

## **A SOCIAL NETWORK PERSPECTIVE ON THE DEAL FLOW OF BUSINESS ANGELS**

CHRISTOPH GARBOTZ  
RWTH Aachen University  
Templergraben 64, 52056 Aachen, Germany

ANDREAS ENGELEN  
RWTH Aachen University

PHILIPP NIEMANN  
RWTH Aachen University

### **ABSTRACT**

Business angels play a crucial role in new venture financing, but “the private investor market is still largely incompletely understood, inefficient and understudied” (Baty & Sommer, 2002: 290). Based on an empirical study we investigate different drivers of business angels’ two deal flow dimensions, i.e. quantity and quality.

### **INTRODUCTION**

Business angels (BAs) have been recognized as being a key source of early stage financing (Wiltbank, Read, Dew, & Sarasvathy, 2009). The term deal flow (DF) describes the generation of a steady stream of potential investment opportunities (Wiltbank, 2005) and can be expressed in terms of two dimensions—quantity and quality. Previous studies have highlighted the importance of a BA’s contact network for the acquisition of DF (e.g., Fiet, 1995). The present study develops and empirically tests distinct theoretical models that look at the drivers of DF acquired through a BA’s contact network, and accounts for the two different dimensions, quantity and quality.

### **THEORETICAL PREMISES**

Social capital can be understood as embodied in the social structure of relationships between and among actors (Burt, 1992; Coleman, 1988). Within sociological research there are two opposing views on which network structure is more beneficial with regard to the attainment of goals that individual actors intend to reach: ‘network openness’ versus ‘network closure.’ Granovetter (1973) and Burt (1992) see open network structures as beneficial, since new and non-redundant information will enter the network mainly through weak ties, and potential brokerage opportunities for the focal actor (ego) will arise when structural holes within his/her ego-network exist. In terms of ‘network closure’, strong ties and cohesive network structures that build trust among actors and help to establish norms that facilitate cooperation are emphasized (Coleman, 1988).

DF quantity refers to the number of investment opportunities coming to the attention of a BA in a certain period of time before any selection is made (Mansson & Landström, 2006). We

use the number of investments actually made as a measure for DF quality (Böhner, 2007). In line with existing research on formal venture capital (VC), a first structuring of the sources of DF can be made between cold calls, active search and the contact network, i.e. referrals (Steier & Greenwood, 1995).

## RESEARCH MODEL

Based on these theoretical premises, the following hypotheses were derived:

*Hypothesis 1: The number of weak ties within the contact network of a business angel is positively associated with*

- (i) the business angel's deal flow quantity.*
- (ii) the business angel's deal flow quality.*

*Hypothesis 2: The number of strong ties within the contact network of a business angel is positively associated with*

- (i) the business angel's deal flow quantity.*
- (ii) the business angel's deal flow quality.*

*Hypothesis 3: The heterogeneity of a business angel's contact network is positively related to*

- (i) the business angel's deal flow quantity.*
- (ii) the business angel's deal flow quality.*

*Hypothesis 4: A larger effective size of the business angel's contact network will positively affect*

- (i) the business angel's deal flow quantity.*
- (ii) the business angel's deal flow quality.*

*Hypothesis 5: A higher constraint within the contact network of a business angel will negatively affect*

- (i) the business angel's deal flow quantity.*
- (ii) the business angel's deal flow quality.*

## METHODOLOGY

### Sample

The data used in this study for further analyses cover the activities of 101 BAs with an overall experience of 1227 angel investments made, including ego-centric network data on 579 individuals (alters) named by participating BAs (egos). The questionnaire gathered information from the perspective of the individual angel, focusing on individual angel investors' history of new venture investing. The sample was tested for bias in answering behavior (Armstrong & Overton, 1977). The sample revealed no substantial bias. The potential problem of common method was controlled for using Harman's Single Factor-Test (Podsakoff & Organ, 1986) which showed no evidence of severe common method variance in the present analysis.

### Measures

To capture each BA's set of direct contacts we used a two-step name generator approach. In the second step participants could list up to eight alters. Given the set of relevant alters, the strength of each relationship between ego and his/her alters was assessed. In addition, participants were asked to specify the named contacts with regard to which category of DF (e.g., BA, VC, family/friends etc.) they belonged to. To calculate structural hole measures, participants finally filled out an adjacency matrix indicating whether there were any relationships among the alters.

*Deal Flow Quantity:* The dependent variable 'Deal Flow Quantity' is the product of the average number of investment opportunities received per year (Mansson & Landström, 2006) multiplied by the percentage share of investment opportunities received through the BA's contact network.

*Deal Flow Quality:* The dependant variable 'Deal Flow Quality' is measured as the number of investments made per year that originate from the contact network of the BA (Böhner, 2007).

*Tie Strength:* Tie strength was measured by closeness (Burt, Hogarth, & Michaud, 2000; Reagans, 2005), frequency (Burt et al., 2000; Reagans, 2005), and duration (Perry-Smith, 2006).

*Heterogeneity:* Participating BAs specified their named alters according to one of the pre-defined categories of DF with multiple naming being possible (Brettel, 2003; Harrison & Mason, 2007; Paul, Whittam, & Johnston, 2003). To measure heterogeneity with regard to the DF categories that the direct contact network of a BA comprises, we used Blau's index of heterogeneity (Blau, 1977).

*Effective Size and Constraint:* We calculated the structural holes measures as proposed by Burt (1992).

*Control Variables:* Our baseline models include as controls: *Total venture investments* (Wiltbank et al., 2009), *Investment experience* (Wiltbank et al., 2009), *Entrepreneurial experience* (Wiltbank et al., 2009), *Membership in a private Business Angel Network* (Mason & Harrison, 1997), and *Membership in a publicly funded Business Angel Network* (Knyphausen-Aufsess & Westphal, 2008; Mason & Harrison, 1997).

This study employs multivariate OLS regression as a method of analysis. For the calculations made, SPSS 17.0 was used. To compute Burt's structural holes measures we used E-NET (Borgatti, 2006), a program written for analyzing ego-networks.

## FINDINGS

### Deal Flow Quantity

In the baseline model that includes only the control variables, total venture investments ( $p < .01$ ) as well as membership in a private BAN ( $p < .05$ ) have a significant effect on DF quantity ( $R^2 = .20, p < .01$ ). Results of the regression models show that on all three dimensions strong ties are significantly related to DF quantity. To further understand the effects of weak vs. strong ties, we calculated a separate model that included a global measure of weak and strong ties, each comprising all three dimensions. In this model, strong ties are significantly ( $\beta = .19; p < .05$ ) related to DF quantity ( $R^2 = .25, p < .01$ ), but weak ties are not ( $\beta = .15; n.s.$ ), thereby lending further support for hypothesis 2 (i). As a result, hypothesis 1 (i) is not supported whereas hypothesis 2 (i) is.

As there is no significant effect of heterogeneity on DF quantity, this leaves hypothesis 3 (i) unsupported. Hypothesis 4 (i) argues that a higher effective size would lead to the acquisition of more investment opportunities, which is not supported. According to hypothesis 5 (i), a higher constraint should have a negative effect on DF quantity. The corresponding regression model shows that the relationship between constraint and DF quantity is not significant. Thus, hypothesis 5 (i) is not supported.

### Deal Flow Quality

In the baseline model experience as a BA ( $p < .05$ ) shows a significant effect on DF quality ( $R^2 = .05$ , n.s.). According to hypothesis 1 (ii), weak ties have a positive effect on DF quality. As is the case for DF quantity, this holds true for the dimensions of frequency and duration but not for closeness. In contrast to hypothesis 1 (ii), hypothesis 2 (ii) postulates that strong ties are positively related to DF quality. Results of the corresponding regression models show support for all three tie strength dimensions with regard to strong ties. In line with the approach taken for DF quantity and to further understand the effects of strong vs. weak ties, a separate model was run that included just one global measure for tie strength. Results show strong support for hypothesis 2 (ii), since in this model strong ties are significantly ( $\beta = .32$ ;  $p < .01$ ) related to DF quality ( $R^2 = .16$ ,  $p < .01$ ) whereas weak ties are not ( $\beta = .14$ ; n.s.). Hypothesis 2 (ii) is therefore supported. In contrast, weak ties were not found to be significantly related to DF quality, leaving hypothesis 1 (ii) unsupported.

As postulated in hypothesis 3 (ii), the regression model shows a highly significant effect ( $p < .01$ ) of heterogeneity on the quality of DF. Therefore, this hypothesis is supported. Effective size is found to have a positive effect ( $p < .10$ ) on the quality of investments received, therefore providing support for hypothesis 4 (ii). Results of our analysis show no support for hypothesis 5 (ii).

## DISCUSSION

Our study makes several contributions to existing BA research: (1) When analyzing the DF of BAs, it is essential to differentiate between the quantity and quality, as they relate to different dimensions. (2) As shown by the results of the regression models, the drivers of DF quantity and quality are different. (3) As becomes obvious when looking at the baseline model for DF quality, factors already identified as significant in existing research on angel investing contribute only a small part to the explanation of the variance of DF ( $R^2 = .05$ , adjusted  $R^2 = .01$ ). In our opinion, these results underline the importance of factors that take the characteristics of a BA's contact network into account, as done in this study. (4) Although Granovetter (1973) suggested the three components of tie strength used in this study, so far existing research has typically used only a single measure of tie strength such as closeness (Obstfeld, 2005; Seibert, Kraimer, & Liden, 2001) or frequency (Granovetter, 1973; Nelson, 1989). Just recently, studies have begun to use all three components of tie strength (Perry-Smith, 2006). Findings from our study show strong support for using all three components when assessing the tie strength of relationships, since relying on just one single component may result in misleading interpretations. (5) In terms of the relational embeddedness of the BA within his/her contact network, results of our study support the view in favor of network closure, since with regard to DF quantity and quality it is the strong ties that yield beneficial results to the BA. In the specific context of BA investing, this

means that strong ties and the trust inherent in those relationships seem to outweigh the potential benefits of weak ties. The existence of strong ties fosters the transfer of sensitive information (i.e. information on potential investment opportunities) that is in line with existing research (Hansen, 1999; Uzzi, 1997). (6) Our results suggest that it is important to continue to look at the relational and structural network characteristics separately, since their effects may differ as already highlighted in other studies from different contexts (Hansen, 1999; Perry-Smith, 2006; Seibert et al., 2001). The major practical implication our study holds for BAs is to actively care for their own contact network and to develop it, since it is a valuable resource (or probably the most valuable one) with regard to the generation of DF.

## REFERENCES

- Armstrong, J. S. & Overton, T. S. 1977. Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, 14: 396–402.
- Baty, G. & Sommer, B. 2002. True then, true now: A 40-year perspective on the early stage investment market. *Venture Capital*, 4: 289–293.
- Blau, P. M. 1977. *Inequality and heterogeneity*. New York, London: The Free Press.
- Böhner, I. 2007. *Network, network position, and the deal flow of venture capital firms* Wiesbaden: Deutscher Universitätsverlag.
- Borgatti, S. P. 2006. *E-net software for the analysis of ego-network data*. Needham, MA: Analytic Technologies.
- Brettel, M. 2003. Business angels in Germany: A research note. *Venture Capital*, 5: 251–268.
- Burt, R. S. 1992. *Structural holes* Cambridge, MA: Harvard University Press.
- Burt, R. S., Hogarth, R. M., & Michaud, C. 2000. The social capital of French and American managers. *Organization Science*, 11: 123–147.
- Coleman, J. S. 1988. Social capital in the creation of human capital. *The American Journal of Sociology*, 94: 95–120.
- Fiet, J. O. 1995. Reliance upon informants in the venture capital industry. *Journal of Business Venturing*, 10: 195–223.
- Granovetter, M. 1973. The strength of weak ties. *The American Journal of Sociology*, 78: 1360–1380.
- Hansen, M. T. 1999. The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 44: 82–111.

- Harrison, R. T. & Mason, C. M. 2007. Does gender matter? Women business angels and the supply of entrepreneurial finance. *Entrepreneurship Theory and Practice*, 31: 445–472.
- Knyphausen-Aufsess, D. Z. & Westphal, R. 2008. Do business angel networks deliver value to business angels? *Venture Capital*, 10: 149–169.
- Mansson, N. & Landström, H. 2006. Business angels in a changing economy: The case of Sweden. *Venture Capital*, 8: 281–301.
- Mason, C. M. & Harrison, R. T. 1997. Business angel networks and the development of the informal venture capital market in the U.K.: Is there still a role for the public sector? *Small Business Economics*, 9: 111–123.
- Nelson, R. E. 1989. The strength of strong ties: Social networks and intergroup conflict in organizations. *Academy of Management Journal*, 32: 377–401.
- Obstfeld, D. 2005. Social networks, the tertius iungens orientation, and involvement in innovation. *Administrative Science Quarterly*, 50: 100–130.
- Paul, S., Whittam, G., & Johnston, J. B. 2003. The operation of the informal venture capital market in Scotland. *Venture Capital*, 5: 313–335.
- Perry-Smith, J. E. 2006. Social yet creative: The role of social relationships in facilitating individual creativity. *Academy of Management Journal*, 49: 85–101.
- Podsakoff, P. M. & Organ, D. W. 1986. Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12: 531.
- Reagans, R. 2005. Preferences, identity, and competition: Predicting tie strength from demographic data. *Management Science*, 51: 1374–1383.
- Seibert, S. E., Kraimer, M. L., & Liden, R. C. 2001. A social capital theory of career success. *Academy of Management Journal*, 44: 219–237.
- Steier, L. & Greenwood, R. 1995. Venture capitalist relationships in the deal structuring and post-investment stages of new firm creation. *Journal of Management Studies*, 32: 337–357.
- Uzzi, B. 1997. Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42: 35–67.
- Wiltbank, R. 2005. Investment practices and outcomes of informal venture investors. *Venture Capital*, 7: 343–357.
- Wiltbank, R., Read, S., Dew, N., & Sarasvathy, S. D. 2009. Prediction and control under uncertainty: Outcomes in angel investing. *Journal of Business Venturing*, 24: 116–133.

Copyright of Academy of Management Proceedings is the property of Academy of Management and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.

Copyright of Academy of Management Annual Meeting Proceedings is the property of Academy of Management and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.