Examining the Seedbed Potential Characteristics of Certain Manufacturing Industries: A Case Study of the Houseboat Manufacturing Firms in the Lake Cumberland Region of Kentucky

Steven Brent Lackey

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About the Authors

Steven Brent Lackey is a graduate student at the University of Kentucky. He will graduate in December 1998 with a M.S. in Agricultural Economics

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Executive Summary

The promotion of indigenous entrepreneurship is generally thought to be a superior development strategy to industrial recruitment. However, there is little knowledge on how to actually increase the number of entrepreneurs in a region, which is one reason why most development officials pursue an industrial recruitment policy instead. Most development officials and scholars agree that past employment experience serves as an important road to entrepreneurship, and many think that certain types of employment experience are more conducive to the promotion of entrepreneurship. These beliefs serve as the foundation for the notion of seedbed industries.

Seedbed industries promote indigenous entrepreneurship, and they have the ability to stimulate a spinning-off process. Employees break off to start a new firm within the same industry or in a related sector during a seedbed process. Perceived market opportunities stimulate them to start a new business, and these opportunities can range from unexplored market niches to the supplying of inputs cheaper or more efficiently. A seedbed process can often result in the agglomeration of firms within an industry in the local economy.

For an industry to have seedbed potential, the firm and the community must contain certain characteristics. The firm needs to be structured so employees are able to acquire multiple skills and to gain knowledge of the business operations, and the community must be considered an "entrepreneurial friendly" environment. To determine what characteristics of the firm and community provide seedbed potential, a comprehensive literature review is performed. Because the notion of seedbeds encompasses many topics, the literature review examines relevant papers and studies of the subjects firm formation, entrepreneurship, flexible specialization as an organization of production, and the economics of agglomeration.

An example of a seedbed process and a list of critical characteristics are the results of the comprehensive literature review. Haug's (1991) study of the software industry in Washington state reveals that most of the new software firms in the state are spin-offs. A majority of the owners of the new establishments had previous work experience in the software industry. Microsoft played a major role in the agglomeration of software firms in this region since it has spawned many individual software companies by former employees breaking off (Haug, 869-94). The characteristics of the firm and community that provide seedbed potential are also identified. It is not necessary for the firm and area to have all of the characteristics, but they must contain enough of them to allow the employees to acquire multiple skills and knowledge of the business and to be exposed to an "entrepreneurial friendly" environment. These factors are summarized in the following list:

Firm and Community Dominated by Small Firms: Small firms are more likely to promote entrepreneurship because employees have a chance to work closely with the owners and to learn how the business operates. Employees have a better probability to perceive market opportunities.

Relatively Skilled Labor Force: Skilled labor is more likely to have a better understanding

of how the business operates and to have the "know-how" to start a new business.

Relatively Large Proportion of Management and Professional Occupations: Employees in management are more exposed to the market and more likely to perceive opportunities. Managers also generally have a comprehensive knowledge of the production process.

Flexible Specialization as an Organization of Production: Flexible specialization promotes the cumulative acquisition of skill, which is believed to be vital in entrepreneurial development.

Low Barriers to Entry: Extensive capital requirements and high initial operating costs are huge obstacles for potential entrepreneurs to overcome, and often prevent them from attempting to start a new enterprise.

Pool of Trained Labor: For a seedbed effect to occur there must be sufficient labor to staff the new firms.

Existence of Business Networks or Associations: Networks and associations can be very helpful in providing the entrepreneur with information on the market and the productive process, and they are very useful in creating an "entrepreneurial friendly" environment.

Supportive Environment: It is vital that people in the community not look down on business failures. If business failures are seen in a negative context, then potential entrepreneurs will be reluctant to start a new business.

Entrepreneurial Culture: The presence of entrepreneurs in the community provides role models to potential entrepreneurs, and without role models and exposure to new business start-ups, it is unlikely that a person will engage in entrepreneurial activity.

Accessibility to Markets, Suppliers, and Transportation: The potential entrepreneur must have relatively easy access to the market. Barriers like distributors or dealers will make it difficult for new firms to get started. Easy access to suppliers and transportation are very important for minimizing costs.

Significant Proportion of Purchased Inputs are Intermediate Goods: If a company purchases a significant amount of intermediate goods, an employee might perceive an opportunity to establish a firm that could supply the original firm with an input at a lower cost.

Market Growth Potential: A spinning-off process cannot sustain itself if there is no room for growth and if an increase in the number of firms only leads to a saturation of the market.

A case study of the houseboat manufacturing industry in the Lake Cumberland region is performed to see if it has experienced a seedbed effect and to gain empirical insight of seedbed industries. This is a plausible example of a seedbed because of the agglomeration of houseboat manufacturing firms in the region and because it is considered a craft industry. The study reveals that the industry and the area contain many of the essential characteristics, such as skilled labor force, relative small size, flexible specialization, and an entrepreneurial culture. However, it concludes that the houseboat industry in this area has not experienced a seedbed effect for a couple of reasons. First, it is missing a few of the key ingredients. Most of the production is done

completely in-house, and the firms only purchase few supplies or intermediate goods locally. Plus, the necessity of having many contacts in the business to attain contracts in the infant stage of the firm and the high initial operating costs serve as huge barriers to entry for potential entrepreneurs. Secondly, former partners who divorced on very bad terms established a majority of the new firms. Due to the missing factors and the circumstances that led to the founding of many of the houseboat manufacturing firms, it is concluded that the houseboat industry in this region did not experience a seedbed process.

The case study was able to shed more insight on the notion of seedbed industries. The study reveals that a manager and worker probably need to break off together for employees to be successful in starting a new manufacturing firm. In starting a new establishment it is important for the entrepreneur(s) to understand the business operations and the production process, which is why both are needed. This also suggests that workers and managers need to work closely for the firm to have seedbed potential so a manager and a worker feel comfortable working together and have a chance to talk about starting a new firm. This study also implies that personal funding could serve as a barrier to employees establishing a new firm. Most of the funding used by houseboat owners came from personal accounts, and banks will only lend a certain percentage of the required funds to establish a new firm. Since most manufacturing employees do not earn a significant income, it is highly possible that personal funding could be a major barrier to them. Finally, the unfriendly relations among the owners of the houseboat manufacturing firms demonstrates the importance of competition and conflict as a driving point of new firm formation.

The notion of seedbed industries has many important policy implications for development officials. By following a strategy that captures possible seedbed effects, development officials are able to combine the strategies of industrial recruitment and indigenous entrepreneurial development. Regions with the conditions that are conducive to entrepreneurial activity can target and recruit industries with characteristics that provide seedbed potential. Economies that have industries with seedbed factors but have not experienced seedbed processes can concentrate on developing the conditions within the community that promote entrepreneurship. For example, the Lake Cumberland region may want to develop a job-training program that promotes a more collaborative environment among the business owners, which is found to be one of the missing ingredients in the case study.

Implementing a seedbed strategy has advantages that are inherent in both industrial recruitment and indigenous entrepreneurial development. Like a recruitment policy, a seedbed policy can have significant impacts on the employment level in the local economy, and because of the inherent characteristics of seedbed industries it can increase the number of "good jobs" in the economy. Seedbed industries are not very likely to be "footloose" for a couple of reasons. A seedbed effect generally results in an agglomeration of firms within an industry, and due to the advantages that agglomerations offer it is unlikely that a firm or an industry will uproot and leave. Also, a seedbed strategy promotes local ownership of businesses, which provides many benefits to the local economy.

Introduction

An important issue in rural economic development is providing adequate employment opportunities that supply not just jobs to the local economy, but jobs that are considered "good" jobs. Industrial recruitment and indigenous entrepreneurship are considered the primary paths for achieving these goals. Which path to follow is generally considered an "either/or" question, and most states implement a strategy of industrial recruitment. However, an enhanced level of entrepreneurship is widely considered a better strategy for the following reasons: 1) its emphasis on locally owned businesses, 2) greater probability that the business will not uproot and leave, 3) smaller capital needs, 4) better chance of local economic diversity, and 5) potential for backward and forward linkages. But there is limited knowledge on how to actually increase the number of entrepreneurs in a region, and most literature on entrepreneurship indicates that not all regions are suitable for an entrepreneurial development policy.

Many believe that one of the most common pathways to entrepreneurship is past employment experience, and it is felt that some types of employment experience are conducive to promoting entrepreneurial development. It is these beliefs that serve as the foundation for the notion that certain industries have seedbed potential, which means that they promote indigenous entrepreneurship and can create a spinning-off process. Within this spinning-off process employees break off to start a new firm in the same industry or in a related sector. In this process employees break off to pursue perceived market opportunities. These opportunities can range from unexplored market areas to the provision of inputs cheaper and more efficiently. A seedbed effect, the spinning-off process, can often result in an agglomeration of firms within an industry in the community or region, which can bring the local economy many of the benefits of specialization. If some manufacturing industries are, in fact, seedbeds then it would be possible for local development officials to implement employment strategies that combine industrial recruitment and indigenous entrepreneurial development.

Although the possibility of some manufacturing industries having seedbed potential has many implications for rural development, it must be noted that seedbed potential does not exist for all industries and for every local community. In this paper the characteristics of a potential seedbed are determined. These seedbed conditions are identified through a comprehensive literature review. Then a case study of the houseboat industry in the Lake Cumberland region is performed to illustrate a possible example of a seedbed effect. The purpose of the case study is to investigate the inherent seedbed characteristics in the houseboat industry and whether or not a seedbed effect has taken place. In the conclusion, a summary of the findings is given, and policy implications of seedbeds are discussed.

Development of the Necessary Factors for Seedbed Potential

For a seedbed effect to happen, or even have potential to occur, a number of factors must be present in the manufacturing firm and in the community. The firm and the community must have characteristics that allow the acquisition of multiple skills and knowledge of how the business operates and that provide an "entrepreneurial friendly" environment. Many characteristics of the firm that are thought to be the most important are a small number of employees, a relatively high-skilled labor force, and an organization of production that allows for cumulative acquisition of skill. Characteristics of the community are widely believed to be very important for the entrepreneurial development process to take place, and these favorable conditions include the presence of entrepreneurs in the community and favorable government policies. This section of the paper examines literature on the topics of

firm formation, entrepreneurship, economics of agglomeration, and the flexible specialization organization of production. The purpose of the literature review is to identify the critical conditions of firms and communities that are believed to be inherent in seedbeds. The literature review encompasses multiple topics because of the nature of a seedbed process and the fact that it is a relatively new topic.

Firm Formation

What factors significantly impact new firm formation rates is an important question to answer in determining the important characteristics of a potential seedbed. There have been numerous papers on what factors lead to greater firm formation rates, and this section discusses the findings and theories of these studies. Markley and McNamara (1995) discuss how many rural communities can sustain economic opportunity. They talk about how owners of new business start-ups face the problems of limited management experience and capital, high initial operating costs, and lack of familiarity with sources of assistance. They believe that the extent of indigenous business growth depends upon the linkages between firms assisted by business development programs and those in other sectors of the region. Markley thinks that incubators provide firms easy access to business counseling and encourage networking among firms (Markley, 1259-64).

M. Hart and G. Gudgin (1994) attempt to explain the spatial variation of new firm formation in the Republic of Ireland. According to them the vast majority of new manufacturing firms employ fewer than eleven persons, but the most important source of new jobs is firms with eleven to forty nine employees. However, the results of their multivariate analysis of the determinants of new firm formation at the regional level show that small firms have a positive but non-significant influence on new firm formation. Hart and Gudgin's study finds that the most important positive influence on new firm formation is the proportion of professional and managerial occupations in the county and the growth of manufacturing employment. The negative influences, according to their study, are small county population, the proportion of the county population gaining access to higher education, and measures of net migration. This study implies that relatively few people with higher education qualifications proceed to start new manufacturing firms (Hart, 367-80).

P. Haug (1991) studies the agglomeration of the software industry in Washington state, and reveals that most company formations have been generated by local entrepreneurs. Haug's findings are based on a survey of 152 software firms in Washington. He finds that the overwhelming reason for choosing Washington as the location of the firm is that the founder or CEO lived in Washington and wanted to stay there. The other location determinant is proximity to major customers, as well as closeness to other high-technology firms and availability of qualified labor. The study shows that a majority of the software company founders worked in the industry before establishing the firm and that spin-offs contributed to the development of the high-tech agglomerations. Microsoft played a major role in this agglomeration since it spawned many individual software companies with many former employees breaking off to start their own business. Haug finds that the major reason, for individuals starting their own business, centers on finding an opportunity or need for the goods or services they plan to offer in the market. Also, he finds that the resources necessary for starting software firms are not very substantial, which gives more individuals a chance to become entrepreneurs. The overall finding of the Haug paper is that most new software firms were established by individuals leaving existing software firms to exploit unfilled product demands (Haug, 869-84).

Tim Wojan (1997) discusses the agglomeration of the software development firms in Fairfield, Iowa. According to Wojan, it was exposure to the way in which business is conducted and valid channels of business engagement that enabled the start-ups by the

in-migration of entrepreneurs to position themselves to secure contracts. He finds that the critical input in the early stages of agglomeration is a diverse set of highly educated individuals. Wojan also shows that the creation of a new firm results from the hesitation of an owner to recognize the potential of a new market niche, which opens the door for employees to break off and exploit this market area. He discusses the importance of the perception of business failure in the community, and he believes that the agglomeration process is very sustainable in Fairfield because people are willing to try second and third businesses after failing initially (Wojan, 6-8).

Gioacchino Garofoli (1994) studies the regional differentiation in new firm formation in Italy. Garofoli shows that there was a significant decline in the new firm formation rate between 1986-1990, and he gives the following reasons: increasing technological sophistication, higher capital requirements, and increasing complexity of firm management. He believes that local environment factors, such as productive specialization (percentage of employees in manufacturing sector compared to total employment in manufacturing industry), interdependence of firms and sectors, and presence of self-employment, have an impact on new firm formation. Garofoli thinks that small firms provide an excellent training ground for potential entrepreneurs. The results of his regression analysis demonstrate a positive relationship between rates of firm formation and the degree of productive specialization and the proportion of self-employed workers. Also, he finds a positive relationship between firm formation and areas dominated by small firms. The results also show a negative relationship between new firm formation and the proportion of manual workers and changes in unemployment. The regression analysis demonstrates that local demand and new firm formation are unrelated (Garofoli, 381-93).

P. Davidsson, L. Lindmark, and C. Olofsson (1994) report the findings from a study of the role of small, new firms in the Swedish economy. According to Davidsson, over ninety percent of new establishments are single establishment firms with autonomous ownership. They report two patterns of firm formation across the regions of Sweden. The first one is that the regions with the largest populations have the highest rates of firm formation. The second is that regions with the lowest birth rates are those dominated by one or a few large manufacturing firms. They hypothesize that four factors determine the formation rate, and these factors are availability of motivated and capable individuals, regional market conditions, access to capital, and supportive environment such as living conditions and entrepreneurial culture. Within the category of availability of motivated and capable individuals they include socio-demographic factors, role models, and relevant experience. Their regression analysis shows that the unemployment rate is the only socio-demographic factor that influences formation rates which happen to be positive. Work experience in small firms and availability of role models stand out as the most important determinant of regional variation. The study finds that the percentage employed in technical professions has a positive effect on manufacturer births, and it shows that within the manufacturing sector small scale tradition is the most important determinant of manufacturing birth rate variations across the regions. It discovers that business support expenditures have a positive effect on manufacturing birth rate and that population size and density do not significantly affect manufacturing birth rates (Davidsson, 395-410).

D. Anderson and S. Johnston (1992) discuss the importance of linkages in industrial location. They stress how important it is for area planners to understand the existing structure of the economic base and the germane interindustry relationships. A very important factor of industry location is access to markets and suppliers. Anderson says that one reason for this is that proximity to distribution centers reduces the costs faced by firms, and according to Anderson and Johnston transportation costs are the most common example of a visible

agglomeration factor, especially with the development of Just-in-Time delivery. They also maintain that proximity facilitates collaborative relationships between firms (Anderson, 321-323).

D. Audretsch and M. Fritsch (1994) look at the linkages between increasing returns to production within a spatial unit and the number of new firms. They discuss how a region can obtain increasing returns that arise from spillovers from pooled labor markets, pecuniary externalities, and information or technology spillovers. Technology spillovers are the most beneficial to small firms, and new businesses are more likely to locate in areas where they exist. Regression analysis over 75 regions in Germany shows that the change in unemployment rate has a positive influence on firm formation. Analysis also discovers that new firms have a higher propensity to locate in regions with higher skilled labor. The study also finds that the propensity to start a business is greater for persons with work experience in small firms (Audretsch, 359-364).

A. Nucci and L. Long (1996) believe that rural locations have new competitive advantages in the 1990s vis-à-vis older metro areas. These advantages are lower taxes, low wages, low utility costs, less unionized workforce, and a pro-business attitude (Nucci, 3).

T. Wojan, D. Freshwater, and A. Maung (1996) test the effects of skilled employment and number of small firms in a region on the firm formation rates. The authors propose two hypotheses that are tested in the paper. The first one is that the presence of an industry characterized by higher proportion of small establishments in a given manufacturing sector has a positive effect on the rate of firm formation within that sector. Wojan tests this hypothesis with three different sectors (Furniture and Fixtures, Fabricated Metal Products, and Industrial Machinery). The analysis finds some significant evidence that industries dominated by small establishments have a positive effect on the rate of firm formation, but the results were not very significant. The second hypothesis tested is that the presence of more highly skilled industries in a manufacturing sector has a positive influence on rate of firm births, and this was tested with a regression analysis using the Lumber and Wood Products sector in the Appalachian region. After the model was refined to take out backward linkages, they find significant evidence supporting the notion that higher proportion of skilled workers has positive impact on new firm births (Wojan, 3-10).

Entrepreneurship

The notion of the seedbed is built around the premise that certain types of employment experience are more conducive to promoting entrepreneurship. Therefore, the factors involved in entrepreneurial development are very critical in providing seedbed potential. This section reviews the literature on entrepreneurship to determine the characteristics of a community and a firm that promote entrepreneurial development. R. Shaffer (1989) discusses the particular skills required for entrepreneurship and the elements involved in company formations. He identifies four skills needed for entrepreneurship. The first skill is an accurate perception of market opportunities and devising effective strategies for exploiting them. The second is the capacity to identify and meet resource needs, and the third is the ability to manage political relationships. The fourth skill is the ability to manage interpersonal relationships. He also discusses the elements involved in new firm formations, which are displacement, disposition to act—which implies a self-reliant attitude, credibility to act, and the availability of resources (Shaffer, 39-42).

S. Rasheed and D. Luke (1995) discuss the general constraints of entrepreneurship in Africa. The primary barriers identified by Rasheed are political instability, the lack of business confidence, deteriorating infrastructure, uncoordinated policies on business, and insufficient knowledge in the government. Many rural areas in the United States face these same constraints. They outline several conditions for entrepreneurial development, specifically for Africa, that are also applicable to

rural America. The first is competent economic management, efficient civil service, and a sound infrastructure. The second condition is credible lending institutions, and reliable information on microeconomic behavior is also necessary. The final one is the development of market networks. These networks can overcome limitations of market size and other constraints through links with other businesses, and they can be effective for the transfer of "know-how" and assistance (Rasheed, 149-172).

A. Shapero and L. Sokol (1982) draw upon the social dimensions of entrepreneurship to develop a paradigm of entrepreneurial event formation. According to Shapero, no psychological framework suggests that there is a particular need or drive for company formation, even though it can be linked to generalized needs for achievement. They say that it generally takes a powerful force in a new direction or the accumulation of many detracting forces before an individual is pushed to opt for a major change in his/her life. A person is more likely to take action upon negative forces such as job displacement or dissatisfaction. Shapero thinks that the feasibility of a project often influences the person's notion of desirability. Shapero and Sokol also assert that a social system that places a high value on innovation, risk-taking, and independence is more likely to produce entrepreneurial events. Shapero also believes that the larger the number and variety of entrepreneurs in a particular community, the greater the chance an individual in that area will start his/her own company. Shapero and Sokol also think that small firms provide a closer view of the owner for the employee, and in essence provide a role model for him/her. According to Shapero, studies show that a majority of all new establishments use capital from personal savings and borrowings (Shapero, 77-87).

A. Bruno and T. Tyebjee (1982) discuss the environmental factors conducive for entrepreneurship. They develop a list of eleven essential factors for promoting entrepreneurial development by combining the results of several studies. The following lists the necessary environmental factors for entrepreneurship: 1) venture capital availability, 2) presence of experienced entrepreneurs-successful companies attract new entrepreneurs, and persons are more likely to leave secured positions if risks associated with new enterprise are controlled and easily assessed, 3) technically skilled labor force, 4) accessibility of suppliers and to customers, 5) favorable government policies, 6) proximity to universities, 7) availability of land or facilities-many recommend shell-type buildings and availability of water, power, sewage, roads, or zoning to help potential entrepreneurs get started, 8) accessibility to transportation, 9) receptive population-societal attitudes towards entrepreneurship and start-ups and failures have powerful influence over individual decisions to start a new enterprise, 10) supporting services like lawyers and accountants, and 11) attractive living conditions (Shapero, 277-287).

B. Kirchhoff (1994) in talking about the relevance of dynamic capitalism in the current economy discusses the possible barriers to entrepreneurs and the importance of resource mobility to entrepreneurship. He explains how many barriers are created by existing firms to create competitive advantages and prevent new firms from entering the market and stealing their market share. Many firms require distributors to sign agreements that prohibit the distribution of the competitor's products, and this prevents an entrepreneur from starting an enterprise for s/he has no way to get in the market. Another barrier is created when industrial policy promotes the meetings of managers of competing firms. Due to these meetings, collusion occurs and barriers are built. Kirchhoff also talks about the role of labor mobility in helping or hindering entrepreneurship. He says that workers must be able and willing to move from job to job in order to facilitate the formation and growth of new firms. Financial security remains a high priority for many who perceive mobility as a threat to employment security. Capital mobility also plays a part in constraining many new firms. Many small firms do not have access to

the public markets for capital that serve many large companies, and Kirchhoff says that many regulations prohibit the establishment of information systems that could facilitate small firms' search for capital (Kirchhoff, 197-205).

Wojan, Freshwater, and Maung (1996) discuss many of the factors that promote entrepreneurial development. They think that the probability of someone becoming an entrepreneur is higher when employment is characterized by the cumulative acquisition of skill. According to Wojan, the most evident barrier to cumulative skill formation is job tenure and when employees perceive no opportunity for advancement then they have no incentive to maintain long term working relationships. Wojan gives the following factors that could affect the promotion of indigenous entrepreneurship: commitment to worker involvement, incidence and use of temporary workers, migration rates of local population, and opportunity for internal development of skills within the firm (Wojan, 1-20).

Flexible Specialization and Economics of Agglomeration

Employment experiences that allow for the acquisition of multiple skills are believed to be more conducive to entrepreneurial development, and this belief serves as a foundation for the notion of a seedbed. Since flexible specialization as a type of organization of production allows for multiple acquisition of skills, it is thought to be a critical condition of potential seedbeds, and this is why a review of the relevant literature on flexible specialization is performed in this section. Seedbed effects also result in the agglomeration of a certain types of firms in an area, and because of this the literature on the economics of agglomeration is reviewed to identify what factors are the most prevalent in the agglomeration of manufacturing firms.

A. Scott and M. Storper (1986) discuss the geography of high technology industries in the United States. They believe that the dynamics of the spinning-off process are captured in terms of the industrial organizational process and the social division of labor. Scott describes three circumstances that lead to vertical disintegration, which include: 1) where labor processes resist integration into unified machine system, 2) when output markets are unstable, producers may disintegrate to avoid uncertainty, and 3) where inputs may be produced more efficiently by outside firms. The evolution of vertical disintegration has resulted in an elaborate structure of inter-plant transactional relationships which promote face-to-face contacts and the exchange of strategic information. This results in a geographic-dependent cost structure. Scott concludes by saying that the geographic tendencies of high-tech firms are represented by agglomeration based on flexible forms of production (Scott, 3-15).

D. Barkley and M. Henry (1997) define an industrial cluster as a loose, geographic bounded collection of similar and/or related firms that together create competitive advantages for member firms and the host economy. They divide clusters into three types which are Marshallian, Hub and Spoke, and Satellite. Barkley describes Marshallian clusters as composed of locally owned small and medium-sized businesses which are concentrated in craft-based, design intensive industries. According to them Marshallians are disproportionately located in metropolitan areas because smaller firms place significant importance on proximity to skilled labor. Barkley claims that the advantages of clusters are that they stimulate networking and provide potential cost saving. Rural areas are unpromising seedbeds for Marshallian clusters because of their legacies of large corporate firms, low education levels, and reliance on government subsidies. Barkley feels that a supportive environment that discourages antagonistic competition and engenders trust, cooperation, and coordination is necessary for clusters (Barkley, 308-25).

R. Kaplinsky (1994) talks about the shift from mass production to flexible specialization

as a new paradigm of production. The central feature of flexible specialization is that the layout is altered from a functional configuration to a cellular pattern in which different families of products are manufactured in small mini-factories. With this paradigm work is organized in groups rather than individual detail, and another difference with the cellular layout is that employees are required to perform three or four tasks instead of a single, repetitive task. It has been observed that workers enjoy this system because they actually feel noticed and important to the overall production process (Kaplinsky, 337-353).

P. McCann (1995) addresses observed problems in agglomeration economies. He describes two paradoxical phenomena in the spatial clustering of firms. In many clusters, a large proportion of firms have few or no trading links with local firms in the same industry. The second paradoxical situation is that a large proportion of firms have few or no trading links to firms or consumers in the same geographic area. He identifies four types of locational costs faced by firms, and according to him, agglomeration will only always occur if they face two of these costs. He calls the two agglomeration costs heirachy-coordination costs and hierarchy-coincidence opportunity costs, and both of these are always dependent on the existing number of other firms/households at the location. McCann says that heirachy-coordination costs occur when the nature of the good produced is continuously changing. In these situations the costs of not being in face-to-face contact outweigh the benefits of lower factor costs, and the firm will locate next to firms performing similar activities. With hierarchy-coincidence opportunity costs firms attempt to minimize the opportunity costs of a lack of hierarchy-coincidental costs. Firms choose the location where the maximum number of final links in potential consumption hierarchies are likely to be coincidental (McCann, 563-577).

Characteristics of a Seedbed

For a manufacturing industry to have seedbed potential the local community and the firm must contain a certain number of important factors. The firm must be structured so that the employees can acquire multiple skills and be exposed to the operation of the business. The local area also must have many characteristics that are believed to be conducive to entrepreneurship. Based on the literature review, the topics of firm formation, entrepreneurship, economics of agglomeration, and the flexible specialization organization of production, the characteristics of a seedbed are identified in this section. A rural manufacturing firm and its local environment do not have to contain all of these identified characteristics to have seedbed potential and for a seedbed effect to occur, as long as employees are given a chance to acquire multiple skills and knowledge of business operations and an "entrepreneurial friendly" environment. The following list gives and describes the hypothesized conditions that provide seedbed potential.

Firm and Community Dominated by Small Firms

Studies have shown that small firms have a positive impact on the rate of firm formation in the region. Small firms are more likely to promote entrepreneurial development, because they give the employees a chance to work closely with the owner and learn how the business operates. Employees also are given a better perception of the current market conditions and the possible niche market opportunities by working in a small firm. Small firms are defined as those with under 100 employees.

Relatively Skilled Labor Force

Skilled labor is more likely to have a better understanding of how the business operates and the firm's organization of production. Skilled labor is also more likely to have the "know-how"

of starting a business and have the initiative to start a new enterprise. Members of a skilled labor force are more likely to notice market opportunities.

Relative Large Proportion of Management and Professional Occupations

Persons who work in management are more exposed to the market and have a better perception of the market opportunities. Managers generally have a more comprehensive knowledge of how the production process works than a "blue-collar" employee. They also are more likely to become entrepreneurs because they have experience managing interpersonal relationships.

Flexible Specialization Organization of Production

An employment experience that promotes the cumulative acquisition of skill is thought to be very important in the development of entrepreneurship. Flexible specialization promotes this cumulative acquisition of skill because with this method of production employees learn three or four skills while working in small groups. Also with this method employees gain a better understanding of how the entire system works than with mass production systems. Working in groups also develops the ability to work in interpersonal relationships.

Low Barriers to Entry

Extensive capital requirements and high initial operating costs are large obstacles for most potential entrepreneurs to overcome. It is difficult for most entrepreneurs to overcome huge barriers, and their existence often prevents potential entrepreneurs from even attempting to start a new enterprise. For a manufacturing industry to be a potential seedbed it must not have substantial capital requirements and initial operating costs.

Pool of Trained Labor

There has to be the existence of a pool of labor for the entrepreneur to pull from. For a seedbed effect to occur there must be sufficient labor to staff the new establishments.

Existence of Business Networks or Associations

Networks and associations can be very helpful in providing the entrepreneur with information on the market and the productive process. They can also be helpful in transferring technology information and with the co-training of labor. They are also useful in creating "friendly" relationships between local firms so that the firms do not consider other local firms rivals. The "friendly" environment and the transfer of information can be very helpful to potential entrepreneurs.

Supportive Environment

It is very important for the local population to be very supportive of entrepreneurs and business activity. It is vital that people in the community not look down on business failures. If business failures are seen in a very negative context, potential entrepreneurs will be reluctant to start a new business. A supportive environment also includes the existence of many supporting services such as accountants, lawyers, etc.

Entrepreneurial Culture

The presence of entrepreneurs in the local community provides role models to the potential entrepreneurs. It is very important for a potential entrepreneur to have someone to model in starting a new business. Without role models and exposure to new business start-ups, it is unlikely that a person will engage in entrepreneurial activity.

Accessibility to markets, suppliers, and transportation

The potential entrepreneur must have relatively easy access to the market. If there are barriers like distributors or dealers, it will be difficult for the new enterprise to get started. Easy access to suppliers and transportation are very important to minimize costs.

Significant Proportion of Purchased Inputs are Intermediate Goods

If a company purchases a significant amount of intermediate goods then an employee might perceive of an opportunity to establish a firm that could supply the original firm with an intermediate good for a lower cost.

Market Growth Potential

A spinning-off process cannot sustain itself if there is no room for growth and if an increase in the number of firms only leads to a saturation of the market. Generally, growth potential is associated with export-oriented goods because it is highly unlikely that there is enough local demand to maintain a spinning-off process. Plus, studies have shown that there is not a significant relationship between local demand and regional firm formation.

Case Study: The Houseboat Industry in the Lake Cumberland Region of Kentucky

In this section a case study of the houseboat manufacturing industry in the Lake Cumberland region is analyzed to see if a seedbed effect has taken place. Since there are several houseboat firms in the area, it appears that an agglomeration effect has taken place. Since boat building is considered a craft industry, the employees are presumed to be very skilled. For these reasons, the houseboat industry in Lake Cumberland area appears to be a plausible example of an industry that has experienced a seedbed effect. This study investigates the possibility that a seedbed effect has taken place and the presence of the hypothesized seedbed characteristics in the houseboat industry located in the Lake Cumberland region. Interviews with houseboat manufacturer owners and databases such as County Business Patterns and the National Industry-Occupations Matrix are the primary tools used to conduct this study.

The first issue that needs to be addressed is whether or not the agglomeration of houseboat firms in the Lake Cumberland area is an abnormality for this industry. If the only sign of agglomeration in the houseboat industry is in this region then this agglomeration might just be considered a fluke. By looking at the list of houseboat manufacturers in North America (see Table 1) and Figures 1-3 in the appendix, there is some evidence of other examples of agglomeration in this industry, but they are obviously not of the same level as the one around Lake Cumberland. Figures 1 and 2 show that in both Middle Tennessee and Northern Indiana there are three houseboat firms located in the same area. There is another example found by examining Table 1. There are four firms located in British Columbia, three of which are in the city of Sicamous. Granted, it can be noticed that many houseboat firms are located by themselves, but there is evidence of agglomeration effects in this industry outside the Lake Cumberland region.

It is often presumed that workers in houseboat manufacturing firms are highly skilled, but the relative skill level of the employees in the houseboat firms needs to be determined. The skill level of houseboat manufacturing employees is compared to the skill level of the employees in the primary industries in this region by examining the wage levels of the principal occupations for these industries. From County Business Patterns it was determined that the main industries in this region are Textile and Apparel Products and Lumber and Wood Products. Industrial and Commercial Machinery also appears to be a relatively important industry (see Table 2), and the Kentucky Cabinet for Economic Development has declared it a targeted industry for this region. Interviews with houseboat owners and The National Industry-Occupational Matrix were used to determine the principal occupations, and the wage levels were found from the 1995 Kentucky Occupational Wage Data : The Lake Cumberland Region (see Tables 3,4, 5, and 6). The skill level of houseboat employees as measured by wage level is of at least the same level or, in most cases, greater than the skill level of the workers in the two main industries (Textile and Apparel and Lumber and Wood Products). The skill level of the higher skilled houseboat employees (Welders, Machinists, Metal Fabricators) is of the same level as those in the Industrial, Commercial, and Construction Machinery and Equipment. The wage level may not be the best evaluation tool for the skill level of the occupations inherent in houseboat building because many of these occupations require a great deal of skill, even though they do not pay a relatively high wage—carpenters, plumbers, and mechanics serve as examples. So, there is evidence supporting the notion that the employees of houseboat manufacturing firms are relatively high skilled.

The signs of agglomeration in houseboat manufacturing firms outside the Lake Cumberland area combined with their

employees being relatively high skilled warrant further investigation of the houseboat industry in this region to see if a seedbed effect has taken place. The rest of this section provides a summary of the findings from interviews with houseboat owners, the Houseboat Association of America, and local development and Chamber of Commerce officials. Also, given in this section are general characteristics of the Lake Cumberland economy. This summary of how the houseboat manufacturing industry operates and general details of the local economy determines how many of the seedbed characteristics are present and whether or not a seedbed effect has taken place.

Previous employment experience of the owners/founders is very important in determining whether or not a seedbed effect has taken place. Owners in six out of the nine firms in the area have past experience in the houseboat industry, which looks very promising for a seedbed process until one learns about the previous experience of the owners. The story of how many of these firms developed is very interesting and must be briefly told to explain the situation. Around 1986, Somerset Houseboats suffered a very bad fire and went out of business for a brief time period. After the fire the former sales manager of Somerset Houseboats and four other partners with different backgrounds established Stardust Houseboats. The different partners played various roles in the business; some of them were involved in sales and marketing, while others were in charge of delivery and production. In 1993, differences on what direction Stardust should take in the future led to the divorcing of all the partners. The former sales manager of Somerset Houseboats is the only original partner left at Stardust. Since 1994, three of the former partners have started their own houseboat manufacturing firms which are Sunstar, Horizon Yachts, and Lakeview Yachts. The other owners with past experience are the owners of Sharpe and Thoroughbred Cruisers. The owner of Sharpe is the son of the former president of Somerset Houseboats, and he worked for Somerset Houseboats for a few years. The founders of Thoroughbred Cruisers had previously worked in the industry refurbishing houseboats.

According to the owners, acquiring the necessary funding and a skilled labor force were huge barriers to overcome in establishing the houseboat manufacturing firms. The initial capital requirements are extensive because of the high initial operating costs. Buying the necessary amount of aluminum, fiberglass, framing lumber, etc., to get started in the houseboat building business is very substantial. Plant equipment also contributes to the substantial capital requirements; fabrication machinery, press brakes, welders, and hand tools comprise the majority of plant equipment necessary for a houseboat. However, the amount of plant equipment needed is not that extensive relative to other manufacturing firms. Most of the funds used for establishing the firms were from personal accounts, but other sources include local banks and Empowerment Zone lending. Some of the firms are located in an Empowerment Zone, and because of this they are eligible for subsidized lending and tax credits. Many houseboat firm owners believe that the biggest constraints for most entrepreneurs to overcome are knowledge of how houseboats are built and having the necessary contacts to establish contracts with consumers while the firm is still in its infant stage. Some of the firm owners were able to get started because of contracts with rental companies before they ever built a boat.

Most of the houseboat manufacturing firms are small in terms of employment levels, and these levels vary greatly among firms. Seven out of the nine employ fewer than 100 employees, while Sunstar and Somerset employ around 175. The number employed varies from 10 (Thoroughbred) to around 175; most firms fall in the range of 45-80 employees. Most of these employees are “blue-collar” workers, and there are very few managers, administrators, or management support staff members (see Table 6). They train most of their workers in-house. A few of them occasionally use the local vocational school, but according to the owners the local

centers are either outdated or do not provide the necessary training for houseboat workers. Because employees have to be trained in-house, the poaching of labor has become a serious problem. However, since it is becoming such a prominent industry in the area, a pool of trained labor is emerging because many people view this as viable job opportunity.

The houseboat manufacturing firms do not have a trade association, and none of the firms are members of a network of firms. Due to the fact that many of the owners are former partners who broke off on bad terms and this can lead to the problem of labor poaching, the owners of the houseboat firms do not like each other. Because of this there is very little cooperation among these firms, and there is little or no sharing of information on new technologies, labor practices, or anything.

The organization of production can be characterized as a flexible specialization method. The different types of employees (welders, plumbers, etc.) work in groups performing tasks within their specialization. The employees are grouped by their occupation; the plumbers work with plumbers. With this organization of production workers are not necessarily able to acquire skills outside their occupation, but they are able to observe how the entire process of production is performed. They are able to make these observations because they work next to other teams of workers with different occupational skills and because of the small size of the firms.

The majority of the production process is done in-house. A few items are done outside, such the cabinets, heat pump, and engine, but most of the houseboat is produced within the factory. The firms purchase a majority of their inputs nationally, especially the "big ticket" items like aluminum, fiberglass, framing lumber, appliances, and engines. They generally purchase these inputs from more than one vendor, and they base their purchasing decisions on price and service. The houseboat firms do purchase some items locally, such as glass, doors, and "small ticket items" like parts. Cabinet making, drapery, and canvas work are about the only examples of the production process that are not done in-house and are actually done locally.

Depending on the size of employment, houseboat firms produce anywhere from six to eighty houseboats a year. The houseboats are sold directly to the customer, and they are custom made; they do not start making one until it is already sold. Currently, there is a two- to three-year waiting list at most houseboat manufacturing firms, which implies that demand for houseboats is very strong. Most firms sell a large percentage of their boats for use either on Lake Cumberland or on Dale Hollow Lake in Tennessee, which is very close to this region. However, they do sell boats all over the country. The other large markets are Lake Powell in Arizona, Lake Lanier in Georgia, Cedar Hill Lake in Nashville, and Lake Quachatia in Arkansas. Most of the houseboat firms sell boats to rental companies, and for these firms around twenty-five to thirty percent of their boats are sold to these companies.

Once the firm is established, advertising its product is not as important an aspect of the houseboat manufacturing industry as it is in other industries. All of the firms advertise in houseboat magazines, but their primary method of marketing their good is by word-of-mouth and customer satisfaction. Stardust and Somerset also each take a boat to at least one boat show a year, and some of the other firms set up a booth at these shows. The main reason that most firms do not put a boat in one of these shows is the huge expense associated with this. One owner noted that advertising is not a necessity in this business because most customers come to them because of Lake Cumberland region's reputation as being the "Houseboat Capital of the World."

The houseboat manufacturing industry contains many characteristics of a seedbed, including small firm size, relatively skilled labor force, and the flexible specialization organization of production. The houseboat industry in Lake Cumberland is relatively close to a majority of its potential market because of the lake and the fact that firms are close to a

majority of their competition. So far the market for houseboats has been strong enough to maintain the growing number of houseboat manufacturing firms entering the market, but the sustainability of this growth is questionable. It seems likely that an economic downturn could drastically reduce the demand and the waiting list for houseboats since they can be regarded as a luxury good. Another important issue is what happens once the market for houseboats becomes saturated, and it appears the market is approaching the point of saturation due to the dramatic increase in the new firms in the last few years. Once the market becomes saturated it is doubtful that the market can support all of the existing firms, much less any new firms.

Although it is not vital that the houseboat industry contains all of the important factors, many of the essential ingredients for a seedbed are missing from this industry. The houseboat firms have a very low percentage of managers, administrators, and support staff, and it is generally believed that persons in managerial occupations have a better understanding of how the entire business operates, not just the production or the marketing of the good. These people are also more likely to perceive an opening in the market for a new business. As previously discussed, most houseboat firm owners think that the major constraint to a potential entrepreneur in this industry is both understanding the production process and having the necessary contacts and knowledge of the business. Another missing ingredient is low barriers to entry. Although the plant equipment required is not substantial, both the high initial operating costs and having the necessary contacts to acquire the necessary consumers and contracts in the infant stage of the business serve as major barriers for an entrepreneur to overcome. The lack of networking or business association is another missing characteristic. Without this condition, there is no support or help for a potential entrepreneur to call upon. Most of the production of houseboats being done in-house creates another important missing factor in this industry. In-house production reduces the number of market opportunities that a potential entrepreneur can perceive.

As mentioned earlier in the paper, it is also very important for the community to have certain characteristics for a rural manufacturing firm to have seedbed potential. An entrepreneurial culture and a supportive environment are two important factors of a potential seedbed. Since the creation of Lake Cumberland, there has been an enormous outbreak of entrepreneurial activities in this region for such a rural area. The number of houseboat manufacturers is just one of many examples, although most of the new enterprises have been in service oriented businesses. It is presumed that there exists a supportive environment of entrepreneurship because so many entrepreneurial activities have occurred in this region, and this presumption is supported by the many examples of people starting two or three businesses.

However, the Lake Cumberland region does not contain all of the important conditions that provide seedbed potential, and it might not be considered the most advantageous location. It is difficult to characterize the work force in this region as skilled. Textile and Apparel products and Lumber and Wood products, as previously shown in this paper, are the primary industries in this area, and these industries require very few skilled workers. Most of the employees in these industries are semi-skilled labor (see Tables 3 & 5). Although, as mentioned earlier, a pool of trained labor for the houseboat manufacturers is developing because of the perceived job opportunity. This region is close to I-75, but it is not the most accessible place to transportation. It is a couple of hours from the nearest airport. According to most houseboat firm owners there are few advantages for locating in this area. They only gave two reasons for locating in this region. The major reason was that the owners are from this area, and the second reason was the established reputation of the houseboat industry in the area.

Conclusion and Policy Implications

The notion of a seedbed is that certain manufacturing industries have the capability to create a spinning-off process. The logic behind this idea is that different manufacturing industries have different employment experiences, and industries in which the employees have the opportunity to accumulate many skills and to form an understanding of how the business operates promote entrepreneurial development. A seedbed process takes place if an employee breaks off from a company to start his/her own business in the same industry or in a related sector because of a perceived opportunity in the market. For a rural manufacturing industry to have seedbed potential, the industry and the community where it is located must have a set of important characteristics. These conditions include: small firm size, relatively skilled labor force, significant proportion of management and administrative occupations, flexible specialization as the organization of production, low barriers to entry, intermediate good comprising a significant proportion of purchased inputs, pool of trained labor, supportive environment, entrepreneurial culture, accessibility to the market, supplies and transportation, the existence of business networks or associations, and market growth potential. It is not necessary for the firm and the region to have all the characteristics, but enough of the conditions must exist so potential entrepreneurs are given a chance to acquire multiple skills and are exposed to an "entrepreneurial friendly" environment.

The houseboat industry in the Lake Cumberland region appears to be a possible example of seedbed because it is considered a craft industry and because of the agglomeration of houseboat manufacturing firms in the area. The houseboat industry and Lake Cumberland area contain many of the essential characteristics, such as skilled labor, small firm size, flexible specialization production process, and entrepreneurial culture. However, after close inspection of the houseboat manufacturing industry in the Lake Cumberland region, it is very difficult to conclude a seedbed effect has taken place. First of all, it is missing a few key ingredients. A very low percentage of the employees are in management or administrative occupations, and huge barriers to entry exist due to the extensive initial operating costs and the importance of having the necessary contacts to attain contracts with consumers while the firm is in the infant stage of production. With most of the production being done in-house, very few of the inputs being intermediate goods, and just a few local suppliers, the seedbed potential is limited. These are indicators of linkages back into the community that can stimulate new entrepreneurs, which makes it very doubtful that a seedbed process took place. It is also hard to say a seedbed effect occurred due to the circumstances that led to the founding of many of the houseboat firms.

Even though it has been concluded that a seedbed effect did not occur in the houseboat industry in the Lake Cumberland region, it is possible to draw more insight about seedbeds from this case study. The unfriendly relations among the owners of the houseboat manufacturing firms highlight the importance of competition and conflict as a driving point of new firm formation. The case study also suggests that a manager and a factory or "blue-collar" worker need to break off together in many rural manufacturing industries to be successful in establishing a new firm in that industry or a related one. This implies that workers and managers need to work in close relations for a manufacturing industry to have seedbed potential so they can have the opportunity to work together and discuss the possibility to start a new firm. This case study also implies that personal funds could serve as a barrier to entry for most manufacturing

employees. Most of the funding used by houseboat firm owners came from personal accounts, and banks will only lend a certain percentage of the required funds in establishing a new business. Since most rural manufacturing employees do not earn a high income, it is very likely that most will not have the necessary funding to establish a manufacturing firm. Therefore, personal funding can serve as a huge barrier to entry for many manufacturing employees.

The notion of seedbed industries has many important policy implications for rural communities including the Lake Cumberland region. The notion of seedbeds allows local development officials to combine the strategies of industrial recruitment and indigenous entrepreneurial development. Communities with conditions that are supportive of entrepreneurship can concentrate their efforts on recruiting industries that have the characteristics of a seedbed instead of targeting and recruiting "footloose" industries that do not bring as many benefits to the community. Some regions may have industries with the essential seedbed factors, but they may not be experiencing a seedbed effect because they lack an "entrepreneurial friendly" environment. In this case the local officials can concentrate on developing the necessary conditions for entreprenuership in the local economy. With the case of the Lake Cumberland region, the development of a job-training program serves as one way that local officials in this area could help promote entrepreneurial development. If the program is run with the cooperation of the local firms and provides the appropriate training for the local industries, it can serve to create friendlier conditions among the firm owners. This can promote a more collaborative environment, which is an essential condition for a seedbed.

A seedbed strategy brings with it many advantages that are inherent in both industrial recruitment and entrepreneurial development. It can have a significant impact on the employment levels, and because of the characteristics of a seedbed it can increase the number of "good" jobs in the economy. Seedbed industries are less likely to uproot and leave the local area for two reasons. First, if a seedbed effect takes place then an agglomeration of these industries will occur in the area. Because of the advantages that an agglomeration offers to a firm and an industry, it is unlikely that a firm or an industry will leave. Secondly, a seedbed strategy, like an entrepreneurial development policy, promotes the local ownership of the businesses, which provides many benefits to the local economy including a lower probability that the firm will be "footloose".

Appendix 1

TABLE 1
LIST OF HOUSEBOAT MANUFACTURERS

Name	Location
Aqua Chalet	New Tazwell, Tennessee
Boatel Houseboats	Page, Arizona
Catamaran Cruisers	Columbia, Indiana
Cee Craft	Elkhart, Indiana
Desert Shore Houseboats	Centerville, Utah
Dream Cruiser	Elkhart, Indiana
Fantasy Custom Yachts	Monticello, Kentucky
Fun Country Marine	Muncie, Indiana
Gibson Performance	Goodlettsville, Tennesse
Golden Eagle Yachts	Malakwa, British Columbia
Harbor Master	Gallatin, Tennessee
Hill Hollow Technical	Bayfield, Colorado
Horizontal Yachts	Monticello, Kentucky
JRW Manufacturing	Palmetto, Florida
Lakeview Yachts	Monticello, Kentucky
Liberty Bell	Independence, Wisconsin
Medaris Marine	Russell Springs, Kentucky
Myacht	Goshen, Indiana
Patio Cruisers	Chico, California
Playcraft	Richmond, Missouri
Sharpe Houseboats	Somerset, Kentucky
Skipperliner	La Crosse, Wisconsin
Stardust	Monticello, Kentucky
Somerset Houseboats	Somerset, Kentucky
Sun Tracker	Springfield, Missouri
Sunstar Houseboats, Inc.	Monticello, Kentucky
Thoroughbred Cruisers	Albany, Kentucky
Three Bouys Houseboats	Sicamous, British Columbia
Twin Cruisers	Sicamous, British Columbia
Waterway Cruisers	Sicamous, British Columbia
Wave Length	Portland, Tennessee

Source: "List of Houseboat Manufacturers." Houseboat Association of America. www.houseboat.net and 1996 *Kentucky Directory of Manufacturers* (1996). Frankfort: Cabinet for Economic Development.

TABLE 2
PRINCIPAL MANUFACTURING INDUSTRIES IN THE LAKE CUMBERLAND REGION

Industry	Employment Levels	Number of Establishments
Textile and Apparel		
Men's and Boys' Shirts	100-249	1
Women's, Misses', and Children's Underwear	20-99	1
Girls' and Children's Dresses And Shirts	100-249	1
Girls' and Children's Outerwear	500-999	1
Knit Outerwear Mills	2500-4999	1
Men's and Boys' Suits And Overcoats	500-999	1
Men's and Boys' Separate Trousers and Slacks	100-249	1
Women's, Misses', and Juniors' Blouses and Shirts	250-499	2
Lumber, Wood, & Furniture Products		
Sawmills and Planing Mills	500-999	25
Wood Household Furniture	20-99	2
Hardwood Dimensions and Flooring Mills	550-800	7
Wood Containers	217	6
Machinery and Equipment		
Industrial and Commercial Machinery	0-19	2
Electronic and Other Electronic Equipment Equipment	271	5
Air-Conditioning and Warm Air Equipment and Industrial Refrigeration Equipment	500-999	1
Motor Vehicle Parts & Accessories	250-499	2
Houseboats	600-750	9

Source: *1995 County Business Patterns*, Bureau of the Census, Washington, D.C.

TABLE 3
OCCUPATIONS AND WAGE LEVELS IN THE LUMBER AND WOOD PRODUCTS INDUSTRY IN THE LAKE CUMBERLAND REGION

Principal Occupations	%Total Employment	Mean Wage($)
Executive, Administrative, and Managerial	6-7%	17.10
Managerial Support Occupations	1-2%	14.00
Marketing and Sales	1-3%	10.20
Precision Production, Craft and Repair	22-29%	
Mechanics, Repairers and Installers	4-6%	6.90
Cabinetmakers and Carpenters	4-6%	7.40
Machine Setters, Set-Up Operators	16-21%	
Woodworking Machine Setters	9-15%	8.10
Head Sawyers and Sawing Machine Operators	6-9%	9.10
Hand Workers, Assemblers and Fabricators	4-12%	7.30
Transportation Operators	8-15%	6.00-9.30
Helpers, laborers and hand manual workers	16-20%	5.50-7.00

Sources: *1995 County Business Patterns*, Bureau of the Census, Washington, D.C., *The National Industry-Occupational Matrix*, Occupational Employment Statistics, Bureau of the Census, Washington, D.C., and *1995 Kentucky Occupational Wage Data for the Manufacturing Sector: Lake Cumberland Area* (1997). Frankfort: Kentucky Workforce Development Cabinet.

TABLE 4
OCCUPATIONS AND WAGE LEVELS IN THE INDUSTRIAL, COMMERCIAL, AND CONSTRUCTION MACHINERY AND EQUIPMENT INDUSTRIES IN THE LAKE CUMBERLAND REGION

Principal Occupations	%Total Employment	Mean Wage($)
Executive, Administrative, and Managerial	7-10%	17.10
Managerial Support	2-3%	14.00
Engineers	4-5%	9.80-21.90
Technical and Related Support	3-6%	8.30
Marketing and Sales	2-3%	10.20
Precision Production, Craft and Repair	20-30%	
Inspectors and Testers	2-5%	6.90
Machinists	3-12%	8.10
Tool and Die Makers	3-10%	13.90
Other Precision Metal Workers	2-3%	9.50
Machine Setters	16-20%	
Numerical Control Tool Operators	2-3%	n.a.
Machine Tool-Cut and FormSetting	9-13%	9.00-10.50
Punching Metal Setters	2-3%	9.50
Hand Workers, Assemblers and Fabricators	18-25%	7.30
Transportation Operators	2-3%	6.00-9.30

Sources: *1995 County Business Patterns*, Bureau of the Census, Washington, D.C., *The National Industry-Occupational Matrix*, Occupational Employment Statistics, Bureau of the Census, Washington, D.C., and *1995 Kentucky Occupational Wage Data for the Manufacturing Sector: Lake Cumberland Area* (1997). Frankfort: Kentucky Workforce Development Cabinet.

TABLE 5
OCCUPATIONS AND MEAN WAGE LEVELS IN THE TEXTILE AND APPAREL INDUSTRIES IN LAKE CUMBERLAND REGION

Principal Occupations	%Total Employment	Mean Wage($)
Executive, Administrative, and Managerial	5%	17.10
Marketing and Sales	3%	10.20
Precision Production, Craft and Repair	12%	
Mechanics and Installers	4-7%	6.90
Inspectors, Testers	3-5%	8.70
Machine setters, set-up operators	48-52%	
Textile and related setters	36-48%	8.10
Sewing Machine Operators	7-47%	6.40
Textile Bleaching and Dyeing Machine Operator	2-4%	8.30
Textile Draw-Out and Winding Machine Operator	5-25%	8.10
Hand Workers, Assemblers and Fabricators	3-7%	7.30
Motor Vehicle Operators	3%	6.00-9.30
Helpers and Material Movers	6-7%	5.50-7.00

Sources: *1995 County Business Patterns*, Bureau of the Census, Washington, D.C., *The National Industry-Occupational Matrix*, Occupational Employment Statistics, Bureau of the Census, Washington, D.C., and *1995 Kentucky Occupational Wage Data for the Manufacturing Sector: Lake Cumberland Area* (1997). Frankfort: Kentucky Workforce Development Cabinet.

TABLE 6
OCCUPATIONS AND WAGES IN THE HOUSEBOAT MANUFACTURING INDUSTRY

Occupation	Wage ($)
Executive and Managers	17.10
Administrative Support Occupations	8.30
Transportation Workers	9.30
Carpenters	7.20
Plumbers	5.80
Painters	6.00
Mechanics	6.90
Hand Workers, Assemblers and Fabricators	7.30
Machinists	10.50
Welders	10.50
Tile Setters	10.00
Electricians	8.80
Metal Fabricators	12.00

Source: Interviews with houseboat manufacturing owners, *1995 Kentucky Occupational Wage Data for Lake Cumberland Region*, and *The National Industry-Occupational Matrix*, Occupational Employment Statistics, Bureau of the Census, Washington, D.C.

Figure 1
Houseboat Manufacturing Firms in Northern Indiana

Figure 2
Houseboat Manufacturing Firms in Middle Tennessee

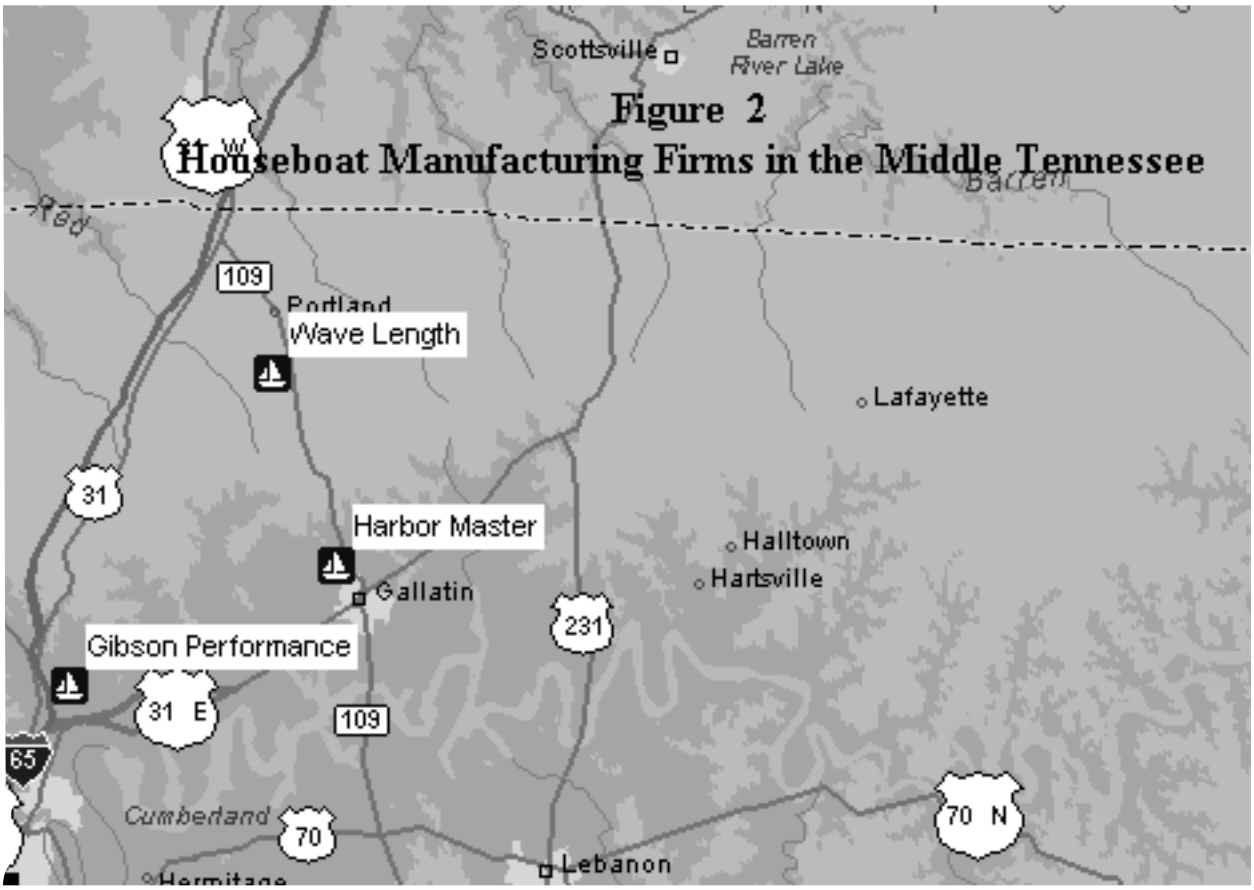
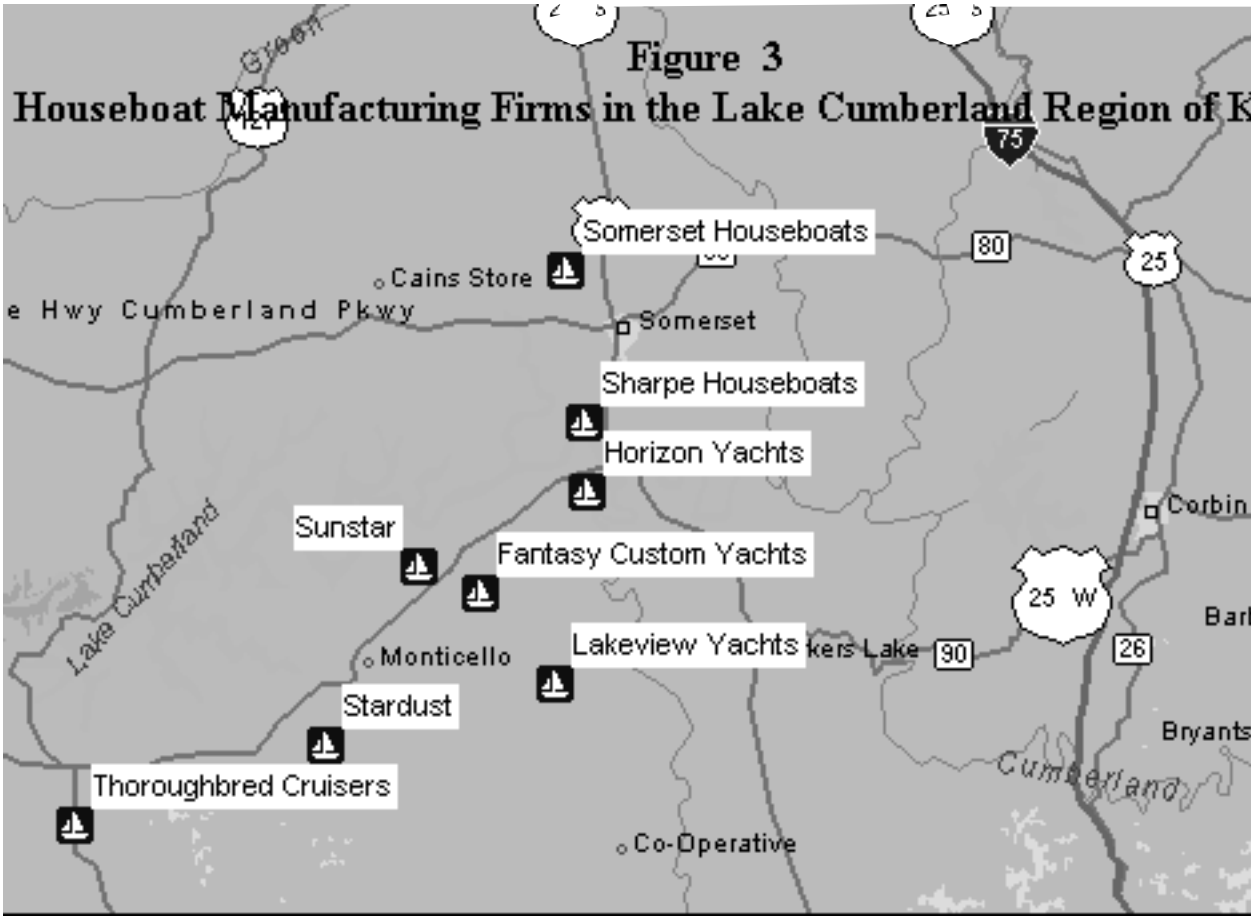


Figure 3
Houseboat Manufacturing Firms in the Lake Cumberland Region of Kentucky



Appendix 2

GENERAL SURVEY USED FOR INTERVIEW OF HOUSEBOAT FIRM OWNERS

History and Formation of the Firm

What was the previous experience of the owner/founder? Previous knowledge of houseboat industry?

What circumstances led to the formation of the firm? Is the firm locally owned? When established?

Has the development of the firm and the community been related?

Capital Requirements and Technology

What constraints were faced with the establishment of this firm? Were there extensive initial capital requirements?

How did you obtain the necessary capital to start the firm?

Amount of plant equipment necessary for production?

How rapidly is production technology advancing in the industry? Central source of technology and innovation?

Have you invested in flexible manufacturing technology?

Product Market

How are houseboats sold? (retailer or directly to customer) Are they custom made? Are there standard models? How many houseboats are produced in a year?

Do you deliver the houseboat?

What percentage of boats is sold locally? Do you export?

Do you sell to rental companies?

How do you market your good? The role of boat shows?

Production and Labor

How many are employed? What are the skill requirements for the different workers? Are these requirements changing?

What are the biggest challenges to the firm in the labor arena? How has the location helped or hurt? How would you classify the market for skilled labor in the area? Ever been problem of poaching of labor?

How would you classify your organization of production? Perform more than one task? Work in groups?

Are houseboats the only good produced? How many produced in a year? Compare to competition?

What is produced in house?

Inputs

What production inputs are purchased? Where do most of them come from? How many are purchased locally? How has this supplier relationship changed in recent years? Are you dependent on local suppliers?

Have any local suppliers started up because of the houseboat industry? Do any local suppliers have prior houseboat employment experience which led to firm formation?

Do you purchase your inputs based on price, quality, and timeliness of delivery?

Do any of the inputs have to be custom made?

Cooperation

Is there a local trade association? Any networking between firms? Share any information with local firms?

Competition

Where is most of your competition located? Nature of competition locally in industry? Are major competitors in this area?

How do you compete? (price, product differentiation, innovation)

Has competition changed in recent years? Are there many new entrants?

Misc.

What are the current constraints facing current employees from breaking off?

What state policy has helped/hindered in the development of the houseboat industry? What policies would help? (training, financing, innovation)

Have any officials from other states attempted to recruit you?

Are there any advantages of the local market?

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