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Success from satisficing and imitation: Entrepreneurs' location choice and implications of heuristics for local economic development ☆

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ABSTRACT

This paper presents new data on entrepreneurs' self-described decision processes when choosing where to locate, based on scripted interviews with business owners. Consideration sets and quantities of information acquisition are surprisingly small, especially among entrepreneurs who are successful at meeting or exceeding their own expected rates of return. Locations are frequently discovered by chance. Few entrepreneurs describe decision processes comparing the marginal benefits and marginal costs of continuing search. Entrepreneurs express skepticism about the utility of applying probabilistic beliefs to one-off high-stakes choices in their changing environments. Nearly all interviewees describe decision-making processes based on threshold conditions that are not updated along the search path and do not depend on the number of feasible locations, which can be interpreted as direct evidence of satisficing. Imitation is beneficial for small investment projects. Policies seeking to stimulate local economic development with tax incentives within enterprise zones should be rethought in light of entrepreneurs' small consideration sets and satisficing decision process. A lexicographic decision-tree analysis of self-reported success (by the standard of falling below, meeting, or exceeding one's expected annual rate of return) far outperforms maximum-likelihood models in terms of fit and out-of-sample predictive accuracy. The data reveal a less-is-more effect by which entrepreneurs with simpler decision procedures (i.e., requiring less information) and smaller consideration sets enjoy far higher chances of exceeding expectations.

1. Introduction

This study takes an empirical approach to describing the process by which business owners make high-stakes decisions about where to locate businesses or new branches of existing businesses. Rather than assuming that location choice results from a process of optimization, this study uses a scripted in-depth interview of 49 entrepreneurs (i.e., business owners or those with personal capital at risk when making location choice decisions) in the Dallas-Fort-Worth greater metropolitan area. The scripted interview seeks to elicit information about the size of business owners' consideration sets, the criteria they use for stopping search, and the criteria used to finally select an element from the consideration or choice set (following interview methodology proposed by Bewley, 1999; Schwartz, 1987, 2004a, 2004b; Wennberg & Nykvist, 2007; Yonay, 2000; Yonay & Breslau, 2006).

The interview data reveal three main findings. First, entrepreneurs' consideration sets are extremely small—much smaller than is predicted by many search models. Second, rather than beginning with a large-scale search to populate an initial universe of feasible locations or some other long list of alternatives for initial consideration, a surprising number of business locations are apparently discovered by chance, while entrepreneurs are involved with unrelated business activities or during leisure time. Third, the criteria used by business owners to finally make a decision and choose a single location from their consideration sets are almost always stated as static threshold rules that are not updated along the search path and do not depend on the number of feasible alternatives. This paper argues that those observations can be interpreted as evidence of satisficing heuristics. In addition, when asked directly about how tax incentives would (or do) influence location choice, the modal reaction was to ignore government's nudges to invest in regions of the city targeted by policies seeking to stimulate local economic growth in particular locations. The data reveal that, for purposes of designing policies aimed at bringing new private investment to regions that have not previously attracted investors, non-optimizing models of entrepreneurial decision process such as the satisficing heuristic (in contrast to as-if optimization models that assume large choice sets and generally imply high degrees of sensitivity to tax incentives) lead to new normative implications for policy regarding business taxation and local economic development.

Winter (1971) identifies decision process as an object of study that ties together numerous research traditions attempting to provide fuller descriptive (and normative) accounts of innovative or entrepreneurial

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behavior. Sarasvathy, Simon, and Lave (1998) similarly focus on characterizing entrepreneurs' decision processes. Sarasvathy (2001), Sarasvathy and Dew (2005), and Dew, Read, Sarasvathy, and Wiltbank (2009) uncover regularities in entrepreneurial decision making that deviate from the logical strictures of axiomatic rationality as defined in neoclassical economics to achieve high degrees of purposeful action (in the Schumpeterian sense), providing motivation for the present paper.

In search models that produce optimal stopping rules based on constrained maximization using the probability of success or a related scalar-valued expected payoff as the objective function, it is rarely optimal to search through all items in the choice set (Gittins, 1979; Lippman & McCall, 1979; Stigler, 1961). The process of optimization in search models requires, however, exhaustive consideration of all *durations* of search and all *paths* of search (in cases where the path is not exogenously given, as it is, for example, in the canonical "Secretary Problem" (Bruss, 1984). Optimal search models typically require that decision makers have probabilistic beliefs about the payoff-generating stochastic process, which leads to stopping rules that adjust systematically to each new piece of information acquired (Gittins, 1979). Without considering all durations and paths of search, and without forming probabilistic beliefs needed to associate an expected payoff with each combination of search duration and path, there is, in general, no way to be sure a global optimum is achieved. Locally comparing marginal benefit and marginal cost among pairs of search durations and search paths is sufficient for a global optimum only after introducing strong auxiliary assumptions (e.g., those that guarantee globally diminishing marginal benefits) which would imply that the decision maker has an instantaneous and costless view of all combinations of durations and paths and their functional relationship to payoffs. The infinite regress of increasing complexity is well known to those modeling bounded rationality as if the decision maker solves an optimal choice problem with additional cognitive or search costs in the constraint set: the combinatorics of exhaustive search through the universe of all possible search durations and paths results in an even more unrealistically difficult-to-solve optimization problem than those derived from simpler textbook models of consumer choice with costless and instantaneous search over all items in the choice set. This has led some critics of optimal search theory to consider non-optimizing models that achieve superior descriptive validity (e.g., Bearden, Rapoport, & Murphy, 2006; Laville, 2000a, 2000b) and superior performance when simple heuristics are well matched to environments in which they are used (Bookstaber & Langsam, 1985; Gigerenzer & Selten, 2001; Gigerenzer, Todd, & the ABC Research Group, 1999; Goldstein & Gigerenzer, 2009).

Economists often argue that the very essence of economics is the axiomatic assumption of optimization. Interpreting entrepreneurial behavior through the lens of that assumption that all observed behavior derives from a process of constrained optimization, however, introduces strong restrictions about what can be inferred from empirical observation and substantively influences prescriptive advice for private agents designing incentive contracts and public policy makers. In the context of local economic development, if one observes a region of a city that, for years, does not attract business investment, the assumption of optimization implies that the absence of commerce must result from a lack of profitable opportunities. If no one is investing in a particular neighborhood, the logic of optimization requires us to conclude that it must not be profitable to do so. The data here cast doubt on this logic. The data also reveal how descriptively false models of location choice can lead to economic development strategies that fail at attracting new investment (e.g., tax incentives for investing in stigmatized neighborhoods). Modest incentives that attempt to attract investors to particular locations by marginally increasing their expected return have little chance of succeeding if investors use decision processes that do not include those locations in their consideration sets in the first place.

The following story is typical. One of Dallas' prominent commercial high-rise and residential real estate developers describes noticing a large, undeveloped tract of land while driving to play golf in a northern suburb: "The idea struck me as I was driving by that area that it could be developed into a property of note. I told [my spouse] to drive by to get a feel for the area. We liked it. It felt right. Then I ran the numbers and it looked like we could get at least 20 percent annual return on capital within two or three years. That was enough to make it worthwhile to go ahead."

Reflecting on what is ruled out by this description is interesting. No exhaustive search exists through thousands of potential locations and alternative allocations of investment capital to ensure the highest possible ratio of return to risk. The literature includes no mention of benefits and costs associated with continuation of the search process. The interview explicitly asked what was expected if search had continued and included numerous questions about the size of the choice set and the other locations that were considered. The business owner's subsequent elaborations indicated that the information required to compute the net value of continuing search was simply unavailable, and instead a fixed threshold condition was applied (i.e., 20 percent return after three years). Combining intuition and limited quantitative information used to compute expected rates of return, the threshold was met that finalized the decision to invest.

Landlords investing in mall properties talked about requiring an 80 percent occupancy rate within a year. Gas station and convenience store investors talked about requiring at least 10 percent annual return on capital within one or two years. Nearly all business owners stated the decisive factor in their location choices as an inequality: "If I think I can get at least x return within y years, then I'll do it," where x is a prominent number (e.g., 1, 2, 5, 10, 15, 20, 50, or 100 [see Pope, Selten, Kube, and von Hagen (2009) for more on prominent numbers]) and y is typically one to three years.

Standard economic models (including many search models) stated in terms of calculus or extensions using the calculus of variations require that marginal benefit (approximately) equal marginal cost as a necessary but not sufficient condition for an optimal choice. Not one entrepreneur mentioned such a condition or described using a decision rule that equates any two quantities. Rather, entrepreneurs' reasoning was characterized by decision procedures stated in terms of simple thresholds or cut-off rules (i.e., satisficing).

Additional findings that emerge from entrepreneurs' descriptions of their decisions include two less-is-more effects. The decision processes they describe typically focus on one, two, or three pieces of information. Those who avoided too many types of information appear to have had a greater chance of meeting or exceeding the return they expected at the time of investment, the binary definition of success applied in the subsequent analysis. Second, a decision-tree classification model that predicts self-reported performance (i.e., falling below, meeting, or exceeding expectations) achieves a surprisingly high rate of out-of-sample predictive accuracy of more than 80% (and more than 90 percent accuracy in fitting). In contrast, maximum-likelihood estimates (i.e., from ordered probit models) have rates of accuracy uniformly below 50% in fitting (and considerably worse for out-of-sample prediction). By using less information, the non-compensatory classification tree model predicts performance with substantially greater accuracy, similar to previous studies of consumer behavior such as Yee, Dahan, Hauser, and Orlin (2007).

There is debate within behavioral economics concerning how to interpret such findings (Berg, 2003, 2010; Berg, Biele, et al., 2010; Berg & Lien (2005); Berg, Eckel, et al., 2010; Berg & Gigerenzer, 2007, 2010). When predictions of standard theory do not match what is observed in the laboratory or field, a common interpretation in behavioral economics is that the people are making mistakes. Some behavioral economists go as far as suggesting that the standard rational choice model enjoys exclusive normative authority and that educators, business schools and lawmakers should seek to "de-bias" people who fail to conform, modifying their behavior to be more in accordance with theories of optimal choice and axiomatic rationality (e.g., Jolls, Sunstein, & Thaler, 1998).