

SOCIAL CAPITAL AND THE MODERN INCUBATOR: A COMPARISON OF IN –GROUP AND OUT-GROUP SOCIAL NETWORKS

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ABSTRACT

In the public policy arena, one of the most prevalent components of entrepreneurship promotion consists of the sponsorship of public and university based incubators. Incubators are business support institutions designed to offer an array of services, such as space, infrastructure, advice, training and administrative support meant to accelerate the business start-up process. In a unique research study, we compare two groups of matched Canadian firms – incubated, and non incubated, along dimensions designed to examine the characteristics of the firm owner’s networks. Incubated firm owners reported higher extremes of trust, met more frequently, and demonstrated different network characteristics.

Introduction

Business incubators are organizations whose purpose it is to support the creation and growth of new businesses, by supplying a shared office environment and agglomeration of new and small businesses. It is generally accepted that the first incubator was established as the Batavia industrial center in 1959 in Batavia New York (Lewis, 2002, and Hackett and Dilts 2004). While there were only about 26 incubators in the U.S. in 1984, the National Business Incubation Association (NBIA) estimates growth to over 1100 business incubators in the USA and 150 in Canada (NBIA, 2006 and CABI, 2006). Business incubation also became a widely spread phenomena world-wide during the early 1990s. By 2001, there were about 850 business incubators in Europe (European Commission, 2001) and approximately 120 in Canada. There are now business incubators in Algeria (Casablanca techno park), Iran (Istafan science and technology town), Israel (NAIOT; ITEK;TEIC) and Malaysia (MSU Business Incubator).

Several factors have fuelled this rapid expansion of business incubators. The primary driver was probably the increased interest in the role of new and small firms in the job creation process during the 1980s. As a result of a series of studies showing the importance of new and small businesses for job creation (Birch, 1979; Storey, 1983), many governments have turned their attention from large businesses to increasingly focus their public assistance and support for new and small ventures. The perception of the importance of entrepreneurship has rarely been as important as today. A larger proportion of the general population engages in entrepreneurship now, than ever before (Gartner & Shane, 1995). There is a growth of entrepreneurship education, entrepreneurship research, and entrepreneurship faculty (Katz, 1991). Some of the specific promotion efforts of governments include establishing special small business loans, providing subsidies or grants to assist with employment, rent, and business counseling, and supporting small business agencies. The focus on increasing and improving the population of small and new high technology firms has contributed to an increase in science parks and business incubators (Phan, Siegel and Wright, 2005). Public and private universities have also played an active role in supporting incubators, believing them to be vehicles for commercializing science. Technology incubators located on University campuses demonstrate an increasing aspiration to yield regional economic development as part of the University mission.

Research on Incubation

Early studies of incubators predominantly focused on case studies defining the phenomena, and establishing best practices of incubators. Due to the wide variety of models employed, there has also been interest in creating a typology of business incubators (Hackett and Dilts, 2004). A large number of studies (Smilor, 1987; Campbell et al., 1988; Latona and LeHere, 1989; Bauer and Hannig, 1992; Rice, 1992; Lichtenstein, 1992; Mian, 1994; OECD, 1997; Hansen, Nohria and Berger, 2000) have tried to identify the features of successful incubation programs. In many cases this research has centered on either a single case study or a sample of incubators which 'are generally viewed as being successful'. These examples of research represent a common problem in entrepreneurship – sampling on the dependent variable, or examining a population with a success bias. Such study leads to over estimating success, the failure to identify riskier strategies and mistakes, and an inability to learn from failure (e.g. learning from the many incubators that have failed). Related to this problem, some of the studies may also be positively biased towards business incubation (Bearse, 1993). Incubator research has also been criticised for being a theoretical (Mian, 1994; Mian, 1996). If the area of incubator-incubation research is to advance in a theoretically meaningful manner, beyond collecting and categorizing simple lists of critical success factors, we must turn our attention away from "what" to factors related to the "how", "why" as well as issues related to the context. (Hackett and Dilts, 2004).

While much attention has been devoted to the description of incubator facilities, less attention has been focused on the incubatees (Hackett and Dilts, 2004). It has not been conclusively proven that incubator assistance make a significant different to a firm's performance compared to the performance of a comparable company growing up outside an incubator (Gaynor and Albert, 2001; Hackett and Dilts, 2004).

There are few studies that investigate the relative performance of organizations founded within business incubators in relation to organizations founded outside of business incubators. Westhead, 1997 and Westhead and Storey, 1994, are notable exceptions. One reason for the lack of such study is that incubators are, in many ways, political organizations. They appeal to public funds on the basis of their accomplishments, and are thus less prone to describe failures. While failure in the business world commands some measure of respect for the learning that has occurred, incubation failures may carry political implications resulting in a decrease or elimination of operating subsidies (Bearse, 1998). Hackett and Dilts (2004), as well as Phan, Siegel and Wright 2003, have observed that incubator studies have historically suffered from weak theoretical frameworks. As a result, no research focusing on incubators has ever been published in a top academic management journal (AMJ, AMR, ASQ, MS; Hackett and Dilts, 2004)

Studying the relative performance of incubatees compared to non-incubatees is very important. Without studying this relationship, it is impossible to access if business incubators provide a valuable contribution to new businesses, or not. Measurement is challenging because the full range of data required to implement experimental research designs that squarely address the question "If the incubatee had not been incubated, would there be any difference in the survival rate of new ventures?" is not readily available. Specifically, data on successful incubatees is relatively easy to obtain, because incubators tend to promote their own incubation success stories. Data related to failed incubatees is somewhat more difficult to access, as incubation failures may carry political implications that can result in a decrease or elimination of operating subsidies. Data on the success and failure of comparable non-incubated companies is rarely kept, and has proven quite difficult, if not impossible, to obtain (Bearse, 1998). Despite the common and politically correct belief among incubator managers and government officials that incubators create jobs, early empirical research suggests that incubators and their incubatees are not very good job creators (Campbell and Allen, 1987).

Comparative work examining the practices of incubators in US,UK, and Canada suggests that developing social networks and promoting social capital are the most important roles of incubators (Collinson &

Gregson, 2003). This is congruent with research showing the importance of social capital for entrepreneurs (Davidsson & Honig, 2003; Shane & Cable, 2002). From an entrepreneurial perspective, social capital provides networks that facilitate the discovery of opportunities as well as the identification, collection, and allocation of scarce resources (Birley, 1985; Burt, 2000; Greene, 1997; Shane, 2002; Aldrich, 1999, 1992; Greene & Brown, 1997; Shane & Cable, 2002; Uzzi, 1999). Social capital also assists with the entrepreneurial exploitation process, by providing and diffusing critical information and other essential resources (Aldrich, 1999). Social capital has been shown to provide information leading to capital investment in new ventures (Shane & Cable, 2002). Thus, in this study, we examine the social networks between incubated firms, and similar non-incubated firms in Canada. (Burt, 1992; Burt, 2000).

Definitions and Model

Several different definitions of business incubators exist. Hackett and Dilts (2004) define incubation as follows: “A business incubator is a shared office space facility that seeks to provide its incubatees (i.e. “portfolio-” or “client-” or “tenant-companies”) with a strategic, value-adding intervention system (i.e. business incubation) of monitoring and business assistance (Hackett and Dilts, 2004).” Business incubators are generally perceived as a kind of infrastructure geared to support and nurture the establishment and development of small and medium-sized enterprises (SMEs) (Bollingtoft, 2005). Business incubators are property-based organizations with identifiable administrative centers focused on the mission of business acceleration through knowledge agglomeration and resource sharing (Phan et al 2005). Of note, however, is the emergence of “virtual incubators” that attempt to provide administrative support remotely.

While most definitions are fairly similar, there are some important differences in the types of incubators that exist. In practice, incubators may range from being primarily real estate managers of office space, to organizations that offer a full range of technology development and office services. Our definition of business incubation focuses on the collocation of several new ventures (incubatees) within one limited geographical space, and an organization (incubator) which is purposefully set up to assist and support these ventures. We therefore exclude pure real estate providers and virtual incubators from our definition and our study.

Most previous studies in business incubation have rather narrowly focused at the success of the incubator as such rather than the incubatee. Based on feedback from incubator managers, the National Business Incubation Association 10th Anniversary Survey (1996) identified the most important measures in evaluating performance as: number of jobs created, clients served and companies graduated. The number of start-ups graduated from incubators, amount of commercialized patents, employment growth among start ups and survival has often been used as indicators of an incubators success (Bears, 1998; Udell, 1990, Allen and Weinberg, 1988). Studies focus most often squarely on incubatees and incubators without measuring the performance of similar organizations outside incubators, leaving the studies without a reasonable comparison. Our study focuses at financial performance as key dependent variable. This is done in both incubated and non incubated organizations attempting to disentangle if locating within a business incubator actually improves performance. Because of the extensive governmental resources put into business incubators, such effects should be noticeable. While business incubators still may be efficient in attracting firms to local regions (Markley and McNamara, 1995; Sherman, 1998, 1999; Sherman and Chappell, 1998), it is really their relative impact on performance that should be of key concern for entrepreneurs and entrepreneurship researchers.

A large number of studies have tried to identify the features of successful incubation programs (Smilor, 1987; Campbell et al., 1988; Latona and LeHere, 1989; Bauer and Hannig, 1992; Rice, 1992; Lichtenstein, 1992; Mian, 1994; OECD, 1997; Hansen, Nohria and Berger, 2000). In many cases, the research has centered on either a single case study or a sample of incubators which 'are generally viewed as being successful'. Such studies examine issues such as the identity of the partners, the range of services offered, the networks in place, the mix of companies and the skills of the management team. In one early study, Campbell et al (1988) identified the low cost development and operation as well as the quality of the facility management as features contributing to incubator effectiveness. Latona and LeHere (1989) focused on an aggressive entrepreneurial outreach program, a small business assistance centre, access to sources of capital and an incubator facility. Later, Allen and McCluskey (1990) found that age and size of the facility were important determinants of jobs created and firms graduated, while Rice (1992) highlighted effective intervention as a critical feature.

Incubator variables that were thought to be associated with incubatee success include incubatee selection processes (Kuratko and LaFollette, 1987; Merrifield, 1987), internal incubator network formation (Lichtenstein, 1992), incubator-industry network and incubator support services network density (Hansen et al., 2000; Nowak and Grantham, 2000), incubator manager-incubatee relationships (Autio and Klofsten, 1998; Fry, 1987; Rice, 2002; Sherman, 1999; Udell, 1990), Incubator effectiveness (Sherman and Chappell, 1998), level of incubator, development (Allen, 1988; Sherman and Chappell, 1998), and procedural standardization and policy formalization (Bearse, 1998). However, few of these relationships have been empirically tested. While most practitioner studies find a high rate (usually over 80%) of incubatee survival (Bearse, 1998), other studies report less optimistic (55%) survival rates (Roper, 1999). When examining incubatee survival rates, however, direct comparisons with non-incubated ventures' survival rates may not be meaningful, as the use of selection criteria in admitting incubatees to the incubator results in a selection bias (Sherman and Chappell, 1998).

Thus, no final consensus has emerged regarding conclusively identified successful factors. Martin (1997) identified flexible space, clear entry criteria, a maximum length of stay, management by a business development agency and clear priority placed on networking. However, in the same year the OECD isolated a different series of factors: the objectives and mission, an entrepreneurial manager, focus on cluster based technologies, tenant selection, local and international linkages and diversified sources of finance.

In later studies, the ability to facilitate networking has emerged as a key differentiating factor (Hansen, Nohria and Berger, 2000). This follows work by Lichtenstein (1992) on relationships and entrepreneurship. His major finding was that 'the most important contribution of business incubators to entrepreneurship lies in the opportunities they provide for entrepreneurs to interact and develop relationships with other entrepreneurs, the incubator management and other individuals associated with the incubator'. These studies lead to recommendations on how development programs should be designed to optimize the networking potential.

Although social capital has not been systematically studied in incubator research, the synergism that occurs between tenants and subcontractors and other relations have been noted (Campbell and Allen, 1987, p. 189) as well as the diffusion of best practices and networking toward the identification of capital and university linkages (Karlsson, 2005). Incubated firms have also been shown to have a greater likelihood of establishing formal cooperative relations, both of a commercial and technical nature (Colombo and Delmastro, 2000).

METHODS AND DATA

We collected data from 87 entrepreneurs across Canada, sampling small firms located inside incubators, as well as those never associated with incubators. We compare aspects of social capital related to the origin, quality and frequency of meeting for the individuals entrepreneurs cited as being most important to the success of their companies. We control for a range of other variables between the two groups.

Incubated companies were obtained by scanning the web sites of Canadian incubators, both from the membership list of CABI (Canadian Association of Business Incubators) and supplemented by searching the internet. This provided a list of 894 firms. 704 were called, of which 223 people agreed to conduct the study. 133 surveys were sent mail surveys along with an option to complete the survey online. We received 5 completed written surveys, and 46 completed online surveys, yielding 51 incubated firms in the data set.

For the non-incubated group, we identified a list of 5327 companies made up the initial NAICS code list. NAICS codes were obtained for the incubated companies by entering each "in" company into the Hoover's directory providing corresponding NAICS code for that company. Once we had a list of NAICS codes, we went to the Small Business Centre and asked them to do a search for us by: revenue - 1 million or less small businesses, not large corporations, 10 years of age or less Canada-wide industry: ICT, Life Sciences, Medical, Other, Aero, IT, Info-Languages, KBE, Ag/Bio, Multi-media, Food, Business. Any company that was not Canadian, or had employees over 20 persons, was eliminated. This created a company list containing 2820 firms. Of these, companies which were 10 years old or younger with employees of 15 people or less were called. 318 people were called and 93 agreed to take the survey, or their staff allowed the survey to be forwarded to the individual in question. 40 people completed the survey. Four were rejected as inappropriate, leaving 36 firms.

Results

We began this study by comparing our two groups of start-up – incubated firms and non-incubated firms, on a number of dimensions that examine relationships to social capital. Using a web-based survey product, we first asked the entrepreneurs to provide information on a range of control variables, including their education, ownership, size, managerial and working experience, wealth, and income. Due to the brevity of this paper, we do not address issues relating to those findings. In a section designed to measure social capital, we asked the entrepreneurs to name the five most important individuals to their firm, either by name, pseudonym, or with initials, as follows: *“In your organization, there have probably been other people besides yourself that you consider important for your company’s success. In the following five questions we ask you to name the persons that you think are important to your company.”* After entering these names, piping followed each of the five individuals, inserting their names for reference in subsequent questions, and allowing them to discern how often they met in the previous year, their category (e.g. family, friend, consultant, etc.), how they met the individual, how important they were to their business, and finally, the extent of trust they had for this individual.

Table 1 provides the numbers by category, for both groups of firms. Both groups identified nearly half of their important persons as “other”. For non-incubated firms, family members (14%), followed by incubator managers (13%), consultants (11%), and friends (8%) were the most prevalent categories. Note that 13 % of all non-incubated firms appeared to have relationships with incubator managers, although they are not members of incubators or otherwise listed by the incubator as firm affiliates. For incubated firms, consultants led the group (16%) followed by incubator managers (13%), Friends (8%) and family members (6%).

Table 2 provides the numbers by category as to how the entrepreneurs in each group met important individuals to the firm. 55% of non-incubatees identified “other”, and 46% of incubates did so as well. For non-incubated firms, family members were most important (19%), followed by colleagues

(11%), friends (5%), and business clubs (5%). For incubated firms, friends led the group (13%) followed by colleagues (10%), Family members (8%) incubator managers (6%), and capital providers (4%).

Table 3 examines the issue of trust, specifically, how trusted were the five most influential persons to the firm. Non-incubated firms had complete trust for 44% of their most important persons, as compared to 57% for incubated firms. They somewhat trusted 24% versus 21% of the incubated firms, and were neutral for 32% versus 15% for incubated firms. Interestingly, incubated firms identified 2% as distrusting somewhat, and 4% as completely distrusting persons important to their firm. Mean distributions, as determined by T-Tests show that there were no significant differences between the two groups regarding trust.

Table 4 shows the number of meetings for the two groups –incubated and non-incubated firms. The non-incubated firms meet on average 180 times per year with their five most significant persons, while the incubated firms meet almost twice as frequently, at 285 average meetings per year. T-tests show the difference between groups is significant at .03.

Given that the incubated group showed a strong preference for activities that might be considered bureaucratic, we elected to report their responses to business planning activities as well. We asked the respondents if they wrote a business plan, as well as the size of their business plans, how frequently they referenced them, and if they modified their plans during the past year.

Table 5 shows our results for business plans by length of pages. Surprisingly, all entrepreneurs indicated that they had a business plan, although 39% of the non-incubated and 33% of the incubated firms indicated that the plan was only one page. The 2-10 page group accounted for 25% of the non-incubatees and 10% of the incubated firms, while the 11-20 page group were more similar (17% NI and 15%I). Reflecting a preference for longer plans, the incubated group reported 20% in the 21-35 page category, versus 14%, 16% in the 36-51 page category versus 6%, and 4% between 52-100 pages long versus 2%.

Table 6 shows how often the business plans were referenced. The two groups seem quite similar on this account, with 45% of the non incubated (and 40% of the incubated) reporting they referenced their business plans only one time last year. Almost the same number reported referencing their plans 2-12 times (43% of NI's, 40% of I's), while only 11% of the non-incubated firms reported 13 or more references, as compared to 20% for the incubated firms.

Finally, Table 7 shows how often business plans were modified. Again, both groups look quite similar on these dimensions. The non-incubated group modified their plans only once (52%) vs. 44% of the incubated firms. 41% of the non-incubatees reported 2-5 changes, as did 47% of the incubated firms. Only 6% of the non-incubated and the incubated firms reported modifying their business plans 6 or more times in the past year.

DISCUSSION

Research directly comparing incubated and non-incubated firms is scarce, partly due to methodological constraints. Incubated firms are typically inundated with attention from various directions, and they were particularly unwilling respondents. We believe this study, comparing incubated with non-incubated firms is unique in the literature, and we provide some tentative observations regarding our research.

When we began our study, we attempted to compare incubated firms with those who had requested admission to incubators, but were denied. We visited a number of incubators across Canada, attended incubation conferences, and collected information regarding the nature of incubation work, and the role of the incubator manager, for over sixty incubators. Unfortunately, and somewhat surprisingly, we found that lists of denied entrepreneurs didn't exist. We identified two primary reasons for the absence of the rejected applicant lists. First, incubators are not prone to collecting and preserving information – they are generally more engaged in the day to day operations of supporting firms, allocating space, and obtaining the necessary resources for their own sometimes considerable operating expenses. Second, we found that

rejecting applicants was more of an exception than a norm. The incubator managers we met indicated that one of their biggest problems was maintaining low vacancy rates – essentially – paying the rent for their real estate. In most locations, subsidized rent is precluded, as this would amount to an anti-competitive public subsidy for certain private sector firms. Prospective entrepreneurs needed to be convinced that locating themselves inside an incubator, and attending to the considerable entry requirements, applications, presentations, and potential intrusive observation, was worth the expended effort. Thus, in order to maintain a full incubator, as well as to justify their activities by meeting regional accounting and benchmark goals, incubator managers had to spend considerable time marketing themselves to potential entrepreneurs. Few managers were able to identify more than a few entrepreneurs who were denied access to their incubators. Slightly more frequently they mentioned denied entry because the types of businesses the applicants were engaged in failed to match the mandate established by the incubator’s board.

Having established that the population of denied entry firms was rather limited, our next approach was to establish a parallel set of firms equal to the incubated firms, according to their age, size, industry, and location. We compared these two populations – that of incubated firms, and that of non-incubated firms – along a number of dimensions relating to the social network they established for their firms. Theoretically, social networks may differ on a number of dimensions. For example, some social networks are more dense, more closed, and exhibit high trust between various members (Burt, 2000; Kilduff and Tsai, 2003). Other networks are characterized by loose connections – what Granovetter refers to as the strength of weak ties (Granovetter, 1985). We postulated that incubated firms would have more dense networks, and would be more likely to associate with other members of the incubation network, including sources of capital, consultants, board members, and incubator managers. This would have shown up in terms of both the source of their most important contacts (the incubator manager) and referencing the incubator manager himself, as a key important person in the business. In contrast, we expected that non-incubated firms would be more likely to source their social network from family and friends, and also more likely to obtain the kind of specialized network advice that would be most appropriate to their business. They would be less likely to rely on incubator staff for support. Further, while the incubated firm might have a ready source of legal, accounting, or financial support, these sources, might, to a large extent, pre-determined, and may result in a slight mismatch between the needs of the firm and the capabilities of the incubator. This would be exhibited as a lack of trust between the key support persons and the entrepreneur. In contrast, the firms external to the incubator would have no choice but to solicit support through their own, weaker network. However, because they would be less constrained in normative choices, they may have had advantages in identifying the precise type of support required for their specific needs. We anticipated they would have higher levels of trust.

Our findings regarding the five most important persons to the firm were, in some ways, quite surprising. We provided the entrepreneurs with a choice, intentionally avoiding the use of “customer”, as we decided to examine individuals outside the market, theoretically related to social capital, such as incubator managers, friends, and family, in terms of their potential support to the business (as a result, our “other” category was consistently near 50%). We anticipated that incubated firms would be much more likely to identify the incubator manager as one of the most important individuals to the firm. To our surprise, both incubated and non-incubated firms cited the incubator manager rather infrequently – each identified them in 13% of the cases. Of particular note was that non-incubated firms were as likely to connect with an incubator manager as incubated firms. This finding highlights the community role that incubator managers play, their importance to the small business sector in general, and their role as advocate, above and beyond that of promoting firms within their particular incubator jurisdiction. Other categories of persons influential to these firms also appeared to be quite similar, such as consultants and friends. The non-incubated entrepreneurs seemed to make a slightly greater use of family members than did the incubated firms, something we anticipated. Finally, incubated firms were much more likely to identify capital providers as influential. This may reflect on the activities of the incubators, as access to angel investors and venture capitalists was one of the more constant goals and objectives of the incubation process.

Next, we examined how the entrepreneur had met their most influential persons. We expected the incubated firms to rely more on institutional persons, and less on family and friends. Here, we found that the non-incubated firms made much greater use of family members than the incubated firms, conforming to our expectations. Non-incubated firms did rely more upon their families than incubated firms. Interestingly, both made a frequent use of friends and colleagues in order to meet influential people.

We were very surprised at how infrequently incubated entrepreneurs identified the incubator manager as introducing them to influential people – only 6% identified such connections. This suggests that the social networks provided by the incubators may not be particularly influential.

We also examined the issue of trust, providing the entrepreneurs with a 5 point likert scale, from distrust completely to trust completely. Literature on trust is extensive, and generally is linked to social capital and the formation of network relations (Coleman, 1990). Incubated firms demonstrated much higher levels of trust than non-incubated firms. Of note, however, was that incubated firms identified a much higher percentage as “distrust completely”, an attribute that was nearly absent from the non-incubatees. This suggests two characteristics of incubator relations – the first, that certain relationships are particularly high in trust, more so than would be outside the incubator, the second, that incubators may, under certain circumstances, be coercing entrepreneurs into support arrangements with individuals they have little trust in.

Next, we examined how frequently entrepreneurs met with the five most important persons to the firm. As previously stated, this question directly relates to the type of social network provided by the incubator, as frequency of meetings is one operational component of social capital (Putnam, 2000). We observed that entrepreneurs in incubators have considerably more meetings with persons important to the firm than non-incubated entrepreneurs. This suggests that, from this one perspective of social capital, firms in incubators are particularly, and statistically significantly, advantaged.

There were two components of the incubated firms’ characteristics that suggested bureaucratic routines – both the aforementioned frequency of meetings, and the identification of non-trusted important individuals. As a result of these findings, we decided to examine other aspects of potentially bureaucratic routines, to see if they were also in greater evidence in the incubated versus the non-incubated group. In particular, we elected to examine business plans for this purpose, postulating that incubated firms would be more likely to write plans, write longer plans, and use them more frequently, than the non-incubated firms. Such behavior has been linked to institutional and bureaucratic routines in other studies (Honig & Karlsson, 2004). Our findings were that incubated firms were more likely to write longer business plans, more likely to reference these plans, and also more likely to modify their plans throughout the year. Because the link between planning and efficiency is poorly established, we view this difference between incubated and non-incubated firms as highlighting a potentially constraining activity promoted and supported by incubator managers. In particular a predilection for unusually long business plans that exceed normative dimensions on the part of incubated firms may directly relate to attitudes promoted by incubator managers or staff members.

In summary, we found significant differences between the incubated and non-incubated firms. Incubated firms relied less on family members, and more on professional consultants. This was true not only for individuals important to the firm, but also for networking purposes – incubatees were less likely to be introduced to an important person by a family member. Incubatees demonstrated higher levels of trust – but also higher levels of distrust. They also met with important persons to the firm far more frequently than their non-incubatee comparison entrepreneurs. All of this suggests that social capital networks are very different between incubated and non-incubated firms. Finally, we found that incubated firms were

more bureaucratic, having longer business plans that were more frequently modified, and more frequently referenced.

As with all studies, this research has limitations that other scholars should be aware of. Measures of firm development, incubator development, the sustainability of a growth incubator, and the quality, scope, and effectiveness of incubator advice were not examined in this research (Mian, 1997). Further, we did not examine the quality of the fit between the business incubation services offered by the incubator and the needs of the local market, which can also affect success and network formation (Autio and Klofsten, 1998). In addition, because of the many different types of incubators as well as the regional specificity associated with each incubator, there is no standard industry model, and we did not attempt to control for these variations. This is one of the reasons that measuring the economic outcome of incubators is quite difficult (Molnar and Grimes, 1997). However, we believe that this study, uniquely comparing an in-group with an out-group, adds concrete empirical evidence of interest to scholars and public policy actors.

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REFERENCES

- Aldrich, H. (1999). *Organisations Evolving*. London: Sage Publications Limited.
- Allen, D.N. and R. McCluskey, 1990, 'Structure, Policy, Services, and Performance in the Business Incubator Industry,' *Entrepreneurship Theory & Practice* 15 (2), 61–77.
- Allen, D. N. and Weinberg, M., (1988) 'State Investment in Business Incubators', *Public Administration Quarterly*, 12 (2) p 196 – 215
- Autio, E. and M. Klofsten, 1998, 'A Comparative Study of Two European Business Incubators,' *Journal of Small Business Management* 36 (1), 30–43.
- Bauer, H. and Hannig, U. (1992) 'Kritische Erfolgsfaktoren deutscher Technologiezentren'. Koblenz Wissenschaftliche Hochschule für Unternehmensführung.
- Bearse, P. (1998) 'A Question of Evaluation: NBIA's Impact Assessment of Business Incubators' *Economic Development Quarterly*, November, v12 issue 4, (322-335)
- Birch, D. *The Job Generation Process*. MIT Program on Neighborhood and Regional Change, Cambridge, MA, 1979.
- Bollingtoft, A., Ulhoi, J. (2005): The networked business incubator – leveraging entrepreneurial agency. In: *Journal of Business Venturing* 20: 265-290.
- Burt, R. (1992). *Structural Holes: The Social Structure of Competition* Cambridge, MA: Harvard University Press.
- Burt, R. S. (2000). The network structure of social capital. In R. Sutton & B. Staw (Eds.), *Research in Organizational Behavior*. Greenwich Ct.: JAI Press.
- Campbell, C., (1989):, 'Change Agents in the New Economy: Business Incubators and Economic Development,' *Economic Development Review* 7 (2), 56–59.
- Campbell, C. and D.N. Allen, 1987, 'The Small Business Incubator Industry: Micro-level Economic Development,' *Economic Development Quarterly* 1 (2), 178–191.
- Campbell, C.; Berge, D; Janus, J and Olsen, K (1988) 'Change Agents in the New Economy: Report on Business Incubation and Economic Development', University of Minnesota, Minneapolis, Minnesota.
- Cartner WB, Shane SA. 1995. Measuring entrepreneurship over time. *Journal of Business* 10:283-301
- Coleman, J. (1990). *Foundations of social theory*. Cambridge: Belknap press.

- Colombo, M. Delmastro, M. 2002, How effective are technology incubators? Evidence from Italy, *Research Policy* 31 (2002) 1103–1122
- European commission enterprise directorate general, 2002, A Benchmarking of Business Incubation, Brussels, Belgium.
- Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91(3), 481-510.
- Greene, P., & Brown, T. (1997, May). Resource needs and the dynamic capitalism typology. *Journal of Business Venturing*, 12(3), 161-173.
- Hackett S.M. and Dilts, D.M. 2004. *Journal of Technology Transfer*, 29, 55–82, 2004 Kluwer Academic Publishers. Amsterdam.
- Hansen, M.T., H.W. Chesbrough, N. Nohria, and D.N. Sull, 2000, ‘Networked Incubators: Hothouses of the New Economy,’ *Harvard Business Review* 78 (5), 74–84.
- Honig, B., & Karlsson, T. (2004). Institutional forces and the written business plan. *Journal of Management*, 30(1), 29-48.
- Karlsson, Tomas, (2005). *Business Plans in New Ventures*. Jibs dissertation series, Jonkoping International Business School, Jonkoping, Sweden.
- Katz J.A. 1991. The institution and infrastructure of entrepreneurship. *Entrepreneurship Theory Pract.* 15(3): 85.102
- Kilduff, M. and Tsai, Wenpin. (2003). *Social Networks and Organizations*. Sage Publications.
- Kuratko, D.F. and W.R. LaFollette, 1987, ‘Small Business Incubators for Local Economic Development,’ *Economic Development Review* 5 (2), 49–55.
- Latona, J. C. and LaVan, H. (1987) ‘Public Private and University Support for Incubators and Enterprise Development: A Comparative Analysis’, Paper at Conference of Small Business Institute of Directors Association (SIBDA).
- Lewis, D.A., 2002, *Does Technology Incubation Work? A Critical Review of the Evidence*, Athens, OH: National Business Incubation Association.
- Lichtenstein, G. A. (1992) ‘The Significance of Relationship in Entrepreneurship: A Case Study of the Ecology of Enterprise in Two Business Incubators’, Unpublished PhD at Wharton School, University of Pennsylvania
- Martin, F. (1997) ‘Business Incubators and Enterprise Development: Neither Tried or Tested?’ University of Stirling Conference Paper to the International Council for Small Business.
- Markley, D.M. and K.T. McNamara, 1995, ‘Economic and Fiscal Impacts of a Business Incubator,’ *Economic Development Quarterly* 9 (3), 273–278.
- Merrifield, D.B., 1987, ‘New Business Incubators,’ *Journal of Business Venturing* 2, 277–284.
- Mian, S. A. (1994) ‘US University-sponsored Technology Incubators: An Overview of Management, Policies and Performance’ *Technovation* (Oct) 14 (8) p515-528
- Mian, S.A., 1996, ‘Assessing Value Added Contributions of University Technology Business Incubators to Tenant Firms,’ *Research Policy* 25, 325–335.
- Molnar, L.A.; Grimes D. R; Edelstein, J; De Pietro, R; Sherman, H.; Adkins, D. and Tornatzsky, L. (1997) ‘Business Incubation Works: Results of the Impact of Incubator Investments Study’ Athens, OH, NBIA Publications
- National Business Incubation Association (1997) Tenth Anniversary Survey of Business Incubators 1985 – 1995 :A Decade of Growth, NBIA, Ohio
- Nowak, M.J. and C.E. Grantham, 2000, ‘The Virtual Incubator: Managing Human Capital in the Software Industry,’ *Research Policy* 29, 125–134.
- OECD (1997) ‘Technology Incubators – Nurturing Small Firms’ OECD Publications, Paris http://www.oecd.org/dsti/sti/s_t/inte/prod/e_97-202.pdf
- Phan, PH; Siegel, D.S., and Wright, M. (2005). Science parks and incubators: observations, synthesis and future research *Journal of Business Venturing* 20 (2005) 165–182
- Putnam, R. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.

- Rice, M. (1992) 'Intervention Mechanisms Used to Influence the Critical Success Factors of New Ventures: An Exploratory Study', Centre for Entrepreneurship of New Technological Ventures, Rensselaer Polytechnic Institute, Troy, New York
- Shane, S., & Cable, D. (2002). Network ties, reputation, and the financing of new ventures. *Management Science*, 48(3), 364-381.
- Sherman, H., 1998, 'Comments on Peter Bearse's "A Question of Evaluation"', *Economic Development Quarterly* 12 (4), 334-335.
- Roper, S., 1999, 'Israel's Technology Incubators: Repeatable Success or Costly Failure,' *Regional Studies* 33 (2), 175-184.
- Sherman, H., 1999, 'Assessing the Intervention Effectiveness of Business Incubation Programs on New Business Start-ups,' *Journal of Developmental Entrepreneurship* 4 (2), 117-133.
- Sherman, H. and D.S. Chappell, 1998, 'Methodological Challenges in Evaluating Business Incubator Outcomes,' *Economic Development Quarterly* 12 (4), 313-321.
- Siegel, D.S., Westhead, P., Wright, M., 2003b. Assessing the impact of Science Parks on the research productivity of firms: exploratory evidence from the United Kingdom. *International Journal of Industrial Organization*. 21 (9), 1357-1369.
- Smilor, R.W., 1987, 'Managing the Incubator System: Critical Success Factors to Accelerate New Company Development,' *IEEE Transactions on Engineering Management* EM-34 (4), 146-156.
- Storey, D. *Entrepreneurship and the New Firm*. Croom Helm, London, 1982.
- Udell, G. G. (1990) 'Are Business Incubators Really Creating Jobs by Creating New Businesses and New Products?', *Journal of Product Innovation Management* 7 p 108-122
- Uzzi, B. (1999). Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing. *American Sociological Review*, 64(4), 481-505.
- Westhead, P., 1997. R&D 'Inputs' and 'Outputs' of technology-based firms located on and off Science Parks. *R&D Management* 27, 45-62.
- Westhead, P., Storey, D.J., (1994). *An Assessment of Firms Located On and Off Science Parks in the United Kingdom* HMSO, London.
- Siegel, D.S., Westhead, P., Wright, M., (2003b). Assessing the impact of Science Parks on the research productivity of firms: exploratory evidence from the United Kingdom. *Int. J. Ind. Organ.* 21 (9), 1357-1369.

APPENDIX

Table 1: The five most important persons to the firm, by category

	Non- Incubated firms	Incubated firms
Family member	24 (14%)	15 (6%)
Consultant	20 (11%)	40(16%)
Incubator Manager	22 (13%)	34 (13%)
Friend	14 (8%)	26 (8%)
Colleague	9 (5%)	8 (3%)
Business Club	2 (1%)	9 (3%)
Media	1 (.5%)	0
Competitor	0	3 (1%)
Capital provider	0	13 (5%)
Other	78 (45%)	107 (42%)
N	36	51
Total responses	170	255

Table 2: Who introduced you to the most important persons to the firm, by category

	Non- Incubated firms	Incubated firms
Family member	31 (19%)	19 (8%)
Colleague	19 (11%)	25 (10%)
Friend	9 (5%)	31 (13%)
Business Club	9 (5%)	16 (6%)
Competitor	3 (2%)	4 (2%)
Incubator Manager	2 (1%)	14 (6%)
Consultant	0	9 (4%)
Media	0	1 (.5%)
Capital provider	0	10 (4%)
Other	92 (55%)	112 (46%)
N (five persons possible in each category)	36	51
	165	241

Table 3: Measures of Trust for 5 most important persons to firm

	Non-Incubated firms	Incubated firms
Trust completely	71 (44%)	148 (57%)
Neither trust nor distrust	56(32%)	40 (15%)
Trust somewhat	42 (24%)	7 (21%)
Distrust somewhat	1 (.5%)	7 (2%)
Distrust completely	0	9 (4%)
N	37	51
Total responses	165	225
Mean	1.94	2.54
Std. Deviation	1.58	1.89
Std. Error Mean	.259	.264
F: 2.78		
T: -.158		
Sig (2-tail) .11		

Table 4: Number of meetings with 5 most important persons to firm

	Non-Incubated firms	Incubated firms
Meetings per year (mean)	180	285
N	34	51
F: 7.12		
T: -2.18		
Sig (2-tail) .03		

Table 5: Business plan: Number of pages

	Non-incubated firm	Incubated firm
1 page	14 (39%)	17 (33%)
2-10 pages	9 (25%)	5 (10%)
11-20 pages	6 (17%)	8 (15%)
21-35 pages	4 (14%)	11 (20%)
36-51 pages	2 (6%)	8 (16%)
52-100	1 (3%)	2 (4%)
N	36	51

Table 6: Business plan: how often referenced in past year

	Non-incubated firm	Incubated firm
Once only	17 (45%)	21 (40%)
2-12 times	15 (43%)	20 (40%)
13 or more	4 (11%)	10 (20%)
N	36	51

Table 7: Business plan: how often modified in past year

	Non-incubated firm	Incubated firm
Once only	19 (52%)	23 (44%)
2-5 times	15 (41%)	23 (47%)
6 or more	2 (6%)	3 (6%)
N	36	51