FROM CONCEPTION TO BIRTH: OPPORTUNITY PERCEPTION AND RESOURCE MOBILIZATION IN ENTREPRENEURSHIP

Jesper B. Sørensen and Olav Sorenson

ABSTRACT

Studies consistently find regions dense in concentrations of similar firms to be fecund sources of new firms of the same kind. This pattern persists even in industries with negative returns to geographic concentration. Why do these patterns persist? On the one hand, social networks may constrain entrepreneurs' opportunities, making it difficult to mobilize resources in more attractive locations. On the other hand, nascent entrepreneurs may systematically misperceive opportunities in such a way as to lead them to continue founding attempts in overcrowded regions. To distinguish between these two processes, we analyze a unique set of data on television stations that contains information on both attempts to start new stations, as well as successful foundings. Our exploratory analysis suggests that nascent entrepreneurs do consistently misinterpret information related to population dynamics. These patterns could easily contribute both to industrial agglomeration and to the fragility of Red Queen dynamics. We discuss the implications of these results both for future research and for public policy.

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INTRODUCTION

The vast majority of research on industrial districts attributes the geographic clustering of industry to an underlying spatial concentration of resources (Christaller, 1933; Lösch, 1940; von Thünen, 1826), or to positive externalities that derive from co-location (Krugman, 1991; Marshall, 1890; Porter, 1990; Romer, 1986). In a departure from this stance, Sorenson and Audia (2000) contend that the geographic concentration of industry can sustain itself even in the absence of benefits to firms that locate in close proximity to their rivals. Their argument relies on the idea that the likelihood of entering a particular industry is not randomly distributed across potential entrepreneurs. More specifically, if most prospective entrepreneurs in an established industry arise from the ranks of employees of existing firms in that industry, and if entrepreneurs tend to locate their fledgling enterprises in the community in which they live, organizational foundings will arrive more frequently in the regions in which production currently concentrates. Studying the U.S. footwear industry, Sorenson and Audia (2000) demonstrate that the local concentration of manufacturing plants increases the mortality rates of these facilities; thus, one would expect the industry to disperse geographically over time. Regardless, because foundings also depend strongly on the local density of footwear plants – almost all new organizations appear in the same locales as existing firms – the industry preserves its geographic distribution over long periods of time.[1]

Sorenson and Audia's findings pose a puzzle for both industrial geography and entrepreneurship research: why should regions with higher failure rates for established firms in the same industry also exhibit elevated entry rates? Such a pattern does not fit with the notion that rates of entry reflect the underlying distribution of opportunities, since higher failure rates imply that firms in concentrated regions experience more intense competition. Making progress in solving this puzzle requires a more careful examination of the entrepreneurial process, notably an analytic separation of two potentially distinct phases of new firm formation. Variation across regions in the rates of new firm formation can, in principle, come from two sources: (i) regional variation in the ability of potential entrepreneurs to mobilize resources; or (ii) variation in the regional rate of entry attempts (i.e. the rate at which people begin the resource mobilization process).

Although we can distinguish between these sources of variation theoretically, they may not generate distinct empirical patterns. If one believes that the decision to attempt entry reflects accurate assessments by prospective entrepreneurs of the likelihood of successfully mobilizing resources, then the two processes should mirror each other. In other words, the factors that accelerate or retard the resource mobilization process should have the same effects on the rate at which prospective

entrepreneurs attempt entry. If true, we would only need to understand how local conditions affect the resource mobilization process to understand variation across regions in the entry rate. On the other hand, if the process generating entrepreneurial attempts operates separately from the resource mobilization process, the theoretical and empirical challenge involved in explaining geographic concentration increases considerably. In this latter case, we must also identify the causal mechanisms driving variation in the perception of opportunities, in addition to the mechanisms driving the distribution of opportunities.

Most entrepreneurial research analyzes counts of business starts but neglects, due to data limitations, the dynamics of attempts at entrepreneurship (for an exception, see Carroll & Hannan, 2000, pp. 339–356, on automobile pre-producers). Although these studies give a broad picture of the relationship between environmental factors, industry structure and entrepreneurship rates, they cannot distinguish between the possible mechanisms through which these factors influence business starts. Do they increase the number of entrepreneurs attempting to enter the industry? Or, do they increase the availability of resources, thereby easing the mobilization process?

This paper addresses the question of whether these two phases of the entrepreneurial process operate distinctly by examining to what extent apparent perceptions of entrepreneurial opportunity, as reflected in attempts at entry, mirror the reality of the resource mobilization process. We begin to address these issues by analyzing a data set on entrepreneurial events in a unique industry: local broadcast television stations. More specifically, we estimate the effects of a variety of measures of local market conditions (e.g. the number of households with televisions) and local competitive dynamics (e.g. recent foundings and failures of stations) on two dependent variables: (i) the number of groups interested in starting a new station; and (ii) the time that it takes for those groups to begin broadcasting. Comparing the influence of various factors across these two outcomes allows us to assess the degree to which entrepreneurs' perceptions accurately reflect the underlying competitive environment.

The broadcast television industry has two unique features that allow us to gain considerable purchase on the questions at hand. First, the local nature of markets in the broadcast television industry eliminates many potential alternative processes. In most industries, agglomeration economies could explain differences in the attractiveness of different regions; however, in local television markets these supply-side explanations do not come into play, since the resources required to establish a television station do not concentrate geographically. Population density is the main factor driving regional variations in the prevalence of television stations, but we can easily measure this factor. Second, the Federal Communications Commission (FCC) regulates the television industry. Although regulation often

creates a disadvantage in terms of one's ability to draw broad conclusions, from our perspective, it provides rare insight into the entrepreneurial process. Because the FCC requires potential entrepreneurs to apply for permits to build new stations, we have both information on the number of parties interested in attempting to start a new television station (through counts of the number of applications for each market) and detailed data on the success of resource mobilization (via analysis of the rate at which parties granted permits transitioned to actually broadcasting). Where most studies of entrepreneurship would only look at the end result – stations going on air, in our case – our data allows us to examine the crucial stages leading up to this event.

Although our empirical analyses do not account for geographic agglomeration per se, the results provide important insights into the underlying dynamics. Our results suggest that different processes drive the number of entrepreneurial groups interested in founding new television stations and the ease with which those groups can mobilize the resources necessary to go on air. These differences suggest that entrepreneurs may fail to perceive opportunities accurately. We further discuss which systematic psychological biases might lead to these misperceptions and how these biases may influence both the geographic distribution of production and the dynamics of local populations.

THE GEOGRAPHY OF ENTREPRENEURSHIP

The vast majority of research on the geographic distribution of entrepreneurial activity attributes these differences to heterogeneity in the attractiveness of locations. Beginning with the classic research of von Thünen (1826), a German school of economic geographers investigated the distribution of heavy manufacturing in Germany and other parts of Europe, focusing largely on the location of natural resources, such as coal and iron ore, and the need to minimize transportation costs. These geographers argued that industries clustered because all manufacturers within an industry required access to the same raw materials; within an industry, entrepreneurs looking to build new plants would find the same locations attractive for their proximity to key inputs. Though the models became increasingly sophisticated, the distribution of critical raw materials remained the epicenter of explanations of economic geography well into the twentieth century (e.g. Christaller, 1933; Greenhut, 1956; Lösch, 1940; Weber, 1928).

More recently, researchers have begun to revitalize the idea – originally suggested by Alfred Marshall (1890) – that firms can benefit by co-locating regardless of where they choose to position themselves. The stimulus for the reinvigoration of research in this tradition likely arose out of the clustering of economic activity

within high technology sectors, such as the widely publicized concentrations in the San Francisco-San Jose corridor (Silicon Valley) and surrounding Route 128 north of Boston. In these industries, both the raw materials and the finished products weigh little relative to their value, thus explanations based on the minimization of transportation costs have little power. In response to this conundrum, a group of economists have developed theories about why industries might benefit by co-locating their production facilities building on Marshall's ideas. The benefits to co-location – frequently referred to as agglomeration externalities – fall into three broad categories. First, the concentration of activities in one region can lead to an extended division of labor, resulting in employees with more highly specialized skills (Rotemberg & Saloner, 1990; Wheeler, 2001) and suppliers with products and services better suited to the needs of the firms within the industry (Piore & Sabel, 1984).[2] Second, close proximity promotes the diffusion of information from one firm to the next (i.e. information spillover). To the extent that all firms can benefit from a single firm's investments in this knowledge, these spillovers will improve the efficiency of production in the industrial district (Arrow, 1962; Romer, 1986). Third, the co-location of many potential employers can reduce wages (relative to productivity) because employees may perceive an employment opportunity as less risky if they can always move to another firm should they lose their current job (David & Rosenbloom, 1990; Diamond & Simon, 1990). For certain types of services, clustering may also allow firms to charge higher prices by reducing customer search costs (Stuart, 1979); think of the success of the mall in most American cities. Thus, several factors beyond simply the distribution of natural resources might influence the geographic distribution of industries.

Though persuasive, these arguments for the economic efficiency of geographic clustering do not clearly specify how these benefits for existing firms translate into increased founding rates in industrial districts. At least two types of processes could produce such a pattern. On the one hand, regional variation in the rate of entry may reflect rational responses on the part of nascent entrepreneurs to differences in the munificence of the various regions. Theoretical accounts of entrepreneurs' locational decisions frequently paint these individuals as scanning the environment for the site that offers the highest potential economic returns (e.g. Krugman, 1991). In other words, these explanations suggest that entrepreneurs first decide which type of business they wish to start, and then make locational decisions driven by the relative attractiveness of assorted regions. This portrait of entrepreneurial activity, however, does not match well with surveys of how entrepreneurs actually choose where to locate their fledgling enterprises, which consistently find that entrepreneurs either do not consider location or base their decisions on personal preferences rather than economic factors

(Cooper & Dunkelberg, 1987; Johnson & Cathcart, 1979; Katona & Morgan, 1952; Mueller & Morgan, 1962). An alternative account that fits better with this empirical evidence would maintain that entrepreneurs take location for granted, but decide on which industry to enter based on its relative attractiveness in the local market. Thus, observations of realized entrepreneurial attempts (firm foundings) will see these events concentrated in the geographic regions with the most attractive economic opportunities. Either explanation, however, would lead one to expect the highest rates of entry in the industry to occur in the most attractive regions with respect to firm profitability.

Empirical research does not find this expected correlation between the entry rates in various regions and the apparent economic attractiveness of those regions. The studies cited as supporting agglomeration externalities primarily come from case studies of industrial districts (e.g. Saxenian, 1994). These studies, however, cannot adequately test the theory for two reasons. First, they typically select on the dependent variable, looking only at firms that have chosen to locate within an agglomeration rather than comparing the performance of firms located within these concentrated regions to those in more isolated areas (Appold, 1995). Second, even within industrial districts, these qualitative studies frequently focus on the most prominent firms. Regardless of the average performance of firms across regions, one would expect the most successful firms in concentrated regions to perform better than the most successful firms elsewhere as a simple function of order statistics. Careful case studies cannot really answer this question.

Not only does research fail to find a positive relationship between economic attractiveness and entry, but systematic studies of agglomeration repeatedly find an *inverse* relationship between agglomeration and economic performance. For example, Glaeser et al. (1992), found slower industry growth in cities with high concentrations of employment in those industries. Appold (1995) reports that firms in agglomerations in the U.S. metalworking industry operate at a disadvantage to those in more isolated regions. In a study of the U.S. footwear industry, Sorenson and Audia (2000) find that proximity to rival shoe manufacturers dramatically increases the likelihood that a shoe plant will fail; regardless, these concentrated regions continue to experience high entry rates. The same pattern holds in high technology industries. Despite the tendency for biotechnology firms to arise in the existing agglomerations in San Francisco, San Diego and Boston, Stuart and Sorenson (2003) demonstrate that these concentrated regions offer the lowest odds of going public (i.e. selling stock to investors through an IPO) – a critical measure of success in this research intensive industry. Evidence from the literature on international expansions shows a similar pattern. Studies of foreign direct investment find that although foreign entrants tend to locate in close proximity to existing domestic firms, those entrants that situate their facilities distant from the

domestic manufacturers realize the highest returns (Chung, 2001; Shaver & Flyer, 2000). Systematic research consistently finds that the regions with the highest entry rates experience the worst economic returns – precisely the opposite of what one would expect in a world of rational nascent entrepreneurs.

Although differences in market attractiveness appear unable to explain regional heterogeneity in founding rates, two alternative conjectures might provide insight into the ways in which local market conditions affect rates of entry. First, regions may differ in the ease with which potential entrepreneurs in a particular industry can mobilize resources for new ventures. Sorenson and Audia (2000) proposed that new firms arise in close proximity to concentrations of existing firms because these firms provide incubators for nascent entrepreneurs.[3] This argument hinges on two assumptions. One, entrepreneurs within an industry arise from the ranks of employees currently working in the industry, in part because they can mobilize resources more easily. Prior experience in the trade offers potential entrepreneurs the ability to acquire tacit knowledge that might importantly influence the expected success of any new venture (Brittain & Freeman, 1980; Klepper, 2001; Klepper & Sleeper, 2000; Liles, 1974), and with it the ease of convincing third parties to contribute resources to the embryonic enterprise. Existing employees also may benefit from contacts with important constituents that can help them mobilize the resources necessary to begin operations (Borjas, 1986; Burton, Sørensen & Beckman, 2002; Evans & Leighton, 1986; Stuart & Sorenson, 2003). Two, entrepreneurs tend to found their new firms in the same regions in which they currently reside. This assumption should not surprise us as a range of personal and business relationships likely tie entrepreneurs to the regions in which they live; a number of empirical studies confirm this tendency (see Cooper & Dunkelberg, 1987; Johnson & Cathcart, 1979; Katona & Morgan, 1952; Mueller & Morgan, 1962; Sorenson & Stuart, 2001). Because the current distribution of industry constrains the opportunities of nascent entrepreneurs to mobilize resources, entry rates can remain highest in regions with dense concentrations of rivals even if these regions offer no economic benefits.

Although Sorenson and Audia (2000) attribute regional heterogeneity in founding rates to the opportunity constraints facing potential entrepreneurs, differences in opportunity perception might also explain their results. Any entrepreneurial decision involves a subjective assessment of the probability of success. Conventional conceptions of the entrepreneurial process paint entrepreneurs as rational decision-makers who weigh the expected distribution of potential returns against their own risk tolerance. Such reasoning suggests that entrepreneurs willingly accept greater risks than non-entrepreneurs. Regardless, empirical studies fail to find evidence that entrepreneurs tolerate higher levels of risk than the general population (Brockhaus, 1980). Alternately, some scholars suggest that, rather than

being less risk-averse, people who undertake risky ventures may simply perceive less risk than others to a given action. Forecasts of the risk associated with a decision depend on the context within which the evaluation occurs (Kahneman & Lovallo, 1993; Tversky & Kahneman, 1974). Even though individual actors may make rational calculations about the returns to a prospective venture, these calculations depend on subjective judgments both about local market conditions and of their own individual ability to mobilize resources (Hayek, 1945; Kirzner, 1973). Such subjective judgments, however, can fall prey to psychological biases (Tversky & Kahneman, 1974; for a survey, see Tversky, Slovic & Kahneman, 1982).

If local conditions or events lead potential entrepreneurs to over-estimate the likelihood of succeeding in creating a new venture in a region, then one may observe systematically high rates of entry into unfavorable environments. For example, Tversky and Kahneman (1974) argue that the psychological availability of events in the same class influences subjective judgments of the likelihood of it occurring. In other words, if people can easily recall incidents of a similar type (e.g. a recent organizational founding), they will assign a higher subjective probability to the likelihood of an event. In this case, the availability bias could lead potential entrepreneurs to overestimate resource availability when they observe other entrepreneurs successfully founding new stations, creating positive contagion in foundings. Overconfidence biases (Oskamp, 1965) may also lead entrepreneurs to over-react to successful foundings. Research suggests that most decision-makers overestimate the quality of their own knowledge, fail to place sufficient emphasis on the risks that exist in a situation, incorporate new information too slowly, and update too infrequently their beliefs about the likelihood of success (Bazerman, 1990; Tversky & Kahneman, 1974). In an entrepreneurial context, this suggests that while the launch of new ventures may stimulate prospective entrepreneurs to follow, these same individuals might not update their beliefs when those ventures fail at a high rate. Consistent with these arguments, Busenitz and Barney (1997), for example, find that entrepreneurs more rapidly generalize from limited experience and exhibit a greater degree of overconfidence when compared to managers.

Another potential psychological source of excess entry appears in what Camerer and Lovallo (1999) call "reference-group neglect." Camerer and Lovallo found that in playing market entry games, experimental subjects fail to adjust adequately to changes in the competitive environment, despite being given information about the likely behavior of their competitors. Rather than focus on the consequences of entry by others for overall competition, people appear to focus on their perceived superiority over rivals (Kahneman & Lovallo, 1993). Moore and Kim (2002) similarly found that subjects pay insufficient attention to the broader competitive

context when wagering on simple trivia games. Participants bet more on winning a simple trivia quiz than on a difficult quiz, despite the fact that both quizzes offered the same average probability of winning. This behavior suggests that individuals focus too much on their own ability to perform the task relative to the overall level of competition. Similar patterns appear outside of the laboratory; for example, Baum and Singh's (1996) analyses of market entry by day care center operators suggest that day care founders do not understand the implications of their market entry decisions on the competition they will face.

These opportunity perception-based explanations have received little attention in empirical research on entrepreneurship, probably because researchers lacked the information necessary to test them (for a partial exception, see Bastos & Greve, this volume; Greve, 1999).[4] Decomposing the two effects requires information both on the number of entrepreneurial attempts in an industry, as well as which of those attempts reach fruition. We take advantage of data from an unusual industry to gain insight into the degree to which divergences emerge in the determinants of opportunity perception versus resource mobilization in the entrepreneurial process.

TELEVISION BROADCASTING

The structure of the television broadcasting industry grew out of the interplay of the unique features of broadcasting as an economic activity and a series of historical and institutional contingencies, inherited in particular from the legacy of the institutional development of radio broadcasting. The high degree of governmental regulation of television broadcasting reflects the common-property nature of the electromagnetic spectrum (Olson, 1965). If more than one broadcaster transmits on the same frequency, the transmissions will interfere – making effective reception of the signals difficult, if not impossible. As a consequence, the economic value of the electromagnetic spectrum declines rapidly as competitors crowd the same range of frequencies. In the 1920s, the explosive popularity of radio led to substantial interference problems that eventually resulted in the passage of the Communications Act of 1934, which established the Federal Communications Commission (FCC) and granted it the power to control the allocation, use, and transfer of rights of broadcast frequencies. Congress has historically charged the FCC with exercising its control to ensure that the entire population can receive broadcast signals and that broadcasters serve the interests of local communities. The Commission has pursued the former largely through the setting of technical guidelines and standards and the latter primarily though its power to award and revoke broadcast license applications.

A second important structural feature of the broadcast television industry concerns its geographic localization. Broadcast signals degrade over distance. To provide a structure within which to regulate signal interference and encourage adequate coverage of the entire United States, the FCC therefore uses approximately 200 local broadcast markets as the basis for making frequency allocation decisions. Direct competition between broadcast stations only takes place within local markets; stations in New York and Los Angeles, for example, do not compete for viewers.

The FCC's regulation of television broadcasting concomitantly generates a feature important to our research design: it restricts entrepreneurial activity. Entrepreneurs cannot simply start broadcasting in a local market; instead, they must apply for and receive a broadcast license from the FCC. To limit potential interference, the FCC maintains a Table of Allotments that defines the channels on which television stations may broadcast in a local television market. Applicants need to identify a vacant broadcast channel in the Table of Allotments and file an application for construction of a commercial broadcast station. In this application, groups or corporations seeking a license from the FCC must demonstrate that they have access to the financial and technical resources necessary to operate a station, and that they do not violate existing station ownership restrictions. The FCC also requires applicants to explain how their proposed programming would serve the local community's public interest. To facilitate community response, applicants must announce their application in local newspapers and allow the public time to respond. Meeting these requirements typically incurs substantial costs, including commissions for engineering reports, legal fees and other expenses. If the FCC accepts an application, it grants the applicant a "Construction Permit," valid for two years, which allows the grantee to build a new station – to acquire equipment and erect broadcasting towers, etc. Upon completion of the construction, the grantee must then file for a permit to begin broadcasting (i.e. to go "on-air").

For our purposes, several characteristics of this application process prove useful. First, the act of application leaves a trace in the form of public records of applications filed. This means that we can measure the level of application activity and use it as an indicator of the degree of entrepreneurial interest in television broadcasting. Second, the application process entails substantial effort; applicants must provide detailed information on the technical characteristics of their proposed station, evidence of sufficient financial resources and a statement of how the station will serve public interest. We can therefore safely assume that the act of application reveals a serious intent by applicants to start a television station.

A third useful feature of the application process resides in the staging of the licenses granted by the FCC, which allows us to observe the length of the resource

mobilization stage. Not all recipients of Construction Permits (CP) successfully transition to live broadcasting, and even those that do succeed exhibit substantial heterogeneity in the amount of time that elapses between the granting of the CP and the first broadcast date. We interpret this variation as reflective of differences in the ability of grantees to mobilize the resources necessary to create the new organization. These resources include not simply financial and technical assets, but also relationships with suppliers and buyers, and in particular the recruitment of qualified employees for both management and on-air positions.

In short, the regulatory structure of commercial television broadcasting offers substantial analytic leverage because it allows us to distinguish empirically between the degree of interest in creating new television stations and the length of time elapsed in mobilizing resources. Thus, we can separately estimate the effects of various local and market conditions on the degree to which actors perceive attractive opportunities in local television broadcasting and on the ability of entrepreneurs to mobilize the resources necessary for going on-air.

Data and Measures

To investigate this issue, we collected data on applications and construction permits in the 24 largest broadcast markets in the U.S. over the period 1965–1987, selected based on their size at the end of the study period. These markets account for roughly half of all television households in the U.S.[5] Our data come from annual volumes of the *Television Factbook* (subsequently entitled the *Television and Cable Factbook*), an industry directory that contains comprehensive information on commercial television stations in the U.S. Drawing on records from the Federal Communications Commission, the *Television Factbook* tracks applications for television broadcast licenses on file with the FCC, including information on the grant date of Construction Permits and the date on which a station begins broadcasting.

Our measure of the extent to which entrepreneurs perceive opportunities in commercial television broadcasting comes from the rate of application for broadcast licenses. Our data include information on the number of new applications for a television station license filed each year in each of the 24 broadcast markets. Figure 1 graphs the total number of applications each year, across the 24 markets. As the chart illustrates, the number of filings declines in the 1970s and then rises sharply during the 1980s, coinciding with multiple technological and regulatory developments in the industry (discussed below). Because we do not know the set of people who might have applied for a television license (i.e. at risk of applying), we must rely on counts of the number of applications each year and model the application

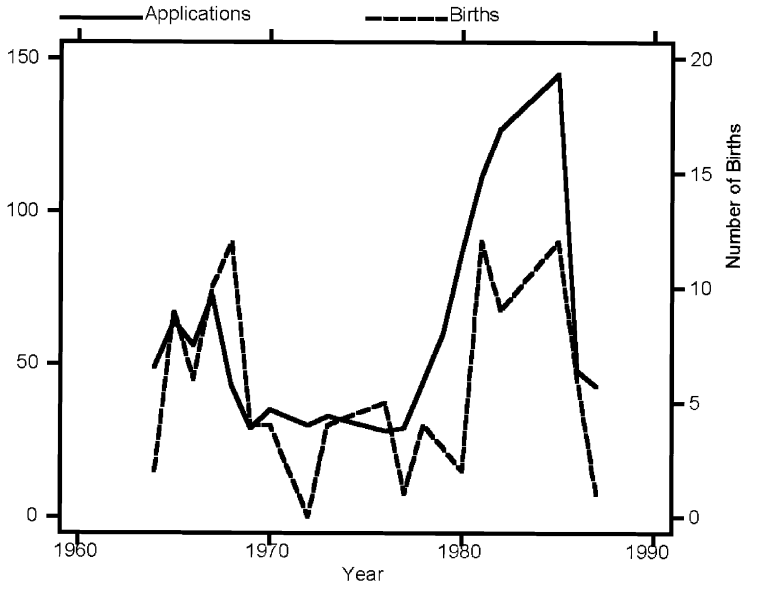

Fig. 1. Counts of Applications for Television Broadcast Licenses and Births of Stations in Sampled Markets, 1965–1987.

rate using count models. Our longitudinal design provides pooled cross-section time series data. To account for any unobserved, time-invariant characteristics of broadcast markets that might influence the application rate, we use conditional fixed-effects negative binomial models (Hausman, Hall & Griliches, 1984).

To analyze the resource mobilization process, we examine the determinants of the rate of transition to on-air status among applicants that have been granted a Construction Permit. As noted earlier, only after receiving the Construction Permit can grantees attempt to mobilize the various resources needed to assemble an operational television station, so the rate at which they succeed in going on-air should capture well the ease or difficulty with which grantees can mobilize resources. Our data include information on all Construction Permits issued in these markets over the time period, including information on the date of permit issue and the date at which the station goes on air. If the station does not begin broadcasting within three years of the grant date of the Construction Permit, we treat it as a censored observation. We model these data using Cox proportional hazard rate models because they release us from making assumptions about the form of duration dependence in the hazard rate. Again, we observe Construction Permits across multiple markets. To account for the possibility that the mobilization

rate differs systematically across markets due to unmeasured time-invariant factors, we estimate stratified Cox models, which allow the (unspecified) baseline hazard rate to vary across markets. Covariates are updated yearly.

Our empirical analyses focus on how local market conditions affect opportunity perception and resource mobilization. Regardless, we control for several national-level conditions common to all of the markets studied. We discuss these briefly here.

Histories of the television industry identify three important competitive regimes during the period of our study. The early 1970s saw significant regulatory change, particularly with the enactment of the Prime Time Access Rule in 1971 (as a result of legal challenge, however, it did not become effective around 1973). This statute limited network programming in prime time (7–11pm) to three hours Monday through Saturday, releasing one half-hour of access time formerly programmed by the networks. The Rule further prohibited network-owned and -affiliated stations from showing reruns of network programming during this released time. Industry analysts widely agree that this change strengthened the programming options for independent stations and improved their ability to compete with network affiliates (Walker & Ferguson, 1998). As this regulatory shift may have both enhanced opportunity perceptions and the ease of entry, we include a dummy variable for the post-1973 period.

By the early 1980s, improvements in satellite technology also made it much easier for independent distributors to syndicate programming to local stations. This technological development meant that local stations could program current content distributed by satellites instead of waiting for deliveries of physical tapes for syndicated content. By providing better access to original programming, satellite distribution made it much easier for independent stations to compete with network affiliates. Syndication exploded. In 1980, syndicated advertising revenue in the U.S., at $50 million, accounted for less than one-half of one percent of total television advertising revenue. By the end of the 1980s, syndicated advertising had grown to over one billion dollars, nearly five percent of all television advertising revenue. To capture the effects of this development, we mark it with a dummy variable for the post-1981 period. In addition, we include the national level of syndicated advertising revenue as a control for the attractiveness of the entrepreneurial opportunity for independent television stations (although our data include all startups, the vast majority of new stations during our period of study enter as independents).

Finally, in 1985, the FCC loosened ownership restrictions on television stations. The limit on the number of stations controlled by one owner increased from seven to twelve. The FCC also repealed the so-called anti-trafficking provision, which barred the short-term ownership of stations to prevent speculation. Another dummy variable, for post-1985, identifies this shift in the institutional environment.

Organizational ecology claims that two forces importantly influence industry dynamics (Hannan & Freeman, 1977; see Carroll & Hannan, 2000, for a recent review). Legitimation – the degree to which external parties consider a particular type of business a reasonable enterprise – expands the availability of resources to the industry; thus, one might expect both entrepreneurial attempts and the ease of resource mobilization to rise with legitimacy. Competition, on the other hand, limits founding rates. Entrepreneurs may accurately perceive that competition reduces the opportunities for profiting from entry. Similarly, competition over the resources necessary for mobilizing can increase the difficulty of actually beginning operations even among entrepreneurs that attempt entry. To capture the effects of competition and legitimation at the national level, the models include a logged density measure.[6]

The broader economic context may also influence entrepreneurship. We include a measure of economic contraction, since recession could reduce entrepreneurs' beliefs about the potential returns to a new business. The recession variable counts the number of months in the year that the National Bureau of Economic Research considered the economy to be in contraction; thus, the measure can range from 0 to 12. We also include annual measures of the Federal Reserve interest rate as a measure of the cost of capital to entrepreneurs. As a result of the endogeneity of interest rate changes by the Federal Reserve, the level of interest rates correlates strongly with the strength of the economy. Inflation can also introduce noise into the meaning of the level of interest rates because the nominal rate may not reflect the real cost of capital. To address these shortcomings, we also include the changes in the interest rate to assess the effects of the cost of capital.

At the level of the broadcast market, our models include a variety of measures of competitive conditions facing prospective entrepreneurs. The (log) number of television households, updated annually, provides an appropriate measure of market size, since stations compete for viewers. We also count the number of local television stations in each market. Although most ecological studies look at national level density measures, studies with measures of local density consistently find that other members of the population in close proximity to the focal firm generate the strongest competition (Baum & Mezias, 1992; Carroll & Wade, 1991; Hannan & Carroll, 1992; Sorenson & Audia, 2000). Potential entrepreneurs may perceive this competition and avoid entry, and, when new entrants do attempt to mobilize resources, local firms may crowd them out, thereby preventing entry. Our analysis tracks the effects of two different densities: counts of network affiliates (ABC, CBS or NBC), and counts of independent stations. Most of the entrants in our analysis attempt to bring new independent stations on-air; thus, the entrepreneurs behind these stations may consider other independents more relevant as potential rivals.

Another factor that might influence both perceptions of the ease of market entry, as well as the ease of mobilizing resources, is incumbent experience. A priori this effect does not have an obvious direction though. On the one hand, firms may become more effective competitors as they gain experience, potentially scaring off new entrants and making the acquisition of resources difficult for those that attempt entry (Barnett, 1997; Barnett & Sorenson, 2002). On the other hand, because the environmental conditions at the time of founding shape the nature of the firm (Sinchcombe, 1965), and because firm capabilities may become increasingly obsolete as they mature (Barron, West & Hannan, 1994; Sørensen & Stuart, 2000), potential entrants could view old firms as weak and decrepit; thus, incumbent experience might actually encourage entry. Our models operationalize this issue by measuring the average age of all incumbent broadcasters.

Several approaches argue for the importance of investigating the effects of the activities of other potential entrepreneurs. For example, the recent successful entry of other new entrants might generate an availability bias, leading entrepreneurs to overestimate the attractiveness of the market. Even pre-entry activity might encourage adoption. Greve (1999; Bastos & Greve, this volume) has claimed that mimetic entry plays a large role in determining heterogeneity in entry rates across locations. Lacking more detailed information on market opportunities, potential entrants might view the interest of others in the market as a signal of the market's munificence (Bikchandani, Hirschleifer & Welch, 1992). Applications may therefore rise in response to recent entry, to recent grants of Construction Permits, and to increases in applications. Thus, our models of application activity

Table 1. Descriptive Statistics.

Variable	Mean	S.D.
National level information		
Log syndicated revenue ($M)	1.704	2.589
Log national density	6.561	0.146
Recession (0/12)	0.949	2.729
Fed rate	7.598	3.410
Fed rate change	0.093	0.256
Local market conditions		
Applications	2.369	2.697
Log network affiliate density	1.214	0.164
Log independent density	1.154	0.615
Log TV households	13.857	0.683
Lag births	0.235	0.509
Active construction permits	0.347	0.588
Mean age of existing stations	17.464	4.994

include counts for each of these activities. Table 1 details the distribution of these counts, as well as the other variables used in our analyses.

ANALYSIS OF OPPORTUNITY PERCEPTION

Our analysis of opportunity perception involves regressing national and local measures of market conditions on the count of applications filed with the FCC in a particular year. Models 1 through 4 investigate which factors influence entrepreneurial interest in the television broadcasting market. Of the national level factors, changes in the regulatory environment – as measured by the period effects – had little or no effect on opportunity perceptions. Net of other factors, nascent entrepreneurs reacted strongly to increases in the number of television stations nationally, with fewer application attempts as national density increased. Since national density increases throughout the period, this effect does not seem consistent with Fig. 1, which shows that the rate of application increased in the 1980s. The growth of syndicated revenue's stimulating effect on applications, however, more than offsets the negative impact of national density. A doubling in the volume of syndicated revenue increases the application rate by more than 13% ($\exp(0.181 \times \log(2)) = 1.133$). For reference, from just 1980 to 1982, syndicated revenue tripled, increasing from \$50 million to \$150 million (Table 2).

Of the broader economic conditions, recession does not appear to have a significant effect on opportunity perception, but both the level and changes in interest rates influence applications. Although higher interest rates seem to fuel entry attempts, the level measure of interest rates has at least two potential weaknesses: (i) interest rates tend to rise in response to strong economic conditions as the Federal Reserve attempts to stave off inflation – thus, the interest rate level may capture the overall strength of the economy; and (ii) the level also conflates the real cost of capital with inflation rates. Changes in the interest rate, on the other hand, produce the expected effects on entrepreneurial interest. A one-quarter point increase in the rate decreased applications by 16–20% in each locale; considering that the Federal Reserve often makes multiple quarter point moves in a year, sensitivity to interest rates likely has a substantial effect on entrepreneurial attempts.

The models reveal even greater sensitivity to local market conditions. As one would expect, increases in the market size encourage entry. Potential entrants attend closely to the density of local competitors; however, while the local density of independents deters entry, the local density of network affiliates has no significant effect (and consistently produces positive parameter estimates), suggesting that potential entrepreneurs may perceive independents as stronger – or perhaps more relevant – competitors than network affiliates. This seems

Table 2. Conditional Fixed Effect Negative Binomial Models of Yearly Applications for Television Broadcast Licenses, 1965–1987.

Variable	(1)	(2)	(3)	(4)
National level information				
Period 1: 1973+	0.037	0.043	0.082	0.141
	(0.197)	(0.197)	(0.198)	(0.212)
Period 2: 1981+	−0.288	−0.243	−0.128	−0.196
	(0.286)	(0.282)	(0.286)	(0.299)
Period 3: 1985+	0.546	0.420	0.287	0.296
	(0.407)	(0.404)	(0.409)	(0.409)
Log syndicated revenue ($M)	0.181**	0.195**	0.152*	0.157*
	(0.063)	(0.063)	(0.064)	(0.065)
Log national density	−3.895**	−3.974**	−3.553**	−3.205*
	(1.147)	(1.138)	(1.166)	(1.250)
Recession (0/12)	−0.038	−0.035	−0.028	−0.030
	(0.026)	(0.025)	(0.026)	(0.026)
Fed rate	0.113**	0.103**	0.094*	0.101**
	(0.038)	(0.037)	(0.038)	(0.039)
Fed rate change	−0.898**	−0.840**	−0.733*	−0.769*
	(0.316)	(0.313)	(0.315)	(0.317)
Local market conditions				
Log network affiliate density	0.299	0.267	0.270	0.193
	(0.477)	(0.476)	(0.483)	(0.489)
Log independent density	−0.714**	−0.710**	−0.584**	−0.662**
	(0.161)	(0.172)	(0.176)	(0.202)
Log TV households	0.901**	0.979**	0.818**	0.878**
	(0.271)	(0.280)	(0.291)	(0.299)
Lag births		0.478*	0.557*	0.532*
		(0.204)	(0.220)	(0.222)
Lag births squared		−0.311*	−0.394**	−0.387**
		(0.122)	(0.141)	(0.141)
lag applications			0.022*	0.022*
			(0.009)	(0.009)
Active construction permits			0.171**	0.163*
			(0.065)	(0.065)
Mean age of existing stations				−0.018
				(0.023)
Log-likelihood	−687.695	−683.571	−676.054	−675.757

Note: Models include fixed effects for broadcast market.
*Two-sided t-test: $p < 0.05$.
**Two-sided t-test: $p < 0.01$.

likely during the time period under study, since all of the markets studied had affiliates of the three major networks throughout the period. Entry into television broadcasting therefore meant becoming an independent station and competing primarily with other independent stations.

Successful founding attempts in the previous year stimulate further attempts at founding. The inclusion of a squared term suggests that only the first success promotes entry attempts; by the second founding, the net effect of lagged foundings turns negative. Regardless, most markets experience only one entry in a year, suggesting that in general, applications rise in response to the appearance of new stations on the air. Both the lagged number of applications and the current number of active construction permits also exert a positive effect on the application rate. Although this pattern appears to reveal social contagion processes, these measures may also reflect unobserved factors that increase the attractiveness of entry into the market. The fact that the inclusion of these measures does not have a substantive effect on the coefficients of the other variables in the model, however, reduces our concern that this alternative may drive our results. Finally, it does not appear that prospective entrepreneurs respond – positively or negatively – to the average market experience of the incumbent firms.

ANALYSIS OF RESOURCE MOBILIZATION

To assess the factors influencing the resource mobilization process, we modeled the rate of transition to on-air status using Cox proportional hazard rate models. The estimates from these models appear in Table 3. For comparative purposes, Model 1 assumes a common baseline hazard rate across the sampled broadcast markets, while the subsequent models all stratify the baseline hazard rate by market. A comparison of the log-likelihoods for Models 1 and 2 demonstrates that the stratified model fits significant better than the unstratified model, indicating that markets differ substantially in their baseline resource mobilization rates.

Few of the factors that exerted a significant effect on the perception of opportunities have an effect on the resource mobilization process. For example, while applications reacted sensitively to the growth in syndicated advertising revenue and the interest rate environment, these factors do not affect the speed at which grantees of Construction Permits go on-air. Similarly, changes in national density and the size of the local broadcast market do not influence mobilization rates. The density of independent stations in the local market, however, does exert a competitive effect by lowering the transition rate – consistent with the negative effect it had on opportunity perception.

Table 3. Stratified Cox Proportional Hazard Models of the Transition to On-Air Status, 1965–1987.

Variable	(1)	(2)	(3)	(4)
National level information				
Period 1: 1973+	1.188	1.008	0.452	1.511
	(0.919)	(1.104)	(1.138)	(1.253)
Period 2: 1981+	−7.280	−2.351	−4.065	−5.507
	(6.171)	(6.112)	(7.325)	(7.431)
Period 3: 1985+	−0.498	−0.377	−0.645	−0.630
	(0.538)	(0.625)	(0.659)	(0.666)
Log syndicated revenue ($M)	1.608	0.743	1.077	1.230
	(1.133)	(1.131)	(1.353)	(1.383)
Log national density	−9.259	−5.551	−9.097	−4.487
	(5.097)	(6.355)	(6.953)	(7.594)
Recession (0/12)	−1.373	−0.623	−0.921	−1.030
	(0.884)	(0.862)	(1.036)	(1.049)
Fed rate	0.306	0.195	0.250	0.339
	(0.184)	(0.199)	(0.236)	(0.239)
Fed rate change	−0.633	−0.980	−1.362	−1.472
	(0.941)	(1.127)	(1.199)	(1.207)
Local market conditions				
Log network affiliate density	0.059	−0.303	−0.892	−1.036
	(1.153)	(2.519)	(2.415)	(2.507)
Log independent density	−0.844*	−2.023**	−1.373	−2.255*
	(0.413)	(0.728)	(0.780)	(0.884)
Log TV households	0.765*	1.518	2.972	2.922
	(0.305)	(1.634)	(1.804)	(1.810)
Active construction permits	0.279	0.224	0.028	−0.080
	(0.182)	(0.253)	(0.268)	(0.284)
Lag births			−1.064*	−1.597**
			(0.453)	(0.553)
Mean age of existing stations				−0.231*
				(0.106)
Stratified by market	N	Y	Y	Y
Log-likelihood	−225.332	−71.023	−67.859	−65.351

Note: *N* of permits: 148.
*Two-sided *t*-test: $p < 0.10$.
**Two-sided *t*-test: $p < 0.05$.

Interestingly, the effect of lagged births on the rate of transition to on-air status is strictly negative (we experimented with including a squared term, but it did not improve model fit significantly). This result suggests that the successful launch of a station in a market makes it more difficult for future entrepreneurs to mobilize

the resources to launch another station. This pattern stands in stark contrast to the results for license applications, which suggested that a new station launch prompted greater interest in forming television stations.

The experience of market incumbents, as measured by their average age, has a negative effect on the resource mobilization process. More experienced competitors appear to exert greater pressure on potential entrants into the market. Furthermore, incumbent experience has a large predicted effect on success: a one-year increase in the average experience of incumbents results in a more than 20% reduction in the transition rate ($\exp(-0.231) = 0.79$). Regardless, the analyses of the application process suggest that prospective entrepreneurs do not take the competitive experience of incumbents into account when assessing market attractiveness.

DISCUSSION

Although a substantial body of research in the study of entrepreneurship highlights the general fact that entrepreneurs likely overestimate their odds of succeeding, our analysis focuses on those factors that would differentiate the degree to which this asymmetry occurs from one market to the next. The overconfidence bias likely leads to an unjustified degree of optimism among nascent entrepreneurs. Though this psychological tendency almost certainly has an important effect on the rate of attempts at resource mobilization, it influences all regions equally in our models; hence, any effects of this bias appear in the constant, which we do not attempt to interpret. Our interests reside in why some regions may generate greater discrepancies than others between entrepreneurs' assessments of opportunities and the actual availability of resources in those markets.

In assessing the attractiveness of a market, potential entrepreneurs can make two types of errors: (i) they can incorrectly weight the importance of the various pieces of information available to them about the attractiveness of the market; and (ii) even in instances of properly assessing the importance of various attributes, nascent entrepreneurs may misinterpret the meaning of a particular piece of information.

To evaluate the degree to which latent entrepreneurs correctly weighted information, we estimated the relative importance of a variety of factors in the application and resource mobilization processes. The figures in Table 4 show standardized coefficients analogous to those calculated in ordinary linear regression – generated by multiplying the coefficient by the standard deviation of the independent variable (because they cannot be distinguished from zero, we do not calculate these values for factors with insignificant coefficients). If entrepreneurs made perfect assessments of how environmental conditions influenced the ease of

Table 4. Standardized Coefficients of Significant Predictors of Applications and Resource Mobilization.

Variable	Applications	Resource Mobilization
National level information		
Period 1: 1973+	NS	NS
Period 2: 1981+	NS	NS
Period 3: 1985+	NS	NS
Log syndicated revenue ($M)	0.406	NS
Log national density	−0.468	NS
Recession (0/12)	NS	NS
Fed rate	0.344	NS
Fed rate change	−0.197	NS
Local market conditions		
Log network affiliate density	NS	NS
Log independent density	−0.407	−1.387
Log TV households	0.600	NS
Lag births	0.271	−0.813
Lag births squared	−0.100	
Lag applications	0.059	
Active construction permits	0.096	NS
Mean age of existing stations	NS	−1.154

Note: NS = not significant.

resource mobilization, we would fail to see any significant values in the resource mobilization equations because each of these situations offers an opportunity for arbitrage. When resource mobilization shows significant effects in the same direction as applications, it suggests that entrepreneurs may systematically underestimate the importance of that factor when evaluating market attractiveness.

Entrepreneurs appear most inaccurate in the weightings they assign to local competitive conditions. The top five factors influencing applications (in order of importance) are: (1) the local market size; (2) national density; (3) local independent density; (4) syndicate revenues; and (5) interest rates. Although these all likely have an important influence on the attractiveness of starting a new television broadcasting station, the resource mobilization results suggest that entrepreneurs underweight two important factors when evaluating the market: the density of independent stations and the competitive effect of incumbent experience.

We have less to say about why potential entrepreneurs should underestimate the importance of these local competitive conditions. It seems unlikely that entrepreneurs find it difficult to obtain accurate information on the number of independent stations in the local market or their experience, as they must review FCC documents that contain this information to prepare their applications. Regardless,

they may not consider many of these existing stations relevant competitors. Research on cognitive strategic groups – drawing on the representativeness bias demonstrated in psychology (Kahneman & Tversky, 1972) – suggests that actors limit their judgments of direct competition to a small set of socially similar firms (e.g. Porac & Thomas, 1994). Thus, studies find that firms likely draw their competitive sets too narrowly (Baum & Lant, this volume; Gripsrud & Gronhaug, 1985; Reger & Huff, 1993). Moreover, when evaluating relevant competition, entrepreneurs may narrow their set to exclude the most experienced, strongest rivals because these competitors likely differ from their envisioned new venture more than recent entrants. Even when nascent entrepreneurs correctly identify the appropriate rivals, they may still place too little weight on this information due to reference group neglect – the tendency to focus more on one's own abilities than on the competition (Camerer & Lovallo, 1999).

Though nascent entrepreneurs underestimate the importance of the local competitive conditions, at least they accurately assess the *direction* of this signal's relationship to the local resource space; with regard to the information provided by recent foundings, potential entrepreneurs appear to interpret these signals incorrectly. Whereas a recent founding increases the number of applications by 16%, it actually decreases the likelihood of a permit grantee successfully mobilizing resources by 80%. Even a perusal of the raw data in Fig. 1 reveals this contagion effect. This pattern supports the idea that entrepreneurs perceive entry as a positive market signal without giving full weight to its implications for the competitiveness of the market. Those sitting on the sidelines in the market think that the new entrant must know something that they do not. Again, we can say less about precisely why this misinterpretation occurs. A likely culprit, however, comes in the guise of the availability bias. According to this line of research, individuals' estimates of the likelihood of events weight recent information more heavily than they should (Tversky & Kahneman, 1974). In this context, those evaluating market conditions may dramatically (and incorrectly) recalculate the odds of successful entry when they see another firm go on-air, without balancing this information against the (admittedly more difficult to observe) statistics on the number of actors attempting entry.

These errors provide insight into the dynamics underlying geographic agglomeration. Research on agglomeration consistently finds that these regions enjoy unusually high entrepreneurship rates (Bartik, 1985; Carlton, 1983; Sorenson & Audia, 2000). If potential entrepreneurs consistently underestimate the strength of local competition, that could explain why new entrants continue to enter these local markets. Entrepreneurs underestimate the negative implications for market attractiveness of both the number of incumbents as well as their degree of experience. Moreover, the contagion, in the form of recent entry stimulating

additional applications, exacerbates this problem. As other stations enter, more and more potential entrepreneurs jump on the bandwagon and attempt to start their own firms.

Though our results provide evidence that nascent entrepreneurs do misperceive certain aspects of the environment, differences in the fecundity of regions ultimately reflects the ease of mobilizing resources in a particular region more than systematic errors in the assessments of local market conditions. Contagion can widen the divergences in entry rates across regions, but it requires some initial differences in the likelihood of founding to start this process; hence, it cannot really explain regional heterogeneity in entrepreneurship. Since potential entrants appear to assess at least the meaning of other economic conditions and competitive dynamics correctly, the models suggest that constraints on the resource mobilization process primarily drive regional variation in foundings, consistent with Sorenson and Audia's (2000) propositions. Our findings have two primary implications for future research: (i) the analysis of counts of entries can usefully inform our understanding of the resource mobilization process; however, (ii) researchers should perform these analyses using estimation procedures that explicitly account for contagion (for a review of count models that allow for contagion, see Barron, 1992).

Clearly, the nature of the study limits to some degree the strength of the conclusions that we can make. Regardless, these limitations likely make our results more conservative. For example, the FCC may actively manage the granting of permits in such a way that permit grants reflect economic conditions more accurately than entrepreneurial interest (measured by applications). Without this regulation, many additional factors might reveal systematic bias in potential entrants' evaluations of market attractiveness. Regardless, we chose not to model the granting of applications themselves recognizing that the process might well depend of a variety of difficult to measure political factors as well as economic conditions. In addition, the local nature of the market makes the underestimation of local competition all the more surprising. If nascent entrepreneurs misjudge the importance of incumbent rivalry in markets characterized by local product competition, these discrepancies may well be even more severe in industrials with national or international product markets, where local competition occurs more subtly in factor markets.

The results also speak interestingly to our understanding of the fragility of the Red Queen in organizational evolution. Barnett and his colleagues (Barnett & Hansen, 1996; Barnett & Sorenson, 2002) have proposed that diffuse competition can stimulate organizations to adapt and improve their operations more rapidly than they would in isolation (i.e. a local monopoly). Barnett and Sorenson (2002) revealed that, at the population level, this process appears to generate formidable barriers to entry; the potent competitive strength of the incumbent

firms, developed through this Red Queen evolution, presumably either deters potential entrepreneurs from attempting entry or substantially increases the difficulty of the resource mobilization process. These entry barriers, however, seem quite fragile. When a new firm does enter the market, the entry barriers break down rapidly.

Our findings suggest that much of the strength of the Red Queen in erecting entry barriers comes from the combination of its influence on the resource mobilization process and its concomitant impact on potential entrepreneurs' assessments of opportunity in the local market. The time to on-air models reveal that incumbent experience makes it more difficult for entrepreneurs that attempt entry to mobilize the resources necessary to enter the market. By reducing the rate of actual entry, the Red Queen also generates a type of psychological barrier to entry: entrepreneurs appear to interpret the lack of entry as evidence of the unattractiveness of the market. The reduction in mobilization attempts further depresses future attempts, as contagion no longer stimulates applications, psychologically magnifying the perceived difficulty of mobilization. On the other hand, once successful entry does occur, contagion accelerates the unraveling of entry barriers.

Although these average effects produce interesting industry-level phenomena, potential entrepreneurs also likely vary in their susceptibility to these biases. For example, Baum and Lant (this volume) find that the hotel managers with either very little or a great deal of experience most commonly make errors in assessing their relevant competitors. A similar type of experience effect may differentiate nascent entrepreneurs – for example, leading those inexperienced in an industry to make the largest errors in assessing local market conditions. Two types of processes could generate such an effect. First, experience might provide individuals with better tools for interpreting the information that they receive. Second, experience in an industry might correlate with the availability of social networks providing access to private information regarding market conditions. An interesting line of future research, therefore, might investigate the relationship between these individual and positional attributes and opportunity perception.

This study provides but a first look at the importance of opportunity assessment to the dynamics of populations; however, we believe that it has usefully drawn attention to some of the systematic biases that may lead markets to deviate, at least temporarily, from efficient outcomes. Though our results support the validity of estimating models based only on successful foundings as a means of studying variation across regions in the ease of resource mobilization, we also find strong evidence that systematic decision-making biases play a role in market entry decisions. Pathways for future research include designing studies that could distinguish which of decision-making biases operate when, or among whom – individuals might interestingly differ in their susceptibility to these biases as a

function of either their position in a social network or their past experiences. Regardless, we believe that this study, more generally, points to the potential benefits of inculcating strategy with a better understanding of the psychology of decision-making.

NOTES

1. Stuart and Sorenson (2003) demonstrate a similar dynamic in the U.S. biotechnology industry. Several additional studies confirm the relationship between local concentrations of existing firms and founding rates (e.g. Bartik, 1985; Carlton, 1983); however, as these studies fail to investigate performance, a wide range of theories might explain their results.
2. Although not typically mentioned in the literature on industrial agglomeration, Durkheim (1893) also argued that density leads to an increasing degree of specialization; however, he argues for a distinct driver for this differentiation.
3. Although Sorenson and Audia (2000) only investigate founding rates within the U.S. footwear industry, multi-industry studies point to the ubiquity of the tight correlation between the rates of entrepreneurship and the location of existing firms (Bartik, 1985; Carlton, 1983; Head, Ries & Swenson, 1995).
4. These papers attribute the locational decisions of Japanese firms entering Europe to the perceived attractiveness of regions garnered from the actions of previous entrants. Regardless, these studies lack information on attempts at entry and performance, so they cannot clearly distinguish between mimetic isomorphism and resource constraints.
5. The sample includes Atlanta, Baltimore, Boston, Chicago, Cleveland, Dallas-Fort Worth, Detroit, Hartford-New Haven, Houston, Los Angeles, Miami-Ft. Lauderdale, Minneapolis-St. Paul, New York, Orlando-Daytona Beach, Philadelphia, Phoenix, Pittsburgh, Sacramento-Stockton, San Diego, San Francisco, Seattle-Tacoma, St. Louis, Tampa-St. Petersburg, and Washington D.C.
6. Following the tradition in ecological studies, we investigated non-monotonic density effects by estimating models with both density and its square. These investigations, however, revealed that national density had a monotonic, though non-linear, effect on foundings.

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