

More Rigor in Sampling Procedures for Informal Investor Research: Towards Reaching a More Representative Angel

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Abstract

The literature about informal investors, persons who individually invest in new and expanding entrepreneurial endeavors, has grown considerably over the past decade. Most of the results, however, are based on methodologies which do not include a randomly selected sample of respondents. Proper sampling procedures are necessary for the literature to grow beyond the case-dependent, descriptive work of the past decade. By combining the case-dependent descriptive work with randomly sampled empiricism, a richer and more rigorous body of work will result, thus allowing greater contributions to theory and ultimately practice. Specifically, the author believes that better sampling will show informal investors who are: younger, include more women and one-time investors, are from more diverse economic conditions and educational backgrounds, conduct less of an active search, and do not plan any exit strategy.

Introduction and Review

Extensive research on informal investors has only just begun in the past decade or so. Sometimes referred to as business angels, these are individuals who invest in the entrepreneurial opportunities of other entrepreneurs. This paper describes briefly the nature of informal investment and the development of the research over the past decade. Next, it outlines problems which result from the use of non-randomly selected samples, and then discusses theoretical and practical issues which are unresolved unless a more rigorous approach is adopted. The paper goes on to suggest a new methodology for sampling angels and makes suggestions as to how the literature may evolve with more representative sampling.

Business angel investors use their own money and their own due diligence to invest in the entrepreneurial opportunities of other entrepreneurs. By definition, an informal investor not the entrepreneur for the venture in which they are investing, nor are they family of the entrepreneurs. Angels have been shown to be predominately male, between the ages of 45 and 65, have significant net worth and annual incomes in excess of \$100,000 US (Aram, 1989; Riding, Cin, Duxbury, Haines and Safrata, 1993; Lundstrom, 1993). Some angels actively seek investment opportunities and others are among the more passive, preferring to await referrals. The frequency of their investments ranges significantly and many angels are, or were, entrepreneurs in their own ventures at one time (Aram, 1989; Kay Sullivan, 1991).

Angels are an important source of equity capital, particularly for businesses in the seed, start-up or early expansion phases of development and growth, because of the sizable pool of

capital they represent and because venture capital sources of equity usually service entrepreneurs seeking \$500,000 or more (Freear and Wetzel, 1990). Venture capital is professionally managed capital, and the projects that are pursued need to be large enough to pay the professionals and sustain the venture capital organization in addition to producing good returns for the venture capital owners. As well, venture capital firms appear, more and more, to be interested in later-stage projects where the capital is used to replace ownership (as in a management buy-out or a management buy-in) and is not used to create further value added to the company. Some of this venture capital has come to be called 'replacement capital' (Murray, 1994). The perceived lack of real 'venturing' on behalf of venture capital companies (Murray, 1991) has increased the importance of business angels -- the providers of smaller amounts of true risk capital.

Pattern in the Literature

The early literature, in the 1980s, was highly case-dependent and necessarily descriptive as the research struggled to define: who these investors were, where they were, in what they were investing, how they were finding opportunities, and how much capital they controlled. During the 1990s, the focus of the literature expanded to examine: networks for angels; angels' behaviors; their attitudes towards and handling of risk; their roles in equity provision; and their relationships with their entrepreneurs. In practice, government agencies and policy makers began to realize the importance of informal investment to the execution and well-being of start-ups and early expansions and became interested in defining exactly how much informal investment funds were available in their regions.

In the future, investment exits, attitudes about exits, exit horizons, and expected and realized rates of return will be an important area for research. The best research opportunities will be facilitated by samples of angels who have made investments at different time periods. This would allow the research to isolate immediate post investment attitudes and activities from long term post investment strategies and exits.

Statistical Problems in Reporting

However, problems exist with the current literature on business angels; current sampling procedures need to be improved in the angel research. Inadequate sampling procedures were acceptable while the field was young as researchers struggled with exploratory studies to develop a framework for future research. With the growth of interest in the area, it is time for researchers to adopt more rigorous methods.

Random probability sampling procedures include cluster samples and stratified samples. Non-random probability sampling includes quota samples (where data are chosen to fulfill known characteristics of the population) and convenience samples (where sample members are chosen for the ease with which they can be identified or accessed). Convenience samples include the snowball technique (asking a potential respondent if they know any other respondents) and judgment or purposive samples (where the sample is selected based on some appropriate characteristic of the sample members) (Sudman, 1976). Most of the angel research to date has been conducted with the use of non-probability convenience samples including mailing lists of self-identified angels

belonging to business angel networks (Stevenson and Coveney, 1994), mailing lists of persons with high discretionary incomes such as dentists, MBA graduates and subscribers to venture magazines in large urban areas (Harr, Starr and MacMillan, 1988), and snowballing from formal venture capitalists and some known angels (Riding et al., 1993).

The type of the sampling method is essential to quantitative empiricism because of the types of sampling errors. While inadequacies in the measurement process, called measurement errors, can be limited through attention to particular details in the research process, sampling errors can only be reduced by attention to a randomly selected probability sample (Lewis-Beck, 1994). The central limit theorem and the law of large numbers permit sampling errors to be estimated only when the data have been collected by a random sampling procedure. Confidence intervals, on which we put much reliance, can only take on real meaning when the results are applied to properly sampled sets of data. While confidence intervals do not allow us to know whether the results are exactly correct, they do allow us to estimate the probability that the results will be inaccurate. We should endeavor to make confidence intervals as valid as possible by providing the underlying grounding necessary for validity.

Publication should include estimates of sample errors, but no statistical estimates of error can be computed when the sample is selected non-randomly. For certain, errors will exist. If we were to admit the existence of unspecified sample error in advance -- a kind of 'lowered head' in acknowledgment of a sample's faults -- we still cannot specify in which direction the errors lie (Lewis-Beck, 1994). When sampling errors are unspecified, our assumption is that the error likely lies equally distributed around the mean. In acknowledging that an error exists, the unspoken caveat is that the error probably lies equally distributed around the mean. There is, however, nothing to suggest that that may be the case. The errors may all be in one direction or, perhaps, in the other, or they may be about the mean, or they may not. Without a random sample there is simply no way to know in what way the error may be skewed.

Specifically, two areas of the angel research can be improved by more diligence to sampling procedures. The first is the bias introduced to the literature by defining an entire group of angels by the research conducted on a limited number of sub-sectors that are easily interviewed and observed. The second is the limited theoretical, and hence practical, development possible by purely descriptive work (which is all that is possible with non-random sampling). Both of these are caused, directly or indirectly, by the difficulty in randomly sampling angels.

The second issue is not a new problem and has been written about and considered by academicians, theorists, practitioners and philosophers for years. Describing discreet pockets of subjects, without the benefit of random sampling, does not permit us to generalize results from one pocket of individuals to another. Thus, we are provided with only limited opportunities for extrapolating the findings in one area to the population. The development of theory is hampered.

The literature to date is being shaped (or possibly 'mis-shaped') by these sampling procedures. In snowball and judgment samples, only a limited number of angels have a chance of being selected; the others do not have a chance of being selected since they do not form part of the sampling frame. The current methods of selection favor those angels who operate in urban

locations, and are more likely to be members of Boards of Trade, and venture capital and financial associations which are largely located in urban areas. Hence, the literature is being defined by certain segments of research subjects who happen to be in the sectors where the researchers are looking for them. So, improving sampling procedures helps correct two problems: providing a more accurate representation in the literature by having included all of the population in the sampling frame, and the movement towards theoretical developments by being able to making generalizations about populations.

A Suggested Methodology

In fairness, the lack of randomly sampled angel activity has been because of the difficulty in accessing such populations. This problem has manifested itself because angels are more invisible, do not appear in listings or directories, do not necessarily call themselves 'angels' or, in fact, may not know that there is a category of financial endeavor about the activities of private informal investors. They are a small minority of the investing population - much like trying to randomly sample the 'needles in the hay stack.' So the question remains how to develop a methodology that allows us to study angels without using inappropriate sampling frames. The following methodological proposal is one way which may help researchers with sufficient budgets. This methodology would also be appropriate for physical geographic areas where there are no formal networks to bring angels or opportunities together.

In most jurisdictions, incorporated and non-incorporated companies are registered by a governing agency or government body which regularly produces lists of those registered in a specified period. In Canada, this is public information. Because the population of angels is unknown, much of the sampling error from lack of randomness could be reduced by surveying angels as a random selection across *all new business registrations*. In this way, all businesses registered would be part of the sample and they would be the source for the random selection of companies. *New* business registrations are sampled because the angels tend towards seed, start-up and early stage companies and new registrations would be where most angels would be expected to be found. Sampling new business registrations over a period of years, for example five years past, would accommodate registrations where angel follow-on financing may have been introduced after the company was started. As there are no estimates of the proportion of companies which include angel financing, this sample would need to be necessarily large to accommodate a possible low response rate combined with a suspected low proportion of angel-type deals.

A qualifying question could identify the existence of any angel investments during the capital formation. The limiting, or qualifying criterion for entry into the research is whether or not the company's entrepreneur has had financing, at any stage, which has been provided by an individual investor who is not a member of the entrepreneur's family. Studies by Aram (1989) and Ehrlich, De Noble, Moore and Weaver (1994), and Gaston (1989) have employed methodologies incorporating a broader base similar to the one noted here. In this way, it would be possible to include angels in the sample who are not a part of established financial cliques, clubs and networks. These angels might otherwise have not been represented in the survey results.

The author expects that angels will look significantly different as a result of more representative samples due to the wider scope of individuals who will be involved. These differences may include: younger average age, more women, less emphasis on active search, more one-time investors, and less sophisticated exit strategies.

During the next decade, the development of a literature from methodologies using randomly sampled samples would facilitate generalizations about populations, improve the development of theory in the field, and provide better information for entrepreneurs and informal investors.

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