Organizational Birth Frequencies: An Empirical Investigation

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This paper examines organizational birth frequencies in 70 urban-metropolitan areas of the United States. Birth frequencies in three selected industries (plastics, telecommunication equipment, and electronic components) were related to attributes of the urban ecology and the abundance of socioeconomic resources. The results showed that occupational and industrial differentiation, the percentage of immigrants, the size of the relevant industry, the size of the urban area, and the availability of financial resources were most critical for predicting the creation of new organizations. The results are reported and interpreted within the framework of human ecology.•

Organizational theorists have shown relatively little interest in the creation of new organizations. The widespread concern for environment as a source of explanation for organizational process and structure has focused on the adaptation of existing organizations to their current environment, yet it is somewhat surprising that research on the organization-environment relationship has not triggered a greater interest in the phenomenon of organizational birth. The act of creation itself may be contingent on the attributes of the socioeconomic setting from which the organization emerges. Furthermore, the entrepreneurial act involves a commitment to a location that constrains the organization geographically. Other decisions at the time of creation imply a selection of markets or domains, the acquisition of equipment and other resources, and the recruitment of members, which impart a distinct and enduring posture toward the organization's environment. Organizational viability might be a function of those inert and early acquired characteristics and their compatibility with environmental conditions. Although it is true that an organization can change and display flexibility to environmental modifications, it is cast into an initial mold that is discernable during the rest of its life. An understanding of its creation could, therefore, foster deeper insights into the subsequent relationship between the organization and its environment.

A widely cited paper by Stinchcombe (1965) represents one of the first comprehensive attempts to document the rise of new forms of organizations. Stinchcombe reviewed the social, economic, and political conditions that account for spurts in new types of organizations. Recently, others have joined in dealing with the creation of organizations possessing certain traits, which tend to prevail in environments with a particular infrastructure (Hannan and Freeman, 1977; Aldrich, 1979; Brittain and Freeman, 1980; Marrett, 1980). The acquisition of organizational attributes, isomorphic with those of the environment and selectively retained by the organization in response to environmental pressures, has rarely been studied but promises to become increasingly prominent in the literature as the recent upswing in this line of research continues (Meyer, 1978).

Much of the older research on organizational birth can be found in the literature on entrepreneurship, but that research does not explicitly address the environmental antecedents of organizational birth. In this literature, the focus has been primarily on individuals as founders of new firms. For example, psycholo-

0001-8392/82/2701-0120/$00.75

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Part of this research was supported by a small grant from the Small Business Administration at Carnegie-Mellon University, Pittsburgh, and a Faculty Research Supplement from the Columbia Graduate School of Business. The assistance of John G. Ball is highly appreciated. Peter Blau, James Lincoln, Ian MacMillan and Michael Tushman provided helpful comments on an earlier draft of this paper.

gists have attempted to formulate statements about the personality characteristics of entrepreneurs (e.g., McClelland, 1965), or they have made comparisons between the attributes of entrepreneurs and comparable nonowner managers (e.g., Litzinger, 1965; Howell, 1972). Economists are more diverse in their treatment of entrepreneurship, but the prevailing theme has been the entrepreneur as a risk-taking agent who disrupts economic equilibrium by successfully introducing technological, commercial, and organizational innovations (e.g., Schumpeter, 1934; Deeks, 1976; Leff, 1979). Some sociologists have investigated whether entrepreneurs are individuals whose strong achievement needs are thwarted by social barriers, so that they seek alternative, nonconventional means of upward mobility (e.g., Gould, 1969). The entrepreneur, then, can be studied from a variety of perspectives that attend to his origins, his character, his role in economic history, and his impact on the environment.

This paper takes a different approach, in that it focuses on the formation of new firms in relation to their environments, rather than on the individual founders. Specifically, it explores the urban conditions that stimulate entrepreneurs in particular industries. The study may be labeled ecological in that it deals with the urban-territorial conditions pertinent to organizational birth. The term ''ecological'' is invoked to differentiate this paper from exclusively economic and psychological approaches and to stress the use of the urban-metropolitan area as the unit of study. It resembles work that has tried to explain the urban correlates of human behavior in general and of organizational behavior in particular (e.g., Hoover and Vernon, 1959; Hawley, 1971; Lincoln, 1977). The research by Hawley, (1971) in which he conceptualized urban communities in terms of populations of organizations with distinct collective structures, is especially germane. They are systems that support a configuration of organizational populations.

URBAN-METROPOLITAN CONTEXTS

According to Hawley (1950), it is not the individual but the corporate unit that forms the building block of community structure. As he stated: ''the corporate unit is essentially a producing unit: it is the responsible agency for the production of goods and services. The dynamics of the community, as manifested both in its day to day operations and its change in response to altered conditions, are traceable to its corporate units'' (1950: 210–211). The urban-metropolitan areas accommodate a community of organizational populations whose interrelationships can be traced to their interplay and the availability of resources. A horizontal and a vertical division of labor exist in such areas. Horizontal, or functional, division of labor has been widely discussed and forms an important concept in the formation of organizational taxonomies, most notably industrial classifications. Organizations are also stratified vertically, most clearly in terms of size, power, and resources (Hawley, 1950).

The fundamental assumption of this paper is that urban communities can sustain a certain degree of organizational diversity within the confines of a relatively small area; these urbanized and organizationally differentiated environments provide supportive networks through which small, new organizations find

resources. Thus, it follows up on such studies as Hoover and Vernon's (1959), which examined the capacity of the New York City region to breed innovative new firms. They pointed to the urbanized core of that area as an incubator for small firms, where organizations could have immediate access to one another and to support services such as public facilities and information sources. Therefore, it appears highly appropriate to treat urban areas as units of study for the start-up of new firms.

Urban areas, however, present unit-of-analysis problems. There are difficulties in segregating the city from its regional or national embeddedness. For example, taxation, governmental regulation, and other constraints have an impact that often does not coincide with civic or geographic boundaries. The availability of some resources, such as capital and the disposability of industrial output, often extend beyond metropolitan limits. These examples show that cities might not be sufficiently aggregative to be the appropriate unit of analysis.

Several entrepreneurial studies, however, corroborate the contention that urban areas have significance for the start-up of new organizations (Cooper, 1973; Deeks, 1976). In his study of Palo Alto, Cooper (1973) found that the overwhelming majority of new firms were created by native entrepreneurs. In contrast to the purely economic argument (e.g., Alonso, 1975), which holds that entrepreneurs tend to locate in those areas that are most advantageous economically, Cooper indicates that the founders of new firms begin their ventures where they are already living and are rarely attracted to other parts of the country even when economic factors such as the cost of transportation might be more favorable elsewhere. Entrepreneurs, it seems, forego a strict location cost-benefit analysis when they have decided to start a new venture and select the area in which they are entrenched and with which they are most familiar. A stranger might be severely impeded if he or she wanted to enmesh him or herself in a local economy that is unknown and unexplored. The classic study of Hoover and Vernon (1959) likewise suggested that as the urbanization of areas increases, they become more congenial for local entrepreneurs who find local, idiosyncratic niches, due to agglomeration economics. The very diversity of organizations triggers the initiative of local entrepreneurs to fill those niches.

Alternative units of analysis include industries or organizational populations such as the U.S. semiconductor industry (Brittain and Freeman, 1980), capitalist, cross-national economies (Freeman, 1976), centrally planned economies with the second or underground economy in post-Nagy Hungary (Rupp, 1981), and less developed countries (Leff, 1979). Implicit in all these studies is the stress on macroeconomic or industry-wide factors that account for the rise of new firms. Such studies complement rather than nullify other studies that have examined smaller units, such as regional or urban entities, for their importance for new organizations (Hoover and Vernon, 1959; Vernon, 1960; Pred, 1966; Thompson, 1966; Hawley, 1971). Even if few firms obtain some of their inputs from a national as opposed to a local market, the urban area still might be important.

More generally, we can subsume these level-of-analysis problems under Freeman's (1978) treatment of the "unit problem in

organization research." The appropriate level of analysis might vary with respect to the type of new organizations. For example, the creation of small grocery shops should probably be studied at a much lower level of aggregation than manufacturers of photographic equipment or electronic chips. It might also vary with respect to the independent variables included in the model. A predictor such as local labor supply might be more germane to the urban level of analysis, than, for example, interest rates or changes in corporate taxation.

Because the environment is the unit under study, the best level of analysis hinges on the level at which most environmental birth activity occurs for the category of organizations considered. Thus, for the investigation of small proprietorships by Aldrich and Reiss (1976), for example, the neighborhood was probably the most suitable. Even if most birth activity occurs at the urban level, however, it is possible that some nonurban variables are important predictors. For example, scientific breakthroughs, or changes in federal taxes (supraurban level of analysis), or the amount of property tax assessment (intraurban or sub-urban level of analysis) might be relevant antecedents, but they cannot be mapped onto urban levels of aggregation, since their variation does not strictly coincide with urban boundaries. In the research reported here, not only urban but also interurban and intraurban factors are related to the start-up of new firms.

Although urban-supraurban distinctions will always remain arbitrary, these difficulties have been partly resolved by the conceptualizations of Christaller (1966) and Blau (1977). Christaller, in his study of urban dispersion in Southern Germany, concluded that city location is largely determined by a territorially induced division of labor. The spatial differentiation into cities and towns of varying size is largely predicated on their economic contribution to the national economy. The differentiation follows a hierarchical, inclusive clustering principle in which successively larger cities supplement their smaller counterparts. Blau (1977) recently developed a social differentiation argument analogous to Christaller's but at a more abstract level: heavily urbanized areas show higher degrees of diversity. The reasoning of Christaller and Blau would suggest that increasing city size indicates that threshold markets are reached for establishments providing increasingly higher order and more specialized goods and services (cf. also Duncan et al., 1960).

Urban communities are semibounded systems whose conditions may stimulate the formation or location of new firms, depending on local conditions as well as on their interconnectedness with other parts of the interurban network. Cities that are a central hub of an interurban network render various entrepreneurially relevant resources more accessible than do more peripheral cities. The significance of urban centrality varies to the degree that a new organization draws on resources that originate from several other cities. A "cosmopolitan" organization is much more dependent on the interurban communication structure than is a "local" organization.

Lieberson (1961), an urban sociologist, provided an interesting illustration of this point in his study of the division of labor among banks. He found that in big metropolitan areas the large financial institutions focused on extralocal transactions,

whereas the smaller banks limited their business to the local capital markets. This division of labor existed, however, only in metropolitan areas with important financial activities. In cities with less financial activity, no such division of labor was noticeable. We would expect that highly differentiated urban areas are more self contained socioeconomically and therefore have a greater local significance than do more homogeneous areas. A city with a highly specialized manufacturing base is much more dependent on accessibility to other cities than is a city with a very diversified manufacturing base (Lincoln, 1977, 1979). Therefore, it is clear that we should consider interurban networks when accounting for local entrepreneurial activity.

It is also useful to point to lower levels of aggregation, that is, intraurban units such as the central city and the suburbs. Urban communities are often too broad to be used to define entrepreneurially relevant contexts. Intrametropolitan relocation patterns (James and Struyk, 1975) and changes in business ownership (Aldrich and Reiss, 1976) show alterations in the urban-spatial density patterns of business organizations. The territorial and socioeconomc mosaic of organizational populations may change under the influence of the decreased functional importance of the central district or the changing racial-ethnic composition of the residential population. Such findings imply that intrametropolitan variations in structural or spatial conditions can sometimes outweigh the significance of conditions at the urban level.

HYPOTHESES

Entrepreneurial Conditions of Urban Areas

The considerations of the unit of analysis suggest that the urban influence on the formation of new organizations should be studied from three vantage points, interurban, urban, and intraurban, since the maintenance and growth of organizational populations in an urban area hinge on factors associated with each of these levels.

Interurban level. In a macro-social sense, cities are the components of an interdependent system based on a division of labor, trade relationships, and formal interorganizational, interurban linkages (Duncan and Lieberson, 1970). Abrahamson and DuBick (1977) showed a "pattern of urban dominance" in the U.S. Urban dominance has two interrelated meanings. It refers both to cities as centers of important activities and to cities as hubs in an interurban network. The network derives from the division of labor among them and has implications for the differential ability of cities to influence each other's activities. Dominant cities enjoy better access to resources that are not created locally. The centrality, or dominance, of urban communities might affect birth rates because it contributes to the diversity of the local community structure. It is also plausible to speculate that even if local considerations were not relevant for organizational birth, urban centrality might be, because it renders other urban areas more accessible. This might be particularly crucial for organizations whose environmental reach is more national or international than local. Therefore:

Hypothesis 1. There is a positive association between urban dominance and organizational birth rates.

Urban level. We distinguish three important aspects of the urban area that may affect organizational birth frequencies: size, differentiation, and change. Several social scientists noted that urban size is probably a very important predictor of organizational birth activity (e.g., Pred, 1966; Thompson, 1966; Aldrich, 1978). Thompson listed several reasons for the "urban size ratchet." Larger cities enjoy comparatively more influence over state and federal governments, and a greater share of their economy is oriented toward customers than toward sources of supply. Their comparatively higher degree of differentiation fosters better than average growth. Since entrepreneurial activity is probably associated with innovation, larger cities probably show higher organizational birth rates. Thompson also dealt with a countertrend of urban size and expansion, analogous to the phenomenon of the organization growing while the growth rate of its administrative component decreases (e.g., Berry and Kasarda, 1977). It is assumed here that the effect of urban size is not linear, but curvilinear. Some urban areas reach a point in their growth curve beyond which entrepreneurial activity grows at a decreasing rate. The sustenance of a particular area might diminish because of congestion and overextension of the local resource base (Poston, 1980). Therefore:

Hypothesis 2. Organizational birth frequencies increase at a decreasing rate as a function of urban size.

Urban differentiation. This attribute of ecological structure is usually associated with size, since cities with larger populations tend to be more differentiated (e.g., Lincoln, 1978). The greater the population, the larger is the number of economic, occupational, and territorial categories or individuals and organizations. A city is differentiated to the extent that its elements (i.e., individuals or organizations) belong to different and overlapping or nonoverlapping segments (Blau, 1977). For example, the greater the number of occupations and the greater the dispersion of people over these occupations, the higher is the occupational differentiation. Urban differentiation measures for organizations can be developed on the basis of organizational structure, organizational activity, and normative orders (Hannan and Freeman, 1977), for example. In general, any dimension that allows a researcher to partition organizations into relevant subsets may be used. Type of industry or product appears to be the most convenient attribute for determining differentiation among industrial organizations. Type of economic activity is recorded by the U.S. Bureau of the Census and can be used as an indicator of economic differentiation.

Theoretical reasons for expecting higher levels of organizational births in differentiated urban communities have often been stated in terms of external economies (Vernon, 1960; James and Struyk, 1975). The diversity of organizational life gives rise to the need for small, new firms to provide supplies and consumables that cannot be manufactured efficiently at the local site of the firms themselves; they often contract out the production of specialized goods or services. The many specialized firms in urban areas collectively constitute the "external economies" of urban communities. It is plausible to state that such external economies are more prevalent if the economic base of an urban community is diversified; in industrially homogeneous communities, there may be scale

economies among the firms involved, so that the external economies do not flourish. It is also plausible to assume that urban areas with extraordinarily high levels of differentiation are very fragmented and that the existing clusters of firms are too small to sustain a viable critical mass from which new firms can spin off.

In a related argument on the relationship between differentiation and entrepreneurial activity, entrepreneurship is seen as a manifestation of marginal subgroups, which are a typical by-product of urbanization (Aris, 1970; Bonacich, 1973; Deeks, 1976). These studies have primarily dealt with minorities such as Jews, Quakers, Cubans, and Chinese, or with subcultures of scientists and engineers in certain technological fields. Aris (1970: 232–234), for example, traced the Jewish propensity to entrepreneurship to their history, through which "they have inherited a whole system of values which, when combined with the environment in which they found themselves, had led them to behave in quite specific and identifiable ways." Presumably, they satisfied their desire for independence by establishing their own firms. Bonacich (1973) provided a more general perspective in her theory of "middleman minorities," which hinges on the temporary settlement of cohesive, solitary immigrant groups, held together by a strong belief that they will eventually return to their country of origin. Thrift and gravitation to economic liquidity can help them realize this long-term objective, while the hostile reactions of the host society further reinforce their reluctance to assimilate. The term "middleman" refers to their economic role in society; they typically act as intermediaries between producer and consumer, employer and employee, owner and renter, and elite and masses. The behavior of individual members has to be understood in terms of the role that the host society imposes on the minority.

Both the theories of external economies and middleman minorities represent an elaboration on the earlier articulation in this paper of the urban community as an ecological entity whose populations of organizations interrelate with one another, thereby sustaining their collective order. We postulate that it is the scale economies of large, diverse cities that make possible the existence of external economies or middleman minorities in a sufficient critical mass. It is therefore stipulated that, holding city size constant, urban differentiation should not be too extensive, since beyond a certain threshold the critical mass needed for external economies or middleman minorities would diminish. Under these conditions, it is expected that urban differentiation has a decreasing marginal effect on birth frequencies. Therefore:

Hypothesis 3. An inverted U-shaped curvilinear relationship exists between urban differentiation and organizational birth frequency.

Urban change. The third aspect at the urban level is urban change, which either can be equated with "trend" (upward or downward) or can reflect "unpatterned variability" in social or economic behavior. Change as upward or downward trend may not convey the notion of disequilibrium; rather it may be that disruptive, discontinuous change indicates a condition of turmoil.

During a period of volatility there may be a decline in social control, an erosion of norms and values, and a deinstitutionaliza-

tion of behavior. The corresponding anomie triggers nonconventional entrepreneurial activity, which is facilitated by the inferred social disintegration. As creators of new organizations, entrepreneurs may be viewed as either the antecedents of ecological change, capitalizing on disequilibrium, or as the agents that reestablish equilibrium. Longitudinally, urban change erodes the steady state or represents a move to a new steady state, and entrepreneurial activities reflect such changes. Peterson (1981: 68) summarized the mutual influence of entrepreneurial activity and urban change rather well when he stated "Each act of equilibriating entrepreneurship has disequilibriating consequences as well." Therefore:

Hypothesis 4. Volatile, unpredictable change in an urban area is positively related to the birth frequency of new organizations.

Intraurban level. At the intraurban level, it is useful to focus attention on characteristics of organizational "populations" such as industries. These characteristics are probably more relevant to organizational births than are aspects of territorial subsystems, such as central district and suburbs. The characteristics considered here are industry size and industry size distribution.

Carlton (1978) found that the creation of new firms was highly dependent on the population size, or what he called "agglomeration economics," as measured by production man-hours in two-digit industries. Indeed, the organizational population can be viewed as the pool of potential entrepreneurs, if it is assumed that the founders of new organizations are primarily recruited from the labor force employed by the pertinent population. It follows that the greater the population, the bigger the pool of potential entrepreneurs and, therefore, the higher the birth level. The study of the entrepreneurial conduciveness of urban areas can thus be an attempt to explain variations in organizational birth frequencies that are either due to "agglomeration economics" or to the favorableness of the urban environment.

Hypothesis 5. The greater the organizational population, the higher the birth frequency in that population.

Size distribution is the second relevant attribute of the intraurban level. In industrial economics, size distribution is often considered the most important aspect of industry or market structure. Size distribution, as measured by the market concentration ratio (e.g., Scherer, 1970), signals the difficulty that new firms will have in entering a market. Concentration is high when a disproportionately small number of organizations dominate the market, for example, by jointly possessing a very large market share. High concentration ratios indicate firms with large minimum efficient size and, hence, high barriers to entry. Although concentration ratios are highly aggregative and somewhat too gross for predicting birth frequencies, they are likely to be a factor in understanding interindustry differences in business start-ups.

Hypothesis 6. The concentration of organizational populations is negatively associated with birth rates.

Richness

A discussion of the entrepreneurial conduciveness of urban areas would make little sense unless we consider not only their

ecological structure but also the availability of resources. Naturally, the ecological structure is a function of the levels of available technology, the physical and social environments, and the demographic makeup of the inhabitants. The supply of pertinent resources affects the "carrying capacity" (Hannan and Freeman, 1977) or "sustenance" (Poston, 1980) of the environment. Some demographers (e.g., Sly and Tayman, 1977) have suggested that environmental factors may become increasingly important when urban communities evolve to higher levels of complexity. In other words, environmental conditions such as the availability of space, transportation, and energy may become much more important than the ecological structure of cities in preserving a certain pattern of growth. The present study focuses not only on the resources that originate with the "sustenance organization" (Poston, 1980), that is, resources that sustain external economies, but it also explores the importance of environmental "generic" resources, for which every firm or population of firms competes (e.g., land, space, technology, ideas, capital). More specifically, these resources are both economic and social and include the availability of investment capital, energy, scientists, engineers, and other types of labor, as well as the presence of colleges and universities, which diffuse innovation and are a proximate source of high-quality employees. Therefore:

Hypothesis 7. Price and accessibility of these resources are related to organizational birth frequencies.

By way of illustration, the supply of venture capital or other sources of risky investment capital may be instrumental for new business start-ups (Johnson, 1978). Wage rates and the cost of energy can adversely affect birth rates, especially for labor-intensive or energy-intensive industries. The availability of a well-educated labor force and the preponderance of professionalism may also enhance the creation of new organizations (cf. Stinchcombe, 1965). For example, the presence of a large pool of scientists and engineers probably fosters the birth of high-technology firms in the area. This paper considers such aspects of urban environments in the attempt to explain organizational birth frequencies.

METHODS

Organizational birth frequencies were determined for three 4-digit Standard Industrial Classification (SIC) industries in 70 Standard Metropolitan Statistical Areas (SMSA) during the period 1967–1975: Fabricated Plastic Products (SIC 3079), Communication Transmitting Equipment (SIC 3662), and Electronic Components (SIC 3699). These industries show a comparatively high birth rate (Carlton, 1978). Data on birth frequencies were collected from Dun and Bradstreet's (D&B) annual files. D&B began to preserve and maintain their annual files in 1966, so birth information for earlier periods cannot be ascertained.

Births were determined by comparing entries from one year with those of the following year. Whenever an entry appeared that did not exist in the previous year's file, it was classified as a new firm, but only after it could be shown that the entry was not due to a change in name, legal status, location, or to a file maintenance error. All pairwise inconsistencies were checked with alternative publications such as trade association volumes

and telephone directories. If the information on births was not accurate enough, the SMSA was eliminated from the sample.

For each of the 70 SMSAs, several files of firms were formed. For all establishments that could be located for any pair of contiguous years between 1966 and 1975, the physical address fields in their Dun and Bradstreet Market Identifier records were compared. If the data in this entry field were similar, the firm was coded as "nonmover." If the address fields were not identical, the firm was coded as a moving establishment. For the present study, the data involving new establishments had to be refined so that the firms could be flagged as to whether they were branches or subsidiaries of other organizations or were merely additions to Dun and Bradstreet coverage because they existed before any pair of two years. Thus, a firm created in 1950 and listed in 1975 might not have been listed in 1974. In that case, the firm was simply added to the 1974 file and would, therefore, not activate the computer program's flag.

New firms enter into a D&B file as soon as they engage in some transaction that triggers a business inquiry about their creditworthiness. This entry-trigger renders D&B data attractive for researchers, since it ensures the exclusion of nonactive firms, such as tax shelter enterprises and ventures that have remained dormant during their life. Size is not a criterion for inclusion. As soon as an organization, especially a small, hitherto unlisted organization, applies for a loan, a lease, or initiates another exchange relationship, it is likely to be reviewed by D&B investigators. D&B-listed firms also include single proprietorships and partnerships, as long as they perform as "real" organizations, that is, engage in external transactions. New subsidiaries were excluded from this study. Thus, the birth information pertains to genuinely new ventures. The obvious bias of the D&B data is probably not severe for the high-technology types of new ventures examined in this paper. It is likely to be more pronounced with respect to new but dormant organizations, tax shelter-inspired companies, and very small firms owned by moonlighting individuals.

The SMSA information on organizational births was created by the National Bureau of Economic Research.[1] The bureau surveyed all SMSAs but discontinued a tedious task beyond a very low point of diminishing returns.[2]

Finally, it should be noted that in 1971 the Standard Industrial Classification was modified. The Bureau of the Census altered some codes in such a way that some firms acquired a different classification number. Although the definition of Telecommunication Equipment (SIC 3662) remained unchanged, the other two categories considered in this study were redefined. In 1972, nine percent of the firms in SIC 3079 (Plastic Products) and 35 percent of the firms in SIC 3079 (Electronic Components) were reclassified. The effect of reclassification could be significant for the last category, from which 35 percent of the firms were eliminated. The presently available information does not permit identification of those firms that belonged to a different SIC before 1972. Thus, it is not known whether the excluded organizations were more likely to have emerged in some SMSAs rather than in others. The differences in classification criteria made the split into two time periods inevitable. It also resulted in the decision to measure independent variables

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The help of Dennis Carlton and the National Bureau of Economic Research in making the birth data accessible is highly appreciated.

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A complete listing of the 70 SMSAs and their organizational birth frequencies in the three industries is available from the author on request.

for each of the two time periods before the data could be pooled.

Independent Variables

Information about the independent variables applied to two time periods whenever available, since the data on organizational birth frequencies pertained to the periods 1965–1971 and 1972–1975. Urban centrality in the interurban network was measured with an index of three standardized, highly interrelated variables: the number of scheduled airline departures (U.S. Federal Aviation Administration, 1974), the number of national headquarters in a city (Encyclopedia of Associations, 1970), and the location of a branch of the Federal Reserve Board. This measure is somewhat analogous to "urban dominance" as reported by Abrahamson and DuBick (1977).

At the urban level, six independent variables were employed: size, occupational differentiation, industrial differentiation, percentage of domestic immigrants, percentage of foreign immigrants, and economic volatility. The size of the SMSA was measured by the number of people in the areas, as indicated by the 1970 Census (U.S. Bureau of the Census, 1972b).

Occupational differentiation was based on the distribution of individuals among 20 occupational categories (e.g., professional, technical, health workers, teachers, managers, administrators, salaried employees, etc.), as reported by the 1970 Census (U.S. Bureau of the Census, 1972b). Industrial differentiation was measured by the distribution of value-added manufacture over 21 two-digit industry classes (SIC 19 to SIC 39), as reported by the U.S. *Census of Manufacturers* in 1967 and 1972 (U.S. Bureau of the Census, 1971b, 1976). These two differentiation measures were computed with a formula described by Gibbs and Poston (1975):

$$D = 1 - \frac{(\sum_{i=1}^{n} | x_i - \bar{x} |)/2}{\sum_{c=1}^{n} x_i},$$

where D stands for differentiation, and x_i is the number of observations (individuals, units of value-added) in the i^{th} category, and $\bar{x}$ is the average proportion of units over i categories.

Domestic immigrants were the percentage of the 1970 SMSA population who resided in 1965 outside the 1970 SMSA. Foreign immigrants were the percentage of SMSA individuals who had immigrated from abroad into the SMSA (U.S. Bureau of the Census, 1972b).

Economic volatility was determined by first ascertaining the trendline in persons employed in industry over the period 1959–1972 (U.S. Bureau of the Census, 1961–1974). This was done by regressing time on industrial employment, so that, for each of those years, actual and predicted values for every SMSA were obtained. The variance in the difference between actual and predicted employment (i.e., mean square error) was then computed and treated as tapping economic volatility. If an urban area shows stable increments in growth, the differences between those values are close to zero. If there are major discrepancies, the area is more volatile. The underlying assumption was that if a smooth trend was witnessed in an urban

area, the area enjoyed stability and economic equilibrium, whereas frequent and major departures from the trendline reflected instability.

There were two measures of industry characteristics, size and the size distribution of the relevant organizational population. Size distribution was determined by computing the concentration of employment in firms of different sizes as reported in *County Business Patterns* in 1967 and 1972 (U.S. Bureau of the Census, 1969b, 1974b), based on the so-called Herfindahl index:

$$C = \sum_{i=1}^{U} x^2_i ,$$

where x_i stands for the proportion of firms in the i^{th} size category. The size categories were 1–5, 6–25, 25–50, 50–250, and more than 250 employees. All SMSAs showed a chi-square distribution with the volume of smaller firms much greater than that of the larger firms. This Herfindahl index indicates, therefore, the degree to which smaller firms prevail in a SMSA. The higher the index, the more concentrated is the employment in small firms. For many SMSAs, information incorporating this level of detail was not available for four-digit industries, as this information is often withheld by the Bureau of the Census to protect confidentiality. Therefore, it was decided to treat as relevant populations the corresponding two-digit industries, that is, SIC 30 (Rubber and Plastics) for Plastic Products and SIC 36 (Electronics) for Telecommunication Equipment and Electronic Components. The two-digit industrial categories are defined much more broadly and, by implication, entail more heterogeneity of firms. Population size was measured by the number of production man-hours for 1967 and 1972 for the two pertinent industries, as reported by the 1967 and 1972 *Census of Manufacturers* (U.S. Bureau of the Census, 1971b, 1976).

The richness variables included wage rate, energy rate, unemployment, capital availability, venture capital sources, bank concentration, scientists and engineers, and academic influence. The wage rate was computed by dividing the total industrial payroll by the number of employees for the two-digit industries Rubber and Plastic (SIC 30) and Electronics (SIC 36). This information was obtained from the 1967 and 1972 *Census of Manufacturers* (U.S. Bureau of the Census, 1971b, 1976). The energy rate was the rate for electricity in 1967 and 1972, as reported by the Federal Power Commission (1969, 1974). Unemployment was measured by the percentage of unemployed persons in the SMSA in 1970, as reported by the 1970 Census (U.S. Bureau of the Census, 1972b).

Capital availability was determined with two standardized indices that were combined into a single index: the amount of savings capital in commercial banks during the period 1966–1974 (U.S. Federal Deposit Insurance Commission, 1967, 1969, 1971, 1973, 1975a) and the number of income tax returns exceeding $100,000 in 1972 (U.S. Internal Revenue Service, 1974). The FDIC information is recorded at the state level; when SMSAs cut across state boundaries, weighted averages were computed with the weights proportional to the population of the SMSA within each state.

It could be argued that capital availability would have a regional or national relevance, in that entrepreneurs who seek venture capital are not bound to their own urban area but may obtain capital from national or even international markets. It should be noted, however, that entrepreneurs seeking seed money generally do not have access to venture capital markets. According to an informal survey, conducted by the author, of venture capital bankers, very young firms seeking funds in the range of $50,000–$250,000 are constrained locally, and the entrepreneurs find funds through mortgaging their homes or by attracting funds from wealthy local individuals. Thus, they are inclined to stay close to home when they look for risky investment funds. The capital availability measure attempted to measure a proxy for the availability of seed money. It may be noted that one of the two components of this variable, the number of individuals with high income tax returns, ranged from 108 individuals in the least wealthy SMSA to 16,137 individuals in the most wealthy SMSA. Such information is assumed to indicate that SMSAs vary a great deal in providing potential start-up funds for new ventures. It should be recalled that this study involved new firms attempting to survive the legendary first year of their lives. Although venture capital firms tend to shun such firms, the number of venture capital firms was also included in the analysis, since this variable may reflect the entrepreneurial ''climate'' that prevails in the SMSA.

Venture capital sources was the number of venture capital firms in the main city or cities within the SMSA, as reported by Rubel (1972). Among the 25 largest venture capital firms, there is an amazingly strong tendency to finance ventures within the confines of their region. Venture capital does not tend to flow from one area to another. Many venture capital bankers tend to become personally involved in securing and cultivating their clients, which renders their domain more ''local'' and less ''efficient'' than other types of capital markets such as bonds or money markets (*Venture*, 1981). Hence, their prevalence signals entrepreneurial climate in the SMSA.

Bank concentration was the cumulative percentage of savings capital deposited in the four largest commercial banks in the SMSA (U.S. Federal Deposit Insurance Commission, 1975b).

The number of scientists and engineers was obtained from the U.S. National Science Foundation (1973b) and included the number of chemists, physicists, and engineers in the SMSA in 1970. Academic influence was measured by summing the number of graduate students in chemical engineering (for Plastic Products) and electrical engineering (for Telecommunication Equipment and Electronic Components) departments (U.S. National Science Foundation, 1973a). The number of graduate students was felt to approximate the potential influence of colleges and universities in diffusing scientific innovation. Those academic departments were felt to be more pertinent than the academic institutions as a whole.

The 70 SMSAs showed considerable variation on each of these independent variables. For example, the wages for electronics in 1972 ranged from $6.29 to $16.60. The percentage of unemployed varied from 2.2 percent to 8.2 percent in 1970 (U.S. Bureau of the Census, 1972b). The availability and cost of resources varied considerably among them. Such variations do

suggest that SMSAs can legitimately be construed as distinct socioeconomic entities.

RESULTS

The three high-technology industries showed a high level of entrepreneurial activity. For the period of 1967–1971, the total number of births was 1,232 in Plastic Products, 471 in Telecommunication Equipment, and 588 in Electronic Components. For the period 1972–1975, these frequencies were 1,453; 578; and 623, respectively. The higher frequencies in the second period should not be interpreted as a rise in entrepreneurial activity. For the two electronics industries, several of the smaller SMSAs had to be eliminated from the first period data when birth information was not sufficiently accurate. We may only conclude that there is some continuity in the distribution of birth frequencies among urban areas.

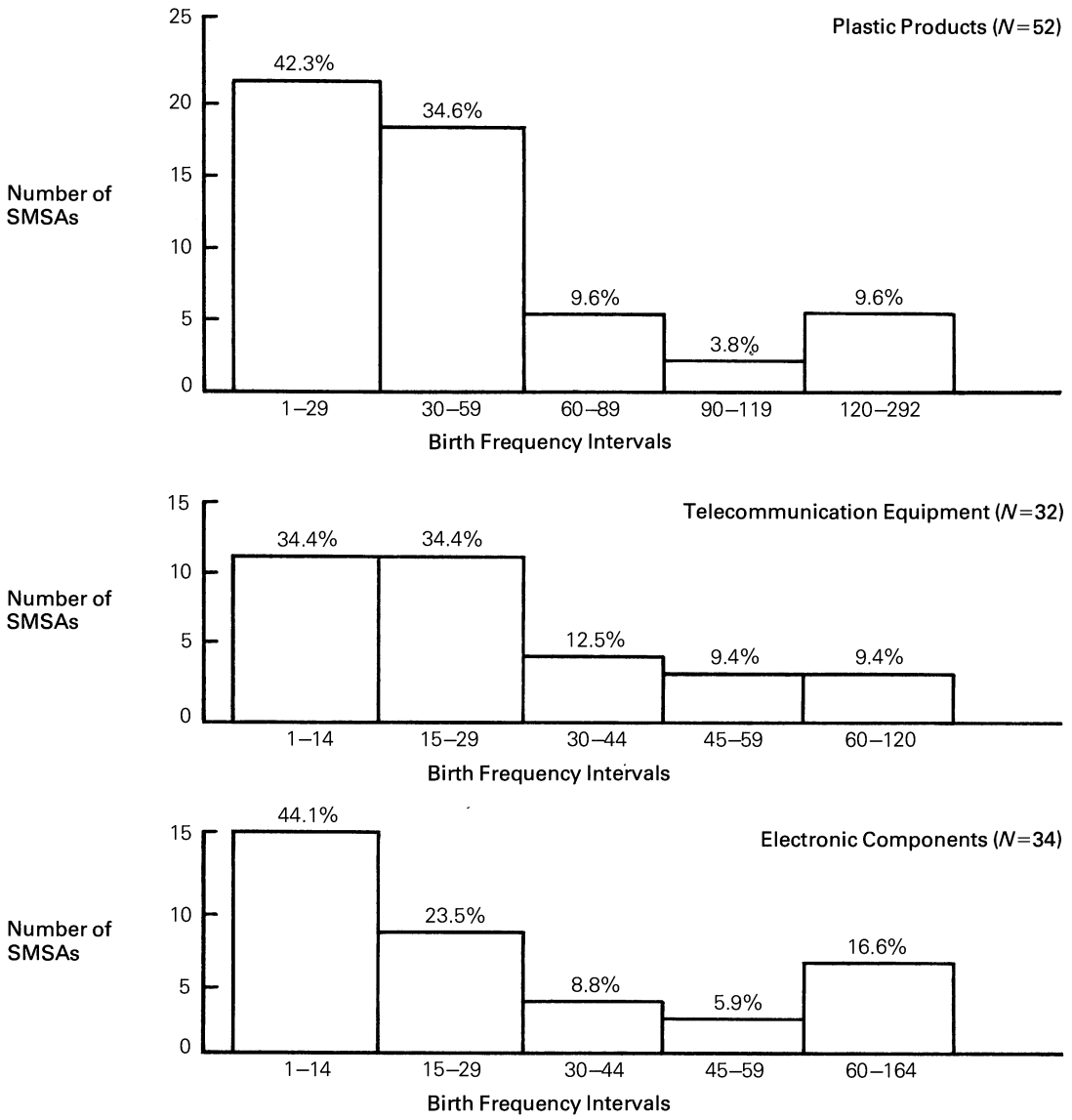


Figure 1. Histogram of organizational birth frequencies of 70 urban areas in three 4-digit industries (1967–1975).

Figure 1 shows the relative birth frequencies of the 70 SMSAs for the combined two five-year periods. The horizontal axis groups the birth frequencies into five broad categories; the vertical axis indicates the number of SMSAs. Thus, 21 SMSAs, representing 42 percent, witnessed between 1 and 29 births in the ten-year period. The actual number of observations was smaller than 70, as several SMSAs were dropped because the data were missing or were insufficiently accurate. As Figure 1 indicates, the distribution was heavily skewed to the left-hand side. More than 60 percent of the SMSAs in the two lowest categories, with relatively few urban areas having high birth frequencies.

The most prominent urban-metropolitan areas were Chicago, New York, Los Angeles, and Detroit for Plastic Products; New York, Los Angeles, and San José for Telecommunication Equipment; and Los Angeles, New York, and San José for Electronic Components. There was a great deal of stability in birth frequencies over the two periods. Those urban areas that had high birth activity in 1967–1971 also stood out for the second period. Indeed, the rankings were highly similar, especially for the electronics industries. The list of the top eight SMSAs for SIC 3662 and SIC 3679 differed by only one SMSA for each of the two periods. For the first period, the top eight SMSAs in SIC 3079 differed from SIC 3662 by three SMSAs and from SIC 3679 by two SMSAs. For the second period, SIC 3079 differed from SIC 3662 and SIC 3679 by four SMSAs. In the plastic products category, there was substantial similarity in rank order across the two time periods.

The Table provides the results of the hypothesis testing on the urban conduciveness of entrepreneurship. The Table shows three sets of columns, one for each industry. The first column of each set shows the unstandardized regression coefficients (*b*-coefficients) of metropolitan variables on birth frequencies, the second column lists the standardized regression coefficients (beta weights), and the third column shows the corresponding *t*-values.

It had been expected that urban centrality would affect birth frequencies positively, but the beta coefficients did not sustain this expectation. Central cities had comparatively lower birth frequencies, with the result being particularly significant for plastic products firms. This finding might be attributed to urban centrality being correlated with energy costs and other factors. Also, manufacturers of plastic products cater to customers in their immediate geographic area, so that the transportation benefits associated with urban centrality might not be pertinent. Compared with the other two types of firms, these organizations ship a relatively small portion of their output over a distance of 300 miles or more.

The positive impact of urban size was expected, but the size of the coefficients and their *t*-values were small. The effects were not significant at the .05-level. When the remaining variables were not statistically controlled, the effect of size was strong and highly significant. A test for the curvilinearity of this bivariate relationship, as stipulated by hypothesis 2, was negative. The correlation coefficients between birth frequencies and urban size were virtually identical to the correlation coefficients between birth frequencies and the natural logarithm of urban

Table

Multiple Regression Analysis of the Effects of Urban Characteristics on Organizational Birth Frequencies*

	Plastic Products (N=81)			Telecommunication Equipment (N=67)			Electronic Components (N=65)		
Independent Variables	b	β	t	b	β	t	b	β	t
Intercept	–2059.220			804.056			–3084.230		
Urban centrality	–8.807	–.229	–2.10	–4.057	–.269	–1.62	–2.62	–.128	–.74
Population (log)	7.839	.210	1.79	3.747	.224	1.47	–.059	–.002	–.02
Occupational differentiation	5568.883	2.912	1.31	2365.651	3.335	1.10	9277.113	9.752	3.12
(variable #3 squared)	–4230.580	–2.899	–1.30	–1849.750	–3.399	–1.12	–7207.260	–9.893	–3.16
Industrial differentiation	568.002	1.450	2.99	17.477	.109	.12	129.807	.601	.84
(variable #4 squared)	–647.518	–1.584	–3.20	–23.695	–.144	–.16	–139.266	–.618	–.85
Domestic immigrants	.095	.184	3.11	.047	.217	2.38	.140	.503	5.46
Foreign immigrants	.001	.026	.39	–.017	–.123	–1.18	.004	.020	.23
Volatility	.000	.006	.10	–.000	–.079	–.87	.000	.035	.44
Industry size	4.840	.746	7.79	.269	.237	2.31	1.687	.528	5.66
Size distribution	–15.790	–.055	–1.18	–1.372	–.004	–.63	–14.752	–.033	–.48
Wage rate	.289	.028	.63	–.898	–.039	–.51	–.271	–.008	–.13
Energy rate	8.341	.027	.61	.891	.007	.08	5.078	.029	.37
Unemployment	.509	.018	.32	.822	.077	.94	–.861	–.058	–.74
Capital availability	5.475	.367	1.97	2.247	.416	1.30	7.317	.985	4.04
Bank concentration	–.133	–.096	–.84	.177	.344	1.61	–.378	–.531	–3.16
Venture capital sources	.034	.026	.32	.027	.049	.59	.077	.101	1.27
Engineers	.004	.062	.91	.006	.202	1.50	.003	.089	.68
Academic influence	.000	.000	.01	.007	.111	.72	.015	.181	1.34
R^2		.91			.86			.89	

*Unstandardized, standardized coefficients and their t-values, respectively.

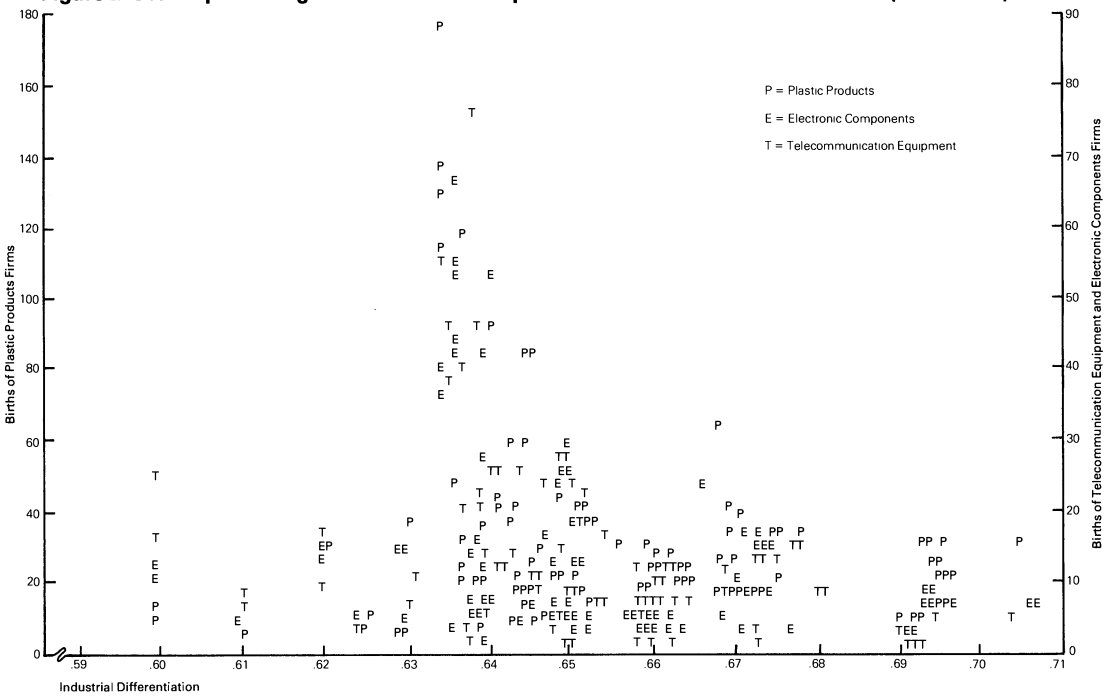
size. Size in itself explained approximately two-thirds of the variance. It is, however, more interesting to examine the effects of the correlates of size. The two differentiation indicators had the expected quadratic effect on birth rates. The effects were most pronounced for occupational differentiation. The relationship had been hypothesized to be positive up to a certain level, beyond which differentiation could have a negative effect. This relationship is depicted in Figure 2, which shows the scatterplot of occupational differentiation and birth frequencies in three industries, for the period 1967–1971.

The scatterplots for the three industries have been superimposed on each other. Instead of dots, P, T, and E are used to represent the scatterplots of the three industries. The birth frequencies for plastic products are mapped onto the left-hand side vertical axis, whereas the frequencies for telecommunication equipment and electronic components are mapped onto the right-hand side axis.

Figure 2 graphically complements the results of the Table by showing the inverted U-shaped association between differentiation and birth frequencies. The larger SMSAs such as New York and Los Angeles appeared not only to have higher birth frequencies, but they were also intermediately differentiated occupationally and industrially. When size was adjusted by dividing birth frequencies and differentiation by the square root of urban size, the pattern remained. Although the regression effects were not always significant, these results in their totality provide support for hypothesis 3.

Immigration, which augments urban differentation, was also expected to affect birth frequencies positively. As the Table

Figure 2. Scatterplot of organizational birth frequencies and industrial differentiation (1967–1971).



shows, the effect due to the proportion of domestic immigrants was strong and highly significant for each of the three industries (β = .184, .217, and .503, respectively). In contrast, the proportion of foreign immigrants did not have any major effect.

Volatility, as measured in this study, did not have any bearing on birth frequencies. A similar conclusion must be drawn if this measure is replaced by a nonlinearly derived measure of change. The amount of average change in economic value added over a twelve-year period (1959–1971) did not have any effect either. Clearly, hypothesis 4 is to be rejected.

Hypotheses 5 and 6 pertained to the size and size distribution of the industries that new firms enter. Industry size had a noticeable effect, whereas size distribution did not. The effect of industry size, which applied to all three categories of births, can be described in terms of "agglomeration economics" or in terms of the "pool of potential entrepreneurs," because many founders might be expected to originate from employers belonging to the same industry. We might also state that industry size indicates the combined set of "incubator-firms," which some authors (e.g., Shapero, 1975) treat as the pivotal factor in entrepreneurial activity.

It was predicted that the cost of labor and energy would have a negative effect on birth activity level, as higher wages and higher rates for electricity form disincentives for starting a new organization. The results in the Table do not corroborate this view. The electricity rate had a surprisingly minor influence. It had been anticipated that this effect would be particularly strong and negative for the birth frequency in the plastic products industry, because this industry uses more energy (kilowatt hours) per unit of value-addded manufacture than do the other two industries; in fact, firms in the first category consume more than the national average, whereas firms in the

latter categories consume less (United States Bureau of the Census, 1971c, 1: Table 5). It is possible, however, that the availability of additional energy, and not cost alone, is the issue in establishing a new business. There is some evidence that economic expansion is taking place in other than urban areas because of the lack of available energy (Wardell and Gilchrist, 1980).

Unemployment was not positively related to birth rates. Any positive effects may have been offset by the fact that unemployment may not only reflect the availability of labor but also the decline of economic activity and the preponderance of the hard-core unemployed. Thus, high unemployment levels may deter some entrepreneurs.

This study employed three indices of capital supply for potential entrepreneurs. The first two, capital availability and venture capital sources, were expected to have a positive effect, whereas bank concentration was assumed to be an indicator of risk-averse capital that might affect organizational birth frequencies negatively. This conjecture was correct for capital availability and bank concentration. Not only did they correlate strongly with birth frequencies, but they also had a pronounced effect when all other predictors were held statistically constant. Bank concentration was a negative proxy for venture capital, and its superior predictive power, compared with venture capital sources, may be attributed to the inclination of suppliers of capital, particularly risk-averse suppliers, to withhold support until a new establishment has successfully come through its first year.

Finally, engineers and academic influence had positive effects on birth rates, as expected, but the effects were weak, especially for the plastic products industry. The effects of both indicators can be seen as an indication that these factors contribute to the quality and the volume of the pool of potential entrepreneurs as well as enhance the diffusion of technological innovation at the urban level. If the scientists/engineers variable is eliminated from the equation, the effect of academic influence becomes very strong and significant for both the telecommunication equipment and electronic components industries; the regression coefficients for academic influence were .254 ($t = 2.33$) and .252 ($t = 2.48$) for the two industries, respectively. In contrast, its effect was negligible ($\beta = -.006$, $t = -.01$) on birth frequencies in the plastic products category. These two variables were fairly redundant with respect to each other; indeed, inclusion of the two variables rendered the regression estimation somewhat inefficient. The elimination of one of the two variables could, therefore, be justified and allows us to conclude that the proximity of relevant centers of higher learning is conducive to entrepreneurial vigor in high-technology fields.

A log-linear model, in which both the dependent and independent variables were transformed logarithmically, yielded results that were fairly similar to the results of the additive model described in the Table. The only difference was the higher and significant effects of the last two variables for the two categories of electronics industries. However, at this stage, it seems premature to employ multiplicative models to estimate the urban effects on organizational birth rates.

The results described here are also similar to results obtained with a generalized least squares procedure, which consisted of dividing the independent and dependent variables by the residual variance of ordinary least squares estimation. The effects were then reestimated to determine whether this adjustment for heteroskedasticity would improve the regression effects. Again, however, the results resembled those of the Table, except that the multiple correlation coefficients approached unity.

Finally, it should be mentioned that for the electronic industries, the variance of birth frequencies differed among the two time periods: the estimated variance of the 1972–1975 period exceeded that of the 1967–1971 period. The higher variance for the 1971–1975 period could be attributed to the steep de-escalation of U.S. involvement in the Vietnam war. The imminent conclusion of that war might have affected the military demand for electronic products. It certainly may have resulted in major sales contingencies for many of the firms in those industries. The Pentagon is their major client. Drastic and unforeseen changes in the demand for electronic products would make one expect more variance in the regression equations of contemporaneous birth frequencies. However, we did not detect a structural change in the regression coefficients when birth frequencies were separately estimated for the 1967–1971 and 1972–1975 data. The chow-test for structural shifts did not yield significant *F*-ratios.

Comparison across Industries

In an exploratory study, it remains difficult to make comparisons across three industries. The unit of analysis in this study was the urban community, and one should focus on its total configuration of ecological attributes, rather than treating the independent variables as a checklist of entrepreneurial location factors. Ideally, one should have information on all (national or international) industries, over several time periods and over a number of urban-metropolitan areas, to draw balanced conclusions about the relative importance of ecological, industrial and temporal variables on birth frequencies.

The three industries in this study were chosen because they show comparatively high levels of innovation and entrepreneurship. There is generally accepted agreement that technological opportunities in the chemical (plastic) and electronics industries are better than in the mechanically based industries (Nelson, Peck, and Kalachek, 1967). The exclusive focus on such science-based organizations, however, renders generalizations about the effects of the variables on birth rates in other industries problematic.

With this limitation in mind, one can review the results in the Table. The Table seems to suggest that urban factors are more crucial for birth frequencies in the plastic products industry than in the electronics industries, although the differences in explained variance were not very pronounced. Plastic products entrepreneurs might be more sensitive to the local ecological structure. Perhaps the strong regression effect of industrial differentiation indicates that, compared with their electronics counterparts, plastic products entrepreneurs find industrially heterogeneous urban areas more congenial. The idea of "ex-

ternal economies'' in accounting for entrepreneurial activity (James and Struyk, 1975) might explain this effect, because plastic products might have a more generic or diverse application when compared to the presumably more specific function of electronics products.

One might also speculate on the socioeconomic factors that affect birth frequencies. It seems reasonable to suppose that the three industries vary in ''cosmopolitanism.'' Specifically, the proportion of scientists and engineers employed in a particular industry can be construed as a proxy for a cosmopolitan, as distinct from a local, outlook. This proportion is much greater for the electronics industry (Scherer, 1970), so that one should impute a greater disposition among its key personnel to focus beyond the confines of their local domain. In addition, one might consider the differences among the three industries with respect to their dependence on the urban economy. The creation of some types of organizations might be associated with conditions reaching beyond urban boundaries. In the present study, an input such as energy or an output such as disposal costs might vary from industry to industry.

There were, indeed, differences in energy or transportation expenditures in the three industries studied (U.S. Bureau of the Census, 1971b, 1971c, 1976). Established firms in the plastic products industry consume more energy and ship a smaller percentage of total output beyond 300 miles, as the following numbers show:

Industry	Ratio of energy expenditure to value added	Percentage of output shipped beyond 300 miles
Plastic Products	.022	53
Telecommunication Equipment	.009	68
Electronic Components	.016	60

It should be emphasized, however, that Census figures do not take into account the output of newer organizations. Thus, we do not know scale economies, or the percentage of their products shipped locally. Indeed, the energy expenditures and transportation percentages in the last two columns are very likely biased estimates of the actual levels for the new firms in the three industries. New firms are less likely to have developed a geographically extensive distribution network. The above numbers reflect all firms — both young and old or large and small. Nevertheless, these data illustrate that local energy rates are of relatively smaller consequence in the two electronics industries than in the plastic products industry. Also, transportation is a more important consideration for the electronic industries than for the plastics industries. Plastic products entrepreneurs might be more sensitive to local economic conditions because transportation is not so strategically important. However, data on a greater number of industries are needed to determine which independent variables are most pertinent to an explanation of birth frequencies and to determine whether their explanatory power varies with the type of industry examined.

CONCLUSIONS

This study has set out to test seven hypotheses about the entrepreneurial correlates of urban characteristics. The study should be considered exploratory, because only three narrowly defined industries were examined with respect to their birth activity. Nevertheless, the support for several of the hypotheses sheds some light on organizational birth frequencies. The most important predictors included occupational and industrial differentiation, the proportion of immigrants, the size of the industry, the availability of venture capital, and, to a lesser extent, the presence of universities. Although the support for some other variables was somewhat equivocal, the results of the study justify future research. For example, the entrepreneurial significance of universities is clearly supported for certain types of industries by anecdotal evidence, but more research is needed to determine the importance of this finding. Do entrepreneurs in some industries originate from universities rather than from industrial organizations? Despite the cosmopolitan nature of science-based industries, one might also ask whether the diffusion of technological innovation is enhanced by the density and quality of communication networks having a territorial, local base. Such questions cannot be answered with aggregative data but should be inferred from the results of this study.

Since the industries in this study are comparatively small, we can discard any possible feedback among them in their respective growth or decline. Upward or downward change in the size of any one of the industries studied probably has little or no effect on the other two. This may not be the case, however, if new research examines birth frequencies in many industries; in such research, the dynamic interplay among the populations of organizations will be salient (Hannan and Freeman, 1977). The inclusion of many more industries will also enhance our understanding of the joint effects of territorial and industrial-economic characteristics. Thus, ecological research will be complemented by industrial-economic research. Identification of industry differences in birth rates as a function of urban factors will also have practical implications and can help policymakers in promoting the creation of new organizations.

It is also important to stress the need for longitudinal research. Ecological events are inherently dynamic. Some of the results of this study might have been spurious because the study did not consider autoregressive effects. Furthermore, certain exogenous effects might operate in accounting for the joint occurrence of independent and dependent variables. For example, both the influx of immigrants and the rise of new organizations might be attributed to a third factor such as long-term economic expansion or the emergence of the Sun Belt. Such inquiries can be dealt with only by longitudinal research.

In this paper, a population ecology framework was followed. It should be stressed, however, that the population ecology framework exists side by side with the resource-dependence framework (cf. Thompson, 1967; Child, 1972; Pfeffer and Salancik, 1978). In this latter framework, organizations can be viewed as continuously adapting to environmental constraints, actively entering into transactions with external agents while seeking optimum control over external sources. Such organiza-

tions will maneuver themselves in their environment so as to acquire optimum external control and will shift their disposition whenever environmental conditions dictate. Entrepreneurship in this framework is conceptualized in proactive, resource-optimizing terms. The entrepreneur is a volitional individual who enters an environment and makes the strategic choices that ensure the best transactions with the environment.

This framework contrasts rather sharply with the population ecology framework's quasi-Darwinistic, deterministic emphasis in which the environment is a set of influences that selectively permit some ventures to survive. Implicit in this framework is the entrepreneur who is a somewhat passive, reactive individual whose organization gets selected out by environmental tests of fitness. Within this line of thinking, we can empirically delineate the environment as a set of factors that lead to the creation of new firms. In this paper, we have seen that conceptualizing the environment in terms of urban-metropolitan areas can be a useful avenue for predicting the rise of new firms.

Using the resource-dependence framework, the environment and entrepreneurship would be subjected to a different treatment. Specifically, independent variables of this study might be viewed as an array of relevant resources from which the potential entrepreneur could draw. Entrepreneurs could conceivably scan a number of environments (i.e., urban communities) and select those that would ensure the most advantageous supply of resources. Indeed, the study might then become an investigation of the entrepreneur's organizational location decision. The study would address the factors determining the location of organizations, given a creation decision. Such a framework, however, would not provide an integral treatment of the environment in which all its attributes form a gestalt to make up the ecological structure.

By adopting an ecological framework, we have sought to treat the urban environment as stimulating or impeding the entrepreneur's creation decision. In a strict sense, this study does not permit an unequivocal statement about whether the data were actually relevant to the creation decision or whether they concerned the location decision of entrepreneurs. To resolve this issue, however, we ought to have background information on the entrepreneurs behind all those new organizations. The advantage of an ecological approach to entrepreneurship is that it offers an opportunity to focus on the environmental antecedents of business start-ups without our having to obtain information about the motivations of the firms' founders. It implies that variations in entrepreneurial activity can be accounted for by simply assessing and evaluating the socioeconomic make-up of the urban community.

Nevertheless, future research should combine the motivational and ecological antecedents of entrepreneurship, for example, by integrating and cross-fertilizing ecological and resource-dependence frameworks of the founding of organizations. We may then be able to determine to what extent the factors that explain the creation decision have to be supplemented by or substituted for the factors that account for the location decision. This line of research might then also contribute to the synthesis of these contemporary schools in organizational theory as a whole (Meyer, 1978; Pennings, 1982).

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