.

Note: A previous version of this paper has been presented at 2010 SBI Annual Conference, Albuquerque. The authors convey their thanks to the two anonymous reviewers for their invaluable contributions.

7 References

Acs, Z., FitzRoy, F., & Smith, I. (1994). High-technology Employment and University R&D Spillovers: Evidence from US Cities. *Occasional paper no. 50, CIBER*, University of Maryland.

Ahuja, G. (2000). The duality of collaboration: Inducements of opportunities in the formation of interfirm linkages. *Strategic Management Journal, 21,* 317-343.

Allison, P.D. (1978). Measures of inequality. American Sociological Review, 43, 865-880.

Ancona, D.G., & Caldwell, D.F. (1992). Bridging the boundary: External activity in performance in organizational teams. *Administrative Science Quarterly, 37*, 634-665.

Bantel, K. & Jackson, S. (1989). Top management and innovation in banking: Does the composition of the top team make a difference? *Strategic Management Journal, 10*, 107-124.

Barney, J. (2001). Resource-based theories of competitive advantage: A ten-year retrospective in the resource-based view. *Journal of Management, 27*(6), 643-650.

Bantel, K., & Jackson, S. (1989). Top management and innovation in banking: Does the composition of the top team make a difference? *Strategic Management Journal, 10*, 107-124.

Baum, J. A. C., Calabrese, T., & Silverman, B. S. (2000). Don't go it alone: Alliance network composition and start-ups' performance in Canadian biotechnology. *Strategic Management Journal, 21*(3), 267-294.

Bell, G. G. (2005). Clusters, networks and firm innovativeness. *Strategic Management Journal, 26*, 287-295.

Blau, P.M. (1977). *Inequality and Heterogeneity*. New York: The Free Press.

Botwinick, J. (1977). *Aging and Behavior*. Springer, New York.

Bower, D. J. (1993). Successful joint ventures in science parks. *Long Range Planning, 26*(6), 114–120.

Brunetto, Y., & Far-Wharton, R. (2007). The moderating role of trust in sme owner/managers decision making about collaboration. *Journal of Small Business Management, 45*(3), 362-387.

Brunning, O., Nordqvist, M., & Wiklund, J. (2007). Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams. *Small Business Economics, 29*, 295-308.

Buğra, A. (2007). *Devlet ve İşadamları*. İletişim Yayınları, 5th edition.

Burke, D.M., & Leah, L.L. (1981). Memory and aging: The role of retrieval processes. *Psychological Bulletin, 90*, 513-546.

Camelo-Ordaz, C., Hernandez-Lara, A. B., & Valle-Cabrera, R. (2005). The relationship between top management teams and innovative capacity in companies. *Journal of Management Development, 24*(8), 683-705.

Cannella, A.A., Pettigrew, A., & Hambrick, D. (2001). Upper echelons: Donald Hambrick on executives and strategy. *The Academy of Management Executive, 15*(3), 36-42.

Carlsson, G., & Karlsson, K. (1970). Age, cohorts and regeneration of generations. *American Sociological Review, 35*, 710-718.

Carpenter, M. A. (2002). The implications of strategy and social context for the relationship between top management team heterogeneity and firm performance. *Strategic Management Journal, 23*, 275-284.

Carpenter, M.A., Geletkanycz, M.A. & Sanders, W.G. (2004). Upper echelons research revisited: Antecedents, elements, and consequences of top management team composition. *Journal of Management, 30*(6), 749-778.

Child, J. (1974). Managerial and organizational factors associated with company performance. *Journal of Management Studies, 11*, 13-27.

Chung, S. (1999). Korean innovation policies for SMEs. *Science and Public Policy, 26*, 70– 82.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied Multiple Regression /Correlation Analysis for the Behavioral Sciences*. 3rd edition, NJ: Erlbaum: Mahwah.

Cohen, W.M., & Levinthal, D.A. (1990). Absorptive Capacity: A new perspective on learning and innovation. Administrative Science Quarterly, 35, 128-152.

Cooper, A.C., & Bruno, A. (1977). Success among high technology firms. Business Horizons, 20(2), 16–22.

Dakhli, M., & De Clercq, D. (2004). Human capital, social capital and innovation: A multicountry study. Entrepreneurship and Regional Development, 16, 107-128.

Daellenbach, U. S., McCarthy, A. M., & Schoenecker, T. S. (1999). Commitment to innovation: The impact of top management characteristics. R&D Management, 29(3), 199-208.

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal, 34*, 555-590.

Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing, 18*(3), 301-331.

Deshpande, R., & Farley, J. U. (1999). Executive insights: Corporate culture and market orientation: Comparing Indian and Japanese firms. *Journal of International Marketing, 7*(4), 111-127.

Deshpande, R., & Farley, J. U. (2000). Market-focused organizational transformation in China: Global marketing in Great China. *Journal of Global Marketing, 14*, 7-35.

Dodgson, M. (1994). Technological Collaboration and Innovation. In Dodgson, M. and R. Rothwell (Ed.), *The Handbook of Industrial Innovation*. (pp.285-292). Cheltenham: Edward Elgar.

Downs, G., & Mohr, L.(1976). Conceptual issues in the study of innovation. *Administrative Science Quarterly, 21*, 700-714.

Eisenhardt, K., & Schoonhoven, C. B. (1990). Organizational growth: Liking founding team, strategy, environment and growth among U.S. semiconductor ventures. *Administrative Science Quarterly, 3*, 504-529.

Elfring, T. & Hulsink, W. (2007). Networking by entrepreneurs: Patterns of tie-formation among emerging organizations. *Organization Studies, 28*(12), 1849-1872.

Freel, M. (2000). External linkages and product innovation in small manufacturing firms. *Entrepreneurship and Regional Development, 12*, 245-266.

Freel, M. (2003). Sectoral patterns of small firm innovation, networking and proximity. *Research Policy, 32*, 751-770.

Gibb, A. (1995). Learning skills for all: The key to success in small business development. In ICSB Annual Conference Proceedings (pp. 1-21).

Glass, A. (2007). Understanding Generational Differences for Competitive Success. *Industrial and Commercial Training, 39*(2), 98-103.

Greve, A., & Salaff, J. V. (2003). Social networks and entrepreneurship. *Entrepreneurship Theory and Practice, 28*(1), 1-22.

Griffin, A. (2002). Product development cycle time for business to business products. *Industrial Marketing Management, 31*(4), 291–304.

Hakansson, H., & Snehota, I.(1990). *No business is an island: The network concept of business strategy*. In D. Ford (Ed.), Understanding Business Markets (pp.526-540). London: Academic Press.

Hambrick, D. C., & Mason, P. A.(1984). Upper Echelons: The Organization as a Reflection of Its Top Managers. *Academy of Management Review, 9*, 193-206.

Hartel, C. E. (2004). Towards a multicultural world: Identifying work systems, practices and employee attitudes that embrace diversity. *Australian Journal of Management, 29*(2), 189-200.

Hayes, R., & Abernathy, W. (1980). Managing our way to economic decline. *Harvard Business Review, 57*(4), 11-25.

Hassink, R. (2002). Regional innovation support systems: Recent trends in Germany and East Asia. *European Planning Studies, 10*(2), 153-164.

Heimonen, T. (2012). What are the factors that affect innovation in growing SMEs? *European Journal of Innovation Management, 15*(1), 122-144.

Hendry, C., Arthur, M., & Jones, A. (1995). *Strategy Through People*. London: Routlege.

Hoffman, L. R., & N. R. F. Maier (1961). Quality and acceptance of problem solutions by members of homogeneous and heterogeneous groups. *Journal of Abnormal and Social Psychology, 62,* 401-407.

Inkpen, A. C., & Tsang, E. W. K. (2005). Social capital, networks and knowledge transfer. *Academy of Management Review, 30*(1), 146-165.

Jack, S. (2005). The role, use and activation of the strong and weak network ties: A qualitative analysis. *Journal of Management Studies, 42*(6), 1233-1259.

Kale, P., & Singh, H. (2007). Building firm capabilities through learning: The role of alliance learning process in alliance capability and firm-level alliance success.

Strategic Management Journal, 28(10), 981-1000.

Karlsson, C., & Olsson, O. (1998). Product innovation in small and large enterprises. *Small Business Economics, 10*, 31-46.

Katz, R. (1982). The effects of group longevity on project communication and performance. *Administrative Science Quarterly, 27*, 81-104.

Kimberly, J.R., & Evanisko, M.J. (1981). Organizational innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal, 24*, 689-713.

Kitchell, S. (1997). CEO characteristics and technological innovativeness: A Canadian perspective. *Canadian Journal of Administrative Sciences, 14*(2), 111-125.

Leonard, D., & Sensiper, S. (1998). The role of tacit knowledge in group innovation. *California Management Review, 40*(3), 112-132.

Levinthal, D. A., & March, J.G. (1993). The myopia of learning. *Strategic Management Journal, 14*, 95-112.

Li, C.R. (2012). How top management team diversity fosters organizational ambidexterity: The role of social capital among top executives. *Journal of Organization Change Management, 26*(5), 874-896.

Ling, Y. & Kellermanns, F. W. (2010). The effects of family firm specific sources of TMT diversity: The moderating role of information exchange frequency. *Journal of Management Studies, 47*(2), 322-344.

Lyon, D., Lumpkin, G., & Dess, G. (2000). Enhancing entrepreneurial orientation research: Operationalizing and measuring a key strategic decision-making process. *Journal of Management, 26*(5), 1055-1085.

Massa, S., & Tessa, S. (2008). Innovation and SMEs: Misaligned perspectives and goals among entrepreneurs, academics, and policy makers. *Technovation,* 393-407.

Millson, M. R., Raj, S. P., & Wilemon, D. (1996). Strategic Partnering for Developing New Products. *Research Technology Management, 39*(3), 41-49.

Molina-Moralez, F. X., & Martinez-Fernandez, M. T. (2010). Social networks: Effect of social capital on firm innovation. *Journal of Small Business Management, 48*(2), 258-279.

Nahaipet, J. & Ghoshal, S. (1998). Social capital, intellectual capital and the organizational advantage. *Academy of Management Review, 23*(42), 242-266.

Nalebuff, B.J., & Brandenburger, A. M. (1997). Co-opetition: Competitive and cooperative business strategies for the digital economy. *Strategy & Leadership, 25*(6), 28 – 35.

Naranjo-Gil, D., Hartmann, F., & Maas, V. S. (2012). Top management team heterogeneity, strategic change and operational performance. *British Journal of Management, 19,* 222-234.

Noteboom, B. (1994). Innovation and diffusion in small firms: Theory and evidence. *Small Business Economics, 6*(5), 327-347.

North, D., & Smallbone, D. (2000). Innovative activity in SMEs and rural economic development: Some evidence from England. *European Planning Studies, 8*(1), 87-106.

Nunnally, J. C. (1978). Psychometric Theory. McGraw Hill Book Company, New York.

O'Reilly, C., & Tushman, M. L. (2004). The ambidextrous organization. *Harvard*

Business Review, 82(4), 74-81.

Peteraf, M. A. (1993). The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal, 14*(3), 179-191.

Pirolo, L., & Presutti, M. (2010). The impact of social capital on the start-ups' performance growth. *Journal of Small Business Management, 48*(2), 198-227.

Prahalad, C.K., & Ramaswamy, V. (2004). Co-creating unique value with customers. *Strategy and Leadership, 32*(3), 4-9.

Reams, R. (1986). University–Industry Research Partnerships. Quorum: Westport, CT.

Ramcharran, H. (2001). Inter-firm linkage and profitability in the automobile industry: The implications for supply chain management. *The Journal of Supply Chain Management, 37*(1), 11-17.

Rothwell, R. (1991). External networking and innovation in small and medium size manufacturing firms in Europe. *Technovation, 11*(2), 93-112.

Rothwell, R., & Dodgson, M. (1991). External linkages and innovation in small and medium-sized enterprises. *R&D Management, 21*, 125-137.

Rothwell, R., & Gardiner, P. (1985). Invention, innovation, re-innovation and the role of the user: A case study of British hovercraft development. *Technovation, 3*, 167-186.

Ryan, T. P. (1997). *Modern Regression Methods*. John Wiley and Sons, New York.

Ryan, T. P. (2003). *Modern Regression Methods*. New York: John Wiley and Sons.

Saxenian, A. (1994). *Regional Advantage*. Harvard University Press: Cambridge, MA.

Seghers, A., Manigart, S., & Vanacker, T. (2012). The impact of human and social capital on entrepreneurs' knowledge of finance alternatives. *Journal of Small Business Management, 50*(1), 63-86.

Sethi, R., Smith, D. C., & Park, C. (2002). How to kill a team's creativity. *Harvard Business Review, 80*(8), 73-86.

Shrader, R., & Siegel, D. S. (2007). Assessing the relationship between human capital and firm performance: Evidence from technology-based new ventures. *Entrepreneurship Theory and Practice, 31*(6), 893-908.

SIS (2002). Genel Sanayi İşyerleri Sayımı, Ankara, Turkey: Turkish State Institute of Statistics.

Sonfield, M., Lussier, R., Corman, J., & McKinney, M. (2001). Gender comparison in decision making: An empirical analysis of the entrepreneurial strategy matrix. *Journal of Small Business Management, 39* (2), 165–173.

Spence, L.J., Schmitpeter, R., & Habisch, A. (2003). Assessing social capital: Small and medium-sized enterprises in Germany and U.K.. *Journal of Business Ethics, 47*(1), 17-29.

Su, Y. S., Tsang, E. W. K., & Peng, M. W. (2009). How do internal capabilities and external partnerships affect innovativeness? *Asian Pacific Journal of Management, 26*, 309-331.

Taqi, A. (2002). Older people, work and equal opportunity. *International Social Security Review, 55*(1), 107-120.

Thomke, S., & Von Hippel, E. (2001). Customers as innovators: A new way to create value. *Harvard Business Review, 80*(4), 74-81.

Tidd, J., Bessant, J., & Pavitt, K. (1997). *Managing Innovation: Integrating Technological, Market and Organizational Change*. West Sussex: John Wiley &

Sons.

Tsai, W. (2000). Knowledge transfer in intraorganizational networks: Effect of network position and absorptive capacity on business unit innovation and performance. *Academy of Management Journal, 44*(5), 996-1004.

Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal, 41*(4), 464–478.

Turnbull, P., Oliver, N., & Wilkinson, B. (1992). Buyer-supplier relations in the UK automotive industry: Strategic implications of the Japanese manufacturing model. *Strategic Management Journal, 13*, 159-168.

Üçbaşaran, D., Lockett, A., Wright, M., & Westhead, P. (2003). Entrepreneurial founder teams: Factors associated with team member entry and exit. *Entrepreneurship Theory and Practice, 28*(3), 107–128.

Varis, M., & Littunen, H. (2010). Types of information, sources of innovation and performance in entrepreneurial SMEs. *European Journal of Innovation Management, 13*(2), 128-154.

Von Hippel, E., & Katz, R. (2002). Shifting innovation to users via toolkits. *Management Science, 48*(7), 821-833.

Vroom, V., & Pahl, B.(1971). Relationship between age and risk-taking among managers. *Journal of Applied Psychology, 55*, 399-405.

Walker, G., Kogut, B., & Shan, W. J. (1997). Social capital, structure holes, and the formation of an industry network. *Organization Science, 8*(2), 109–125.

Wang, C. L., & Ahmed, P. K. (2004). The development and validation of the organizational innovativeness construct using confirmatory factor analysis. *European Journal of Innovation Management, 7*(4), 303-313.

West, M.A., & Farr, J. L. (1990). *Innovation and Creativity at Work: Psychological and Organizational Strategies*. New York: Wiley.

Westhead, P., Cowling, M., & Howorth, C. (2001). The development of family companies: Management and ownership imperatives. *Family Business Review, 14*(4), 369-385.

Westhead, P., & Storey, D. (1995). Links between higher education institutions and high technology firms. *Omega, 23*, 345-360.

Wicklund, J., & Shephard, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium sized businesses. *Strategic Management Journal, 24,* 1307-1314.

Wiersema, M. F., & Bantel, K.A. (1992). Top management team demography and corporate strategic change. *Academy of Management Journal, 35*, 91-121.

Wilkinson, F., Lawson, C, Keeble, D., Lawton-Smith, H., & Moore, B. (1996). Innovative behaviour of technology-based SMEs. Paper presented at the joint CBR/Warwick SME Centre conference. University of Cambridge, Cambridge.

Wood, W. (1987). Meta-analytic review of sex differences in group performance. *Psychological Bulletin, 102*, 53.

Zaheer, A., & Bell, G. G. (2005). Benefits from network position: firm capabilities, structural holes and performance. *Strategic Management Journal, 26*, 809-825.

Zaidi, S. M. A., Saif, M. I., & Zaheer, A. (2010). The effect of workgroup heterogeneity on decision making: An empirical investigation. *African Journal of Business Management, 4*(10), 2132-2139.