Network Support and the Success of Newly Founded Businesses

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ABSTRACT. The "network approach to entrepreneurship" is a prominent theoretical perspective within the literature on entrepreneurship. This literature assumes that network resources, networking activities and network support are heavily used to establish new firms (network founding hypothesis). Further, those entrepreneurs who can refer to a broad and diverse social network and who receive much support from their network are more successful (network success hypothesis). Based on a study of 1,700 new business ventures in Upper Bavaria (Germany), the article gives an empirical test of the network success hypothesis. It is argued that one reason, why previous studies did not consistently find positive network effects, may be that social capital (network support) is used to compensate shortfalls of other types of capital (human capital and financial capital). This compensation hypothesis, however, does not find empirical confirmation. On the other hand, however, the network success hypothesis proves to be valid in our analyses, i.e. network support increases the probability of survival and growth of newly founded businesses.

I. Introduction

If we look at the debate and literature on entrepreneurship, we can see that the topic of social networks is a prominent and outstanding issue. This literature assumes that entrepreneurs try to mobilize, and actually benefit from social network resources in the start-up period of their businesses. Indeed, there is plenty of empirical evidence that illustrates the importance of social ties in the formation and maintenance of new enterprises. Nevertheless, neither from a theoretical point of view nor from the empirical side we can be fully satisfied with these accounts. Concerning the theory, the discussion about networking of entrepreneurs uses the language of social networks, but very seldom the real concepts and statistical tools of general network analysis are employed. Empirically, many studies about entrepreneurship and social networks mainly follow a qualitative approach, they are based on small samples, and they ignore important variables that should be controlled for by appropriate statistical procedures. This paper focuses on the just mentioned empirical problems. We will present the results of empirical analyses intending to test two hypotheses of the network approach to entrepreneurship. According to our opinion, an adequate design of the study, a large sample and elaborated statistical techniques are the main advantages of our analyses.

The plan of the paper is as follows: Section II begins with some general comments on the so-called network approach to entrepreneurship. By that, the two hypotheses we want to test are specified and developed. Section III introduces our empirical data, and describes the variables and methods we will use. The presentation of the empirical findings in Section IV centers around the two hypotheses. Section IV.1 refers to the "network compensation hypothesis", and Section IV.2 to the "network success hypothesis" (these are the shorthand labels we will use for the two hypotheses). Section IV.2 includes the results of a baseline model of entrepreneurial performance that captures crucial determinants of the success of newly founded businesses. These results may be interesting, independent of our discussion about

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social network support. The final Section V concludes the paper.

II. Theory: Compensation and success via social support?

Mainly initiated by the research group around Howard Aldrich, "the network approach to entrepreneurship" (Aldrich and Zimmer, 1986) has become one of the most popular theoretical perspectives in the debate about self-employment, entrepreneurship and small business formation. The social capital metaphor competes with theoretical perspectives like human capital theory, transaction cost economics, or organizational ecology. To be more specific, we must begin with the observation that there are two, very different network approaches to entrepreneurship. The first one pertains to the personal network of entrepreneurs, i.e. to individual relations of business founders as focal persons; the second one concentrates on the organizational network of businesses, i.e. on collective relations new firms are embedded in (Dubini and Aldrich, 1991; Uzzi, 1996). Most empirical research in the field uses the "personal network perspective" (as opposed to the "organizational network perspective"), and alike – in what follows – we will confine our interest to this approach.

The common idea of the personal network perspective is the premise that entrepreneurship is a social role, embedded in a social, political, and cultural context. Thus, entrepreneurs should not be viewed as isolated and autonomous decision makers, but as actors involved into a special micro-context. The approach "focuses on entrepreneurship as embedded in a social context, channelled and facilitated or constrained and inhibited by people's positions in social networks" (Aldrich and Zimmer, 1986, p. 14). If we conceive of entrepreneurs as organizers and coordinators of resources (Hébert and Link, 1989), social networking is directly connected with the very idea of an entrepreneur. The organization and coordination of resources require social activity and social interactions. The building up of a new business means that existing social relationships have to be activated and new ones created. So, entrepreneurship is a relational task, a combinatorial problem, it is "inherently a networking activity" (Dubini and Aldrich, 1991, p. 306).

Now, if we inspect a couple of research papers using the personal network perspective in the context of entrepreneurship (e.g., Birley, 1985; Aldrich et al., 1987; Carsrud et al., 1987; Zimmer and Aldrich, 1987; Aldrich, 1989; Aldrich et al., 1989; Bögenhold, 1989; Boissevain et al., 1990; Nohria, 1992; Bögenhold and Staber, 1994, Chapt. VI; Donckels and Lambrecht, 1995; Sanders and Nee, 1996), we can find that these papers are dealing with two different topics. Most of them refer to the founding process of new businesses, a smaller proportion to processes after founding. Concerning the founding process, the main hypothesis is that network resources, networking activities and network support are heavily used to establish new firms, and thus, social networks stimulate entrepreneurship (Burt, 1992, p. 36; to have a label we could speak of the "network founding hypothesis"). Concerning processes after founding, there is a similar hypothesis, namely that entrepreneurs, who can refer to a broad and diverse personal network and who receive much support from it are more successful. This hypothesis postulates a connection between network structure or network support and organizational performance (Dubini and Aldrich, 1991). We will call it "network success hypothesis", and the main thrust of our empirical analyses will be on this hypothesis.

Undoubtedly, there are good reasons to expect that network support improves success of newly founded businesses. The literature discusses these reasons under the heading of "functions served by networks" (Powell and Smith-Doerr, 1994, p. 372; see also Boissevain et al., 1990). These functions describe mechanisms by which networks improve success, and at least three mechanisms are commonly identified: (1) Social relations and social contacts are important channels for gaining access to information. Compared with information received from formal sources, information received from network ties is often assumed to be more useful, reliable, exclusive, and less redundant. In particular, weak ties are assumed to provide valuable information, because this information often comes from distant parts of the social system (Granovetter, 1974, 1983). If a crucial problem faced by prospective entrepreneurs is to

gather reliable information on market conditions and opportunities, then large personal networks with many weak ties should stimulate organizational success. (2) Furthermore, network contacts give access to customers and suppliers. Finding enough customers obviously determines the success of a new business. A diverse network might be very helpful for this, because friends and acquaintances as the first customers might spread information on the new firm via their own networks (a description of such "snowball effects" can be found in Bögenhold, 1989). (3) Finally, network contacts may open the possibility to broaden the financial basis of a new firm. Informal credits received from relatives or acquaintances are especially helpful in the start-up phase. The literature on ethnic entrepreneurship emphasizes the role played by rotating credit associations, which can be seen as a kind of ethnic network (e.g., Yoon, 1991). Given the financial restrictions many new firms are confronted with, the credit raising function of social relations seems to be important.

Besides these general network functions, we can identify further mechanisms by which a special network type – the family network – increases success: It gives access to unpaid family work and provides emotional support. Especially during the start-up phase, unpaid work from family members can compensate for financial restrictions. Moreover, loyal employees recruited from the family reduce the effort the new entrepreneur has to put in controlling workers. Finally, frustrating events that force down overly optimistic initial expectations are not seldom, especially during the start-up phase. In this situation, emotional support received from the spouse might be very helpful to sustain emotional stability. These are some reasons why entrepreneurs who receive much support from the family might be more successful (further arguments can be found in Sanders and Nee, 1996).

Despite its plausibility, however, empirical studies in the field did have trouble to find positive effects of networking variables on entrepreneurial performance and success. In a study of business founders in North Carolina, Aldrich et al. (1987), for example, could not find convincing effects of six networking measures on business profitability. For a large sample of Asian immigrant and non-minority businesses in the U.S., Bates (1994) comes to the result that heavy use of social support networks typifies the less profitable and more failure-prone businesses. Bates' provocative conclusion is that – contrary to the network success hypothesis – networking activities and network support may not be beneficial to newly established businesses. Similarly, Yoon (1991) concludes that Korean immigrants in Chicago profit only during the start-up phase from ethnic networks. Later on, networks become irrelevant and factors like human capital gain importance. We suspect that two reasons are responsible for inconclusive and contradictory findings of previous research. The first reason concerns differences of operationalization, and the second will lead us to our "compensation hypothesis".

The social capital concept (for a general discussion, Coleman, 1990, Chapt. 12) is so broad and vague that nearly everything can be subsumed under this label. We can identify two strategies for operationalizing the network approach to entrepreneurship. A first strategy accentuates general characteristics of the personal network entrepreneurs are embedded in, and explores effects of these characteristics on business performance. Examples of such characteristics are network size, network density, network diversity, the preponderance of strong or weak ties, and network redundancy. These general properties of social networks pertain to the ability and potential of a personal network to provide resources to entrepreneurs (Aldrich and Zimmer, 1986) and give us a description of the opportunity structure. This approach does not measure to which extent founders actually made use of their opportunities. However, networks will improve the success only, if the entrepreneur makes use of them. Thus, this strategy does not measure directly the theoretically relevant construct: support received from the network. If some entrepreneurs do not make full use of the potential of their network, this strategy may lead astray. The second strategy looks at activities carried out by entrepreneurs in the formation stage of their businesses and at the amount of support which entrepreneurs received out of their network. So, we may observe how many people the entrepreneur talked to about starting and running his or her business, to which degree the founder mobilized strong and weak ties, or

how many hours per week the entrepreneur discussed specific business matters with friends and acquaintances (Aldrich et al., 1987; Aldrich et al., 1989; Bögenhold and Staber, 1994, Chapt. VI). This is the more direct way to test the network success hypothesis. It comes as no surprise that these two strategies might yield contradictory empirical evidence.

Most previous research (and our study, too) followed the second strategy and investigated networking activities and the amount of network support entrepreneurs actually received. These activities and the amount of support, however, may be the result of two factors: On the one hand, we can expect that – based on the opportunity structure – an entrepreneur embedded in a broad and diverse social network will receive more help out of it. On the other hand, it is reasonable to expect that entrepreneurs embedded in a confined social network or lacking other basic resources (human capital and financial capital) will try harder to mobilize support out of their private networks. There are many hints in the empirical literature – especially in qualitative descriptions of ethnic enterprises (Waldinger et al., 1990; Light and Bhachu, 1993) – that disadvantaged groups make more efforts and are more successful to activate their private network resources, i.e. they compensate for an unfavourable position by referring to their personal ties.

We can condense this reasoning in a "network compensation hypothesis", which states that entrepreneurs with a less favourable human capital profile and with restricted financial resources struggle harder to mobilize their social contacts and receive more support out of their network. A compensation mechanism with respect to human capital is explicitly expected by Light and Karageorgis (1994, p. 658); they suppose that "highly developed social networks . . . can compensate shortfalls of human capital". If the compensation hypothesis holds true, we would have an explanation why many empirical studies did not find positive effects of network support on business performance. The explanation would be that entrepreneurs resorting to social support start with businesses that do not have good prospects because of other critical dimensions (human capital of the founder and start-up capital of the firm). Only after controlling for these "other critical variables", positive influences of social support should be observed.

Summarizing our short sketch of the network approach to entrepreneurship and pointing to its empirical implications, we can formulate the following four predictions: (1) Based on the compensation hypothesis, entrepreneurs endowed by lower stocks of human capital should make more use of social support in the start-up period of their businesses. (2) Also based on the compensation hypothesis, entrepreneurs initiating businesses with smaller amounts of financial start-up capital should receive more social support. (3) Based on the compensation and success hypotheses, simple bivariate cross tabulations of social support measures and success indicators should show no or even negative effects of network support. (4) And based on the success hypothesis, after controlling for human capital of the founders and start-up capital of the new businesses positive influences of network support should show up.

Based on these predictions our empirical section is divided into two parts. First, we test the compensation hypotheses (1) and (2). We do this by regressing social support on human and financial capital. Second, the success hypotheses (3) and (4) are tested by investigating whether social support received from ones personal network increases the success of the firm.

III. Data, variables, and methods

III.1. *The Munich Founder Study*

The data we use are part of the "Munich Founder Study". This study is based on interviews, conducted at the beginning of 1990, with a random sample of 1,849 business founders. The founders interviewed had registered for a new business in 1985/86 in Munich and Upper Bavaria (Germany) at the local Chamber of Commerce. Since our total population is confined to businesses administered by the Chamber of Commerce, crafts, agricultural businesses, physicians, architects, and lawyers are not part of the data set.

Based on the total population of more than 30,000 business registrations in 1985/86 in Munich and Upper Bavaria, a stratified random sample of about 6,000 businesses was drawn. Besides a size indicator (differentiating between

small tradesmen and businesses in the commercial register) and a rough type of industry measure (differentiating between manufacturing/construction, wholesale and retail trade, and businesses in the service sector) the main stratification criterion was whether the firms were still in existence or not. Deregistered firms were overrepresented in the sample because we expected the response rate to be lower in this group. As far as we report descriptive results in our empirical analyses (univariate statistics and cross tabulations), we will use the reweighted data set (the weighting accounts for the stratification of the sample which was based on information contained in the official registration data). For multivariate analyses, however, we refer to the unweighted data because there is no consensus in the statistical literature whether weighting pays off in multivariate modelling.

In the first step of our study, we had to update the addresses of the 6,000 founders of the sample. The addresses that the Chamber of Commerce provided to us had the status of 1985/86 when the founders registered for their businesses. The next step concerned the problem to motivate the founders to participate in the study. As already mentioned above, 1,849 interviews could finally be conducted. Based on the 6,000 addresses of the sample, this means a response rate of 31% – at first glance a moderate result. However, not all business registrations become "real businesses". For nearly 20% of our sample of 6,000 founders, we could observe that there was no economic activity at all. Therefore, our net response rate is about 39%. The following analyses are based on 1,710 firms because we omitted cases founded before 1985 and after 1986. 32% of these founders had given up their business until the date of the survey in the first months of 1990.

The question program of our interviews was very broad and required an average interview time of nearly one hour. The first part of the interview concerned start-up characteristics of the firm and its development over time, the second part dealt with individual attributes and networking activities of the founder (for more details on the Munich Founder Study, see Brüderl et al., 1996).

III.2. *Network support variables*

The variables of primary interest for our analyses are those measuring the amount of network support entrepreneurs received. Using different questions of our interviews, we constructed four support variables. Since most of our questions refer to the family network, three support variables (1, 3, and 4) measure support received from the family. Only variable (2) measures support received from non-family networks.

(1) *Support from strong ties:* To get an impression about the role of social contacts in the start-up period of new businesses, participants of our study were asked on a scale ranging from 1 (no support) to 5 (full support) whether they received any support from different kinds of people. Under the heading of "strong ties support" we subsume support from spouse/life-partner, parents, friends, and relatives. 54% of our founders declared that they received support from their spouse or life-partner (codes 4 and 5 on the scale); and this percentage goes up to 68% if we look only at those living with a spouse or life-partner at time of founding. Corresponding support percentages for parents are 15%, friends 10%, and relatives 7%. To have a summary measure of the amount of support from strong ties, we added these four items, divided by 4 (the number of items), and thus got an index ranging from 1 to 5 (mean: 2.1).

(2) *Support from weak ties:* Referring to the item battery and question format already used for our strong ties measure, we qualify "weak ties support" as support from business partners, acquaintances, former employers, and former co-workers. 18% of our respondents received support from business partners, 8% from acquaintances, 6% from former employers, and 5% from former co-workers. Again, we constructed an additive index with these four items (mean: 1.5).

(3) *Active help from spouse:* Whereas our question exploring support from strong and weak ties did not specify the content of this support, for those founders having a spouse or life-partner we investigated the type of support in more detail. On a scale from 1 to 5, one item asked for the amount of active help and work the spouse or life-partner invested in the new business in the start-up period. 34% of all respondents received such active help

(codes 4 and 5 on the scale, mean: 2.6); and this percentage climbs to 48% for the subgroup of founders having a spouse or life-partner (mean: 3.2).

(4) *Emotional support from spouse:* In addition to active work of spouse/life-partner, three other 1–5 items aimed at socio-emotional support, a "soft" type of contribution. Based on the total sample, 60% of our founders directly agree that they received emotional support from their partner; also 60% say that they could speak about all problems and difficulties of the firm with their partner; and 58% state that there was a consensus in the family about the opening of the business. Confined to founders living with a spouse or life-partner, these percentages are 83%, 83%, and 81%. Again, based on these three items we constructed an additive index (mean for all respondents: 3.4, mean for respondents having a spouse/life-partner: 4.4).

III.3. *Success variables*

To investigate the success hypotheses we need a measure of "organizational success". Based on a broad series of success indicators offered by the Munich Founder Study, we selected – stimulated by results of factor analysis (Brüderl et al., 1996: Chapt. V.3) and in line with much previous research (e.g., Klandt, 1984, 97 pp.; Hunsdiek and May-Strobl, 1986, 24 pp.; Picot et al., 1989, 73 pp.) – three such measures: survival, employment growth, and sales growth. Survival can be seen as minimum criterion of success, and death as "final manifestation of unsuccessful organizational performance" (Carroll, 1987, p. 44); employment growth is important because of the widespread hope that new businesses create new jobs (e.g., Birch, 1987); and sales growth highly correlates with other, more sophisticated measures of the financial development of a new firm (Albach et al., 1985, 123 pp.).

To be able to use one type of model for our multivariate analyses, we constructed all three success measures as simple dummy variables. Survival means that the firm did not stop its operation within the first three years after founding. 74% of our sample firms belong to this more or less lucky group. Our employment and sales growth measures are confined to this group of survivors. A firm is coded as having an employment growth if it increased its number of employees within the first three years of existence (independent of the amount of increase). In the light of this indicator, 28% of our surviving firms are successful. The sales growth measure also pertains to the first three years, and a firm is qualified as growing, if its average sales growth was more than 10% each year. 47% of all survivors had a sales growth specified in this way.

III.4. *Statistical methods*

Since our four support variables are indices ranging from 1 to 5, we can use simple OLS regressions to investigate the effects of human and financial capital on social support. Our three success measures are dichotomous and an appropriate model for this kind of data is probit regression. Here we encounter a methodological problem: our two growth measures are only defined over a selected sample (those firms that survived). Therefore, single equation probits would yield biased results. To remedy this sample selection problem we used bivariate probit models (Greene, 1995, Chap. 22), where the survival and a growth equation are estimated jointly. In addition, the error terms of the two equations are allowed to correlate. This procedure takes account of the sample selection problem for the growth equations.

IV. Empirical results

IV.1. *Network compensation hypothesis*

The network compensation hypothesis predicts that business founders with a less favourable human capital profile and with restricted financial resources try harder to activate their social ties and receive more support out of their networks. We can test this hypothesis by investigating effects of human capital indicators of the founder and start-up capital of the firm on our network support measures.

For the measurement of founders' human capital we will use five variables: years of schooling, years of work experience, industry-specific experience, self-employment experience, and management experience. Years of schooling

measures general education and occupational training (e.g., an apprenticeship or an university degree) of the founder; sample mean is 13.1 years. Years of work experience – with a mean of 14.5 years – was constructed from the complete career history of the founder; all episodes outside the labour market (unemployment, military service, household work, etc.) do not count as work experience. Prior industry-specific, self-employment, and management experience are dummy variables; they show whether the founder did have prior work experience in the new firm's industry, whether the founder did have earlier self-employment spells in his or her biography, and whether the founder was a supervisor of other people in one or more of his or her prior jobs. 56% of all founders started their businesses with industry-specific experience, 29% with self-employment experience, and 52% with management experience. Start-up capital of the firm is measured by a single variable, namely the amount of money invested in the new business; its mean is 82,500 DM (German Marks). Because this variable is highly skewed to the right, we will use its natural logarithm (mean: 7.1).

Besides these independent variables which directly are tailored to the compensation hypothesis, we include the founder's gender and nationality as two additional variables. Based on the assumption that female and Non-German founders are more or less disadvantaged groups, we would expect that they resort more often to social support. Female founders make up 32%, and Non-German founders 6% of our sample. As "Non-Germans" we did not simply qualify those not having a German passport (10% of our respondents), but only those who – according to assessments given by the interviewers on a separate sheet of paper – can be recognized as being of Non-German origin (e.g., based on their language skills).

To estimate the effects of gender, nationality, human capital and financial capital on the amount of network support, we use OLS-regression models. The results of this exercise are shown in Table I. The models for support from strong and weak ties refer to all respondents, whereas the models for help and emotional support from spouse/life-partner are restricted to those living with a spouse or life-partner.

Beginning with gender, we can see in Table I that female founders receive more support from strong ties, more active help from their spouse/life-partner, and more emotional support from their spouse/life-partner. Except for support from weak ties, this is in line with our expectation. Concerning nationality, however, the expected positive effects do not show up. Only one effect seems worth mentioning, namely that Non-German founders receive less support from weak ties (business partners, acquaintances, former employers, former co-workers). This is understandable, given the lower opportunity of Non-Germans for building up weak ties. If we compare

TABLE I
Human capital of founder, start–up capital of firm, and network support (unstandardized effects of OLS-regressions)

Covariates	Means of covariates	Support from strong ties	Support from weak ties	Active help from spouse	Emotional support from spouse
Female founder	0.32	0.089 (1.90)	–0.024 (0.57)	0.341* (2.92)	0.316* (4.31)
Non-German founder	0.06	–0.007 (0.07)	–0.158 (1.87)	0.044 (0.18)	0.103 (0.66)
Years of schooling	13.11	–0.019* (2.65)	0.012* (2.37)	–0.085* (4.76)	–0.027* (2.37)
Years of work experience	14.53	–0.009* (4.29)	–0.010* (5.02)	0.014* (2.67)	0.002 (0.67)
Industry-specific experience	0.56	0.061 (1.40)	0.122* (3.17)	–0.263* (2.46)	–0.056 (0.83)
Self-employment experience	0.29	–0.134* (2.96)	–0.129* (3.23)	–0.103 (0.96)	–0.110 (1.63)
Management experience	0.52	–0.055 (1.26)	0.053 (1.39)	0.104 (0.98)	–0.014 (0.21)
Start-up capital (natural log)	7.08	0.024* (5.38)	0.008 (1.94)	0.071* (6.52)	0.026* (3.86)
R^2		3.9%	4.1%	7.4%	3.7%
No. of cases		1672	1671	1226	1225

* Statistically significant at 5%-level. *t*-values in parentheses. Reference group: male founder, German founder, no industry-specific experience, no self-employment experience, no management experience.

in an additional bivariate analysis Germans and Non-Germans on all single items constituting our support indices, we can find in none of these 12 comparisons any significant difference. So, at least in our sample there are no hints that "ethnic entrepreneurs" mobilize their network resources more often and try to compensate via social networking.

The compensation hypothesis predicts negative effects of our human capital indicators. Looking over the coefficients in Table I, however, the picture turns out to be inconclusive. There is some confirmation regarding support from strong ties, but not for the other three support measures. Founders with more years of schooling receive less support from strong ties and less help and emotional support from their spouse/life-partner, but more support from weak ties; self-employment experience is consistently connected with negative effects; and for the other three human capital variables (years of work experience, industry-specific experience, management experience) the pattern of effects is mixed. Nevertheless, out of 11 significant human capital coefficients 8 have the expected negative signs, and so there might be some truth in the statement that certain groups of founders try to compensate deficits of human capital by resorting to network support.

Concerning the role of a restricted financial basis of a new firm, our coefficients in Table I fully contradict the compensation hypothesis. The hypothesis would predict negative effects of the amount of start-up capital, but all effects are positive. Thus, founders with restricted amounts of start capital do not mobilize more social support.

If we remember our arguments in Section II, we have to concede that our test procedure has an important drawback. What we measure with our support variables is the outcome, and we argued in Section II that this outcome is the result of the endeavour to mobilize network support on the one hand, and of the opportunity structure (given by general network characteristics) on the other hand. The compensation hypothesis primarily postulates a stronger endeavour to activate social resources, and thus a more appropriate test should control for the opportunity structure what (lacking the necessary data) we did not do in our analysis. This missing control of the opportunity structure may explain, for example, why better educated founders receive more support from weak ties. The same argument applies to the capital effects: Founders with a broad network have simply more opportunities to raise start-up capital. Thus, our tests of the compensation hypothesis are only preliminary.

IV.2. *Network success hypothesis*

Bivariate results

Since the compensation hypothesis did not find confirmation in the preceding section, we should modify our hypothesis (3) that a bivariate analysis will show no or even negative effects of network support on success of newly established businesses. Instead, following the network success hypothesis, we would expect already on the bivariate level that entrepreneurs receiving more social support are more successful.

For the cross tabulation of our success measures with our support variables, we grouped the support indices into three categories: low, medium, and high support. Table II summarizes the percentages of the resulting 12 cross tabulations, using the three success measures as dependent and the four support measures as independent variables. We can see in this table that network support seems to pay off. In all 12 subtables those entrepreneurs receiving high support/help are more successful than those receiving low support/help, and in 8 subtables percentage differences among the three groups are significant at the 5% level. These bivariate results can be seen as a first, surprisingly clear and consistent confirmation of the network success hypothesis.

A baseline model for the success of new businesses

Now, we should be aware that the success of new businesses depends on a broad range of factors and that network support is only one part of the picture. For a more convincing and stringent test of the network success hypothesis, it is necessary to have a model that controls for some basic influences on success of new businesses. To prepare for a multivariate test of the network success hypothesis, in this section we will present such a "baseline model".

Overviewing prior theoretical and empirical research on the performance of small businesses (e.g., Cochran, 1981; Carroll, 1987, pp. 28–36;

TABLE II
Network support and the success of new businesses (percentages)

Network support variables	Survival	Employment growth	Sales growth
Support from strong ties			
Low	68.2	28.2	45.1
Medium	72.6*	25.8	42.8*
High	78.0	30.8	54.8
Support from weak ties			
Low	72.6	23.7	40.7
Medium	73.0	32.8*	52.0*
High	78.5	33.1	60.5
Active help from spouse			
Low	67.5	25.9	43.5
Medium	78.9*	33.4	54.0*
High	79.2	27.5	48.2
Emotional support from spouse			
Low	65.9	23.8	46.0
Medium	75.6*	35.2*	49.3
High	77.3	26.3	47.3

* Differences between groups are statistically significant at 5%-level.

Hannan and Freeman, 1989; Bates, 1990; Brüderl et al., 1992; Müller-Böling and Klandt, 1993; Audretsch, 1995), three groups of factors affecting success or failure of new firms can be extracted: (1) individual characteristics of the founding person, (2) characteristics of the new firm itself, and (3) characteristics of the environment of the firm.

Concerning characteristics of the founding person, we will include gender, nationality, and the five human capital variables that we have already introduced in Section IV.1. Concerning characteristics of the new firm itself, the so-called liability of newness (younger firms are more failure-prone) and the liability of smallness (smaller firms have lower chances of success) are the most prominent hypotheses (for these hypotheses, see Freeman et al., 1983; Brüderl and Schüssler, 1990). Concerning the "newness" of a firm, we consider one indicator, namely whether the firm is a newcomer or a follower business. Newcomer businesses are established by the founder from scratch, i.e. the founder created the firm de novo. Follower businesses are new in a legal sense, but follow in the footsteps of a previously existing firm, i.e. the founder enters a business that was already in operation. 76% of our businesses are newcomers, 24% followers. "Smallness" and start-up size will be captured by four variables in our baseline model: start-up capital (already introduced in Section IV.1), number of employees in the first year, sales volume in the first year, and legal form. The average number of employees (founder included) at the beginning was 2.2 full-time workers, and the average sales volume 410,000 DM. Like with start-up capital, we use the natural logarithms of these variables (means: 0.24 and 11.17). The legal form of a business distinguishes between firms not registered with the commercial register, i.e. small tradesmen (Kleingewerbetreibende), and firms registered with the commercial register (Handelsregisterfirmen). If a firm meets certain industry-specific size criterion (as defined by German law), it must be registered both with the Chamber of Commerce and with the commercial register. Moreover, all limited liability commercial partnerships (GmbH) have to register with the commercial register. 20% of our businesses are enlisted in the commercial register.

Turning finally to the environmental characteristics, it is clearly difficult in a survey to collect reliable information about "the environment" of new businesses. For instance, competitive intensity, market concentration, the innovation rate, and the extent of scale economies are all known to affect the success of new entrants (Hannan and Freeman, 1989; Audretsch, 1995). However, our survey data do not give us reliable information on these environmental variables. Therefore, the only thing we can do with our data is to control for environmental effects via industry dummies. It should be clear that these industry effects are not "causal", but only reflect the effects of the above mentioned environmental characteristics. Our industry classification differentiates 11 founding branches (weighing detail against the increasing number of parameters): manufacturing 4%, construction 1%, retail trade 25%, wholesale trade 11%, sales intermediaries 5%, transportation 9%, insurance 7%, restaurant businesses 8%, education/publishing 3%, consultation 18%, and other services 9%. As is common practice we choose the biggest industry – retail trade – as reference group.

As mentioned above we use bivariate probit

models to estimate the effects of this set of covariates on our three success measures. Probit coefficients, however, are not easy to interpret. To have a more convenient interpretation we transformed our probit coefficients into marginal effects (probability changes) at the mean of all covariates. These marginal effects are presented in Table III. To give an example, let us look at the gender effects: Compared with businesses of male founders, businesses of female founders have a 2.5 percentage point higher probability of survival, a 15.2 percentage point lower probability of an employment growth, and a 12.9 percentage point lower probability of a sales growth (at the mean of all other covariates).

Some effects in Table III are in line with "conventional wisdom", others are not. Because our focus will be on possible social support effects (next section), it may suffice to rush through Table III very quickly (much more details can be found in Brüderl et al., 1996): Female founders show much lower growth dynamics, but their survival probability is not lower. Businesses initiated by Non-Germans do not have significant disadvantages. Strong effects, in particular for survival, show the human capital variables. Founders with more years of schooling start less failure-prone businesses, but their firms do not have a stronger growth potential. Older founders (measured by years of work experience) are more conservative and cautious entrepreneurs; their businesses have better survival chances, but they are less dynamic. Industry-specific experience is the most important human capital variable; founders lacking this experience clearly have restricted prospects. Prior self-employment and management experience do not pay off what contradicts usual expectations. Although follower businesses, compared with

TABLE III
Baseline models for the success of new businesses (marginal effects of bivariate probit models)

Covariates	Means of covariates	Survival	Employment growth	Sales growth
Female founder	0.32	0.025 (0.98)	–0.152* (3.70)	–0.129* (3.08)
Non-German founder	0.06	–0.044 (0.85)	–0.050 (0.58)	0.055 (0.63)
Years of schooling	13.11	0.017* (3.97)	0.001 (0.12)	–0.015* (2.31)
Years of work experience	14.53	0.004* (3.42)	–0.006* (3.34)	–0.007* (3.61)
Industry–specific experience	0.56	0.104* (4.36)	0.092 (1.92)	0.125* (2.49)
Self-employment experience	0.29	–0.033 (1.24)	–0.007 (0.19)	–0.027 (0.69)
Management experience	0.52	0.011 (0.46)	–0.053 (1.55)	–0.005 (0.13)
Follower business	0.24	0.053 (1.82)	–0.109* (2.80)	–0.173* (4.16)
Start-up capital (natural log)	7.08	0.007* (2.51)	0.011* (2.53)	0.016* (3.07)
No. of employees in first year (natural log)	0.24	0.046* (3.08)	0.031 (1.63)	0.018 (0.83)
Sales volume in first year (natural log)	11.17	–	–	–0.047* (6.47)
Registered in commercial register	0.20	0.185* (5.38)	0.108* (2.07)	0.053 (0.99)
Industry: manufacturing	0.04	0.234* (5.69)	0.068 (1.19)	–0.010 (0.17)
Industry: construction	0.01	0.210* (3.29)	–0.061 (0.72)	0.004 (0.04)
Industry: wholesale trade	0.11	0.008 (0.20)	0.009 (0.17)	0.058 (0.96)
Industry: sales intermediaries	0.05	–0.013 (0.23)	0.064 (0.76)	0.023 (0.25)
Industry: Transportation	0.09	–0.076 (1.61)	–0.047 (0.58)	–0.066 (0.85)
Industry: insurance	0.07	–0.018 (0.36)	–0.137 (1.35)	–0.140 (1.07)
Industry: restaurant	0.08	–0.061 (1.28)	–0.116 (1.15)	–0.162 (1.56)
Industry: education/publishing	0.03	0.089 (1.27)	–0.102 (1.00)	0.026 (0.25)
Industry: consultation	0.18	0.035 (0.91)	0.093 (1.64)	0.065 (1.01)
Industry: other services	0.09	0.020 (0.41)	–0.078 (1.08)	–0.117 (1.59)
Pseudo-R^2		15.8%		16.7%
No. of cases		1674	1187	978

* Statistically significant at 5%-level. *t*-values in parentheses. Pseudo-R^2 gives the relative Likelihood improvement compared to the model without covariates. Reference group: male founder, German founder, no industry-specific experience, no self-employment experience, no management experience, newly established business, not registered in commercial register, retail trade.

newcomer businesses, have a certain advantage with respect to survival, their potential for future growth is limited. As in many other studies, the liability of smallness is confirmed impressively: higher start-up capital, a registration in the commercial register and more employees at time of founding improve the probability of success. Finally, concerning industry, businesses in the manufacturing sector are top, whereas foundings in transportation, insurance, and restaurant businesses are obviously operating in a "tough" environment.

Multivariate results

Starting from this baseline, we can now introduce the support variables into this model. Because our social support indices partly capture similar aspects (the bivariate correlation of active help and emotional support from spouse/life-partner, for example, is 0.70), we added them separately to the baseline models of Table III. Furthermore, to have bivariate and multivariate results in a comparable fashion, we used the same groupings like in Table II. This means that each support variable enters the baseline model as two dummies, with low support/help being the reference group. The marginal effects of these dummies are given in Table IV. Again, let us give an example of how to read this table: After controlling for the complete set of covariates of the baseline model, support from strong ties on a medium level (as compared to a low level) improves survival chances by 5.6 percentage points (at the mean of all covariates); support from strong ties at a high level is connected with a 9.3 percentage point increase of survival.

Fully in accordance with the network success hypothesis, all 24 coefficients are positive, and 8 of them are statistically significant. The statistical significant coefficients indicate that high network support increases the probability of survival and growth by 8 to 18 percentage points. In addition, the magnitude of many non-significant coefficients is also seizeable. Indeed, especially if we compare this finding with inconclusive empirical evidences of previous studies (see Section II), this can be qualified as a very encouraging result for the network success hypothesis.

Besides this overall picture, the coefficients in Table IV give another important hint: Contrary to Granovetter's (1974, 1983) well-known "weak ties hypothesis", in the context of entrepreneurship and small business formation strong ties and family support seem to be crucial resources. We observe the strongest and most consistent effects for active help from the spouse or life-partner. Support from strong ties shows more convincing effects than our support from weak ties measure. And even the "soft measure" of emotional support from the spouse/life-partner has surprisingly clear effects. This demonstrates that in particular support from the family network increases success. Support from the outside network shows much less effect. Nevertheless, we agree that more fine-grained measures especially of weak ties are necessary for a more appropriate test of this special sub-hypothesis.

TABLE IV
Network support and the success of new businesses (marginal effects of bivariate probit models controlling for all covariates of the baseline model)

Network support variables	Survival	Employment growth	Sales growth
Support from strong ties			
Medium	0.056*	0.037	0.033
	(1.97)	(0.88)	(0.71)
High	0.093*	0.068	0.178*
	(3.04)	(1.46)	(3.21)
Support from weak ties			
Medium	0.005	0.019	0.075
	(0.19)	(0.53)	(1.92)
High	0.058	0.046	0.138*
	(1.69)	(1.00)	(3.63)
Active help from spouse			
Medium	0.105*	0.068	0.091
	(3.57)	(1.57)	(1.88)
High	0.093*	0.018	0.095*
	(3.43)	(0.45)	(2.23)
Emotional support from spouse			
Medium	0.017	0.074	0.045
	(0.58)	(1.78)	(0.99)
High	0.075*	0.065	0.078
	(2.77)	(1.51)	(1.65)

* Statistically significant at 5%-level. *t*-values in parentheses. The support variables are added separately to the models of Table III. Reference group in each case is the low support group.

V. Conclusion

Taken together, our results can serve as an encouragement for the "network approach to entrepreneurship". The network success hypothesis stating that support from the personal network of a founder improves survival and growth of newly established businesses was valid in bivariate and multivariate analysis. Support from strong ties seems to be more important than support from weak ties. On the other hand, our network compensation hypothesis stating that entrepreneurs compensate shortfalls of human and financial capital by resorting to network support, did not find confirmation. At best we can speak of a partial confirmation with respect to human capital. The hypothesis that founders endowed by lower stocks of human capital try harder to mobilize social support from their (presumably restricted) social network merits further investigation.

We do not want to finish this paper without some remarks on its restrictions and problems. The design of our study implies some restrictions: (1) We could not look at organizational networks, because we gathered no information on these ties. (2) We said nothing about the network founding hypothesis. For this, one would need detailed information on the founding process. (3) Our data are confined to one German region and this obviously raises the question of the generalizability of our results. To overcome restrictions (1) and (2) one would need to develop different research designs. Restriction (3) might be a stimulus for other researchers to gather similar data.

However, the main problem from our point of view concerns our measurement of the networking variables. We observed one outcome of networking activities, the amount of social support finally received, but ignored the ongoing processes and endeavours to mobilize network resources, and the corresponding opportunity structure that should be described by general characteristics of the network in which an entrepreneur is embedded. Network size, network density or network diversity are examples of such network characteristics, and their measurement can best be handled by using a "name generator" which is a well-known instrument in general network analysis. In an empirical study investigating success of business start-ups in East Germany, meanwhile we have developed and used such a name generator. Regrettably, it will take some time before we can observe our dependent variable, namely success or failure of the 750 firms making up our East German panel. The results presented in this paper stimulate our hope that we are on the "right track" with the network approach to entrepreneurship.

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References

Albach, Horst, Kurt Bock and Thomas Warnke, 1985, *Kritische Wachstumsschwellen in der Unternehmensentwicklung*, Stuttgart: Poeschel.

Aldrich, Howard E., 1989, 'Networking Among Women Entrepreneurs', in Oliver Hagan, Carol Rivchun and Donald Sexton (eds.), *Women-Owned Businesses*, New York: Praeger, pp. 103–132.

Aldrich, Howard E., Pat Ray Reese and Paola Dubini, 1989, 'Women on the Verge of a Breakthrough? Networking Among Entrepreneurs in the United States and Italy', *Entrepreneurship and Regional Development* **1**, 339–356.

Aldrich, Howard E., Ben Rosen and William Woodward, 1987, 'The Impact of Social Networks on Business Foundings and Profit: A Longitudinal Study', in N. Churchill, J. Hornaday, O. J. Krasner and K. Vesper (eds.), *Frontiers of Entrepreneurship Research*, Wellesley, MA: Babson College, pp. 154–168.

Aldrich, Howard E. and Cathrine Zimmer, 1986, 'Entrepreneurship through Social Networks', in Howard E. Aldrich (ed.), *Population Perspectives on Organizations*, Uppsala: Acta Universitatis Upsaliensis, pp. 13–28.

Audretsch, David B., 1995, *Innovation and Industry Evolution*, Cambridge, MA: MIT Press.

Bates, Timothy, 1990, 'Entrepreneur Human Capital Inputs and Small Business Longevity', *Review of Economics and Statistics* **72**, 551–559.

Bates, Timothy, 1994, 'Social Resources Generated by Group Support Networks May Not Be Beneficial to Asian Immigrant-Owned Small Businesses', *Social Forces* **72**, 671–689.

Birch, David L., 1987, *Job Creation in America*, New York: Free Press.

Birley, Sue, 1985, 'The Role of Networks in the

Entrepreneurial Process', *Journal of Business Venturing* **1**, 107–117.
Bögenhold, Dieter, 1989, 'Die Berufspassage in das Unternehmertum', *Zeitschrift für Soziologie* **18**, 263–281.
Bögenhold, Dieter and Udo Staber, 1994, *Von Dämonen zu Demiurgen? Zur (Re-) Organisation des Unternehmertums in Marktwirtschaften*, Berlin: Akademie Verlag.
Boissevain, Jeremy, Jochen Blaschke, Hanneke Grotenbreg, Isaac Joseph, Ivan Light, Marlene Sway, Roger Waldinger and Pnina Werbner, 1990, 'Ethnic Entrepreneurs and Ethnic Strategies', in Roger Waldinger, Howard E. Aldrich and Robin Ward (eds.), *Ethnic Entrepreneurs*, Newbury Park, CA: Sage, pp. 131–156.
Brüderl, Josef, Peter Preisendörfer and Rolf Ziegler, 1992, 'Survival Chances of Newly Founded Business Organizations', *American Sociological Review* **57**, 227–242.
Brüderl, Josef, Peter Preisendörfer and Rolf Ziegler, 1996, *Der Erfolg neugegründeter Betriebe*, Berlin: Duncker & Humblot.
Brüderl, Josef and Rudolf Schüssler, 1990, 'Organizational Mortality: The Liabilities of Newness and Adolescence', *Administrative Science Quarterly* **35**, 530–547.
Burt, Ronald S., 1992, *Structural Holes: The Social Structure of Competition*, Cambridge, MA: Harvard University Press.
Carroll, Glenn R., 1987, *Publish and Perish*, Greenwich, CT: JAI Press.
Carsrud, Alan L., Connie Marie Gaglio and Kenneth W. Olm, 1987, 'Entrepreneurs – Mentors, Networks, and Successful New Venture Developments: An Exploratory Study', *American Journal of Small Business* **13** (Fall), 13–18.
Cochran, A.B., 1981, 'Small Business Mortality Rates: A Review of the Literature', *Journal of Small Business Management* (October), 50–59.
Coleman, James S., 1990, *Foundations of Social Theory*, Cambridge, MA: Harvard University Press.
Donckels, Rik and Johan Lambrecht, 1995, 'Networks and Small Business Growth: An Explanatory Model', *Small Business Economics* **7**, 273–289.
Dubini, Paola and Howard E. Aldrich, 1991, 'Personal and Extended Networks are Central to the Entrepreneurial Process', *Journal of Business Venturing* **6**, 305–313.
Freeman, John, Glenn R. Carroll and Michael T. Hannan, 1983, 'The Liability of Newness: Age Dependence in Organizational Death Rates', *American Sociological Review* **48**, 692–710.
Granovetter, Mark S., 1974, *Getting a Job*, Cambridge, MA: Harvard University Press.
Granovetter, Mark S., 1983, 'The Strength of Weak Ties: A Network Theory Revisited', in Randall Collins (ed.), *Sociological Theory*, San Francisco, CA: Jossey-Bass, pp. 201–233.
Greene, William H., 1995, *LIMDEP, Version 7.0, User's Manual*, Bellport, NY: Econometric Software.
Hannan, Michael T. and John Freeman, 1989, *Organizational Ecology*, Cambridge, MA: Harvard University Press.
Hébert, Robert F. and Albert N. Link, 1989, 'In Search of the Meaning of Entrepreneurship', *Small Business Economics* **1**, 39–49.
Hunsdiek, Detlef and Eva May-Strobl, 1986, *Entwicklungslinien und Entwicklungsrisiken neugegründeter Unternehmen*, Stuttgart: Poeschel.
Klandt, Heinz, 1984, *Aktivität und Erfolg des Unternehmensgründers*, Bergisch-Gladbach: Eul.
Light, Ivan and Parminder Bhachu (eds.), 1993, *Immigration and Entrepreneurship*, New Brunswick, NJ: Transaction.
Light, Ivan and Stavros Karageorgis, 1994, 'Ethnic Economy', in Neil J. Smelser and Richard Swedberg (eds.), *The Handbook of Economic Sociology*, New York, NY: Princeton University Press, pp. 647–671.
Müller-Böling, Detlef and Heinz Klandt, 1993, 'Unternehmensgründung', in Jürgen Hauschildt and Oskar Grün (eds.), *Ergebnisse empirischer betriebswirtschaftlicher Forschung*, Stuttgart: Schäffer-Poeschel, pp. 135–178.
Nohria, Nitin, 1992, 'Information and Search in the Creation of New Business Ventures', in Nitin Nohria and Robert Eccles (eds.), *Networks and Organizations: Structure, Form, and Action*, Boston, MA: Harvard Business School Press, pp. 240–261.
Picot, Arnold, Ulf-Dieter Laub and Dietram Schneider, 1989, *Innovative Unternehmensgründungen*, Berlin: Springer.
Powell, Walter W. and Laurel Smith-Doerr, 1994, 'Networks and Economic Life', in Neil J. Smelser and Richard Swedberg (eds.), *The Handbook of Economic Sociology*, New York, NY: Princeton University Press, pp. 368–402.
Sanders, Jimy M. and Victor Nee, 1996, 'Immigrant Self-Employment: The Family as Social Capital and the Value of Human Capital', *American Sociological Review* **61**, 231–249.
Uzzi, Brian, 1996, 'The Sources and Consequences of Embeddedness for the Economic Performance of Organizations: The Network Effect', *American Sociological Review* **61**, 674–698.
Waldinger, Roger, Howard E. Aldrich and Robin Ward (eds.), 1990, *Ethnic Entrepreneurs*, Newbury Park, CA: Sage.
Yoon, In-Jin, 1991, 'The Changing Significance of Ethnic and Class Resources in Immigrant Business: the Case of Korean Immigrant Businesses in Chicago', *International Migration Review* **25**, 303–331.
Zimmer, Catherine and Howard E. Aldrich, 1987, 'Resource Mobilization through Ethnic Networks', *Sociological Perspectives* **30**, 422–445.