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Planning For Chaos: Cluster Strategies Of Economic Development

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Planning For Chaos:
Cluster Strategies Of Economic Development

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Table of Contents

List of Tables

Abstract

With this thesis I will attempt to demonstrate the value of using chaos theory as a framework for understanding the emergence and development of clusters as a strategy for economic development. The application of the principles of chaos theory will be used to judge the relative success of specific clusters through a case study approach and historical analysis to determine the change agents and other significant factors influential to the growth of economic clusters. Because clusters are turbulent, non-linear systems that are sensitive to endogenous and exogenous triggers, chaos theory may provide the conceptual foundation appropriate to the study of economic clusters. A more thorough understanding of the emergence and development of economic clusters may illuminate policies and practices for regional planners, economic development professionals and policy makers.

Chapter 1: Introduction

In his 1988 article, *Shoot Anything That Flies: Claim Anything That Falls,* Herbert J. Rubin explores the uncertain and unpredictable arena in which economic development professionals work as quasi-public administrators beholden to both the general public and private business interests. He suggests a subtle process of inherent system bias as the main reason why cities often make concessions to business that seem to have little impact on economic development. This bias is the sum of many small decisions rather than the result of one or two major actions that tilt toward the business community. "System biases emerge as a reasonable accommodation to the daily uncertainty practitioners, both economic developers as well as other public administrators, confront in their jobs" (Rubin, 1988, p. 263). Rubin asserts that the clearly defined and bureaucratically obtainable demands of private business provide obtainable and predictable goals to administrators working in an uncertain, complex, and undefined environment. "In response, they seek out the appearance of some certainty in their task by adopting a philosophy of 'shoot anything that flies; claim anything that falls'" (Rubin, 1988, p. 264). In so doing, practitioners are able to define their work as a response to business demands, substituting the vague task of community economic development with well-defined concrete steps, effectively replacing uncertainty with certainty.

The field of economic development has a history of long-term failures based on short-term thinking and trend following. The chasing of smoke stacks with the lure of subsidies and the promotion of convention centers, sports arenas, casinos are all common strategies used by economic development practitioners today. These strategies have a few things in common; they are top-down strategies that don't always deliver on promises of trickle down effects on the local

economy. Also, they are oftentimes one-size-fits-all strategies that neglect to take into account

the unique physical and economic landscape of their prospective cities.

One of the most promising economic development strategies in recent years has been the

identification and development of clusters as outlined in *The Competitive Advantage of Nations*

by Harvard Business School professor, Michael Porter (1990). Porter first defined economic

clusters as "groups of interconnected firms, suppliers, related industries, and specialized

institutions in particular fields that are present in particular locations" (Porter, 1990, p. xii).

Although the clustering of related businesses is nothing new in the field of economic

development, its nature and importance have changed in the face of increasing globalization and

the rise of a knowledge-based economy in some countries. "Even as old reasons for clustering

have diminished in importance with globalization, new influences of clusters on competition

have taken on growing importance in an increasingly complex, knowledge-based, and dynamic

economy" (Porter, 2000, p. 15).

Economic clusters are groups of related businesses and institutions in close proximity to

one another. Their strength can be found in the connections and relationships between these

entities. Thus the value of the cluster can be greater than the sum of its parts. Clusters are many-

factored, dynamical systems that are often unpredictable. By viewing clusters as chaotic

systems, a deeper understanding of how cluster components interact as well as how the entire

cluster develops can be attained.

Over the years, little has been written about chaos theory in relation to urban planning,

although it has produced some exciting and spectacular results in fields such as meteorology,

ecology, epidemiology, cartography, and economics. Some theoretical (Dendrinos, 1985;

Wilson, 1981, 2000) and applied research (Batty and Longley, 1987, 1988) has suggested a link

between planning and chaos theory, but much more empirical work is needed to discover the effects of chaos on planning. One article by T.J. Cartwright in the *Journal of the American Planning Association* points to this deficit in the literature and suggests that chaos theory can have profound implications for planners in terms of analysis, plan making, and implementation (Cartwright, 1991). Much of what planners do is based on their ability to successfully predict both the future state of their cities and also the outcomes of their proposals. Failure in this arena is often attributed to incomplete information, lack of resources, and faulty models. Cities, though, are inherently unpredictable. According to Cartwright: "The 'beauty' of chaos theory lies in its disturbing integration of order and disorder, certainty and uncertainty, calm and turbulence. This integration has profound implications for planning. They extend to both analysis and intervention—to the way in which planners try to understand the world, and their efforts to change it" (Cartwright, 1991, p. 8). An understanding of cities as chaotic systems can help planners adjust to the limits of prediction, much as meteorologists have devised ensemble forecasting methods that produce a likely range of a hurricane's path and intensity. Rather than attempting to artificially instill order on chaos, planners may acknowledge the creative potential of chaotic systems and devise strategies that work with chaos, encouraging it when necessary, to bring about positive results.

This thesis will explore the properties of clusters in general and the Louisiana film industry cluster in particular by examining them through the perspective of chaos theory. It is hoped that by viewing the economic development of cities as dynamical systems that are inherently chaotic, we will gain a more holistic perspective on cluster development methods. The implications of chaos theory may prove relevant to many areas of planning, such as land use, housing demand, traffic flow, and migration patterns. Taking a larger view, chaos theory as it

relates to urban planning may give scientific credence to locally driven strategies for economic and community development such as those proposed by Jane Jacobs.

The following research questions will be explored:

- *Can the principles of chaos/complexity theory provide a useful framework for the study of economic clusters?*
- *Are some types of economic clusters (traditional manufacturing v. information technology or creative industries) more or less appropriate to the chaos/complexity framework?*
- *Can chaos theory provide useful strategies that can be implemented by economic development planners?*

Chapter two outlines a brief history of economic development policies and strategies, highlighting the dominant trends over time and their theoretical roots. Chapter three will provide an overview of the cluster strategy for economic development, noting the growing importance of clusters in an increasingly complex, knowledge-based economy. This section will also point toward the reasons why some clusters are more successful than others.

Over the years, chaos theory has instigated a number of spin-offs theories such as complexity, bifurcation, dynamical systems, edge of chaos, etc. For the purposes of this paper, we will refer to these similar concepts only as chaos theory. Chapter four will illustrate the key components of chaos theory. It is important to note here that the term "chaos" does not imply disorder or randomness as it does in common usage. With roots in the science of physics, chaos theory is increasingly finding acceptance in the physical, social, and applied sciences as a way of gaining a deeper understanding of certain complex, unpredictable systems. Chapter four will

relate the components of chaos theory to the economic development of cities in order to demonstrate the appropriateness of this framework for the study of clusters.

In chapter five we will examine the Louisiana film and digital media cluster using a case study approach. This particular cluster was chosen because it is representative of the type of creative industry that involves new technology that many cities are currently vying for to increase their economic potential. An analysis of the results obtained from the case study will be presented in chapter six. Conclusions and implications for policy will be presented in chapter seven, along with recommendations for using an understanding of chaos theory to develop strategies with potential for practice by economic development professionals.

Chapter 2: Economic Development: An Overview

Regional economic development is an evolving field with no set unifying principle, no one theory to guide it, and no one-size-fits-all strategy. While local politics and private business interests determine much of what actually happens in a given locality, economic development professionals struggle with questions of how external forces affect their local areas and how economic trends express themselves spatially. They strive to adjust to the dynamics of new markets in order to maximize economic competitiveness while hampered by the constraints of unpredictability, incomplete information, and the pressures of political cycles. Many resort to following trends such as: waterfront redevelopment, stadiums, convention centers, and casinos. Lacking an appropriate context, many of these strategies have not lived up to their promises of high multipliers, increased jobs and higher tax revenues. Subsidies are still offered in the hope of luring firms from the outside, sometimes giving more than is received. This has the added effect of increased competition for companies that disproportionally favors business over regions.

Perhaps the most promising strategy used by economic development professionals today is the cluster strategy. Clusters are groups of interconnected firms within a locality that realize advantages of productivity due to their proximity to one another. Implementation of cluster strategies, though, is often problematic. The concept is often misunderstood and practitioners strive in vain to create the next "Silicon Valley." Currently, the next big thing is biotechnology. In their efforts to lure biotech firms, many localities fail to recognize the inappropriateness of this strategy for their particular area and the near impossibility of creating a biotech cluster from scratch. In his 2002 Brookings Institution report: *Signs of Life: The Growth of Biotechnology Centers in the U.S.,* Joseph Cortright raises doubts about biotech attraction strategies currently

being pursued in the United States, noting that only nine metropolitan areas in the United States have significant clusters of biotech jobs.

Although it is widely known that groups of businesses have clustered together in cooperative and competitive arrangements throughout time, much of the current thinking on clusters stems from neoclassical economic tradition and also the social and institutional tradition. Explanations of cluster life cycles draw from product life cycle and industry life cycle theories.

Since the late nineteenth century, the neoclassical economic tradition has dominated economic thought. Neoclassical theory focuses on the equilibrium of economic systems and assumes that equilibrium can be attained if capital can flow without restriction. Assuming perfect competition, firms seek profitable opportunities and make locational decisions based on price and wages.

Alfred Marshall, in his 1920 *Principles of Economics,* identifies three reasons why groups of firms locate near one another: labor market pooling, supplier specialization, and knowledge spillovers. Marshall describes how the clustering of firms provides a rich market to suppliers, inspiring them to refine and specialize their expertise. He also notes an additional benefit to clustering in that knowledge and ideas moved easily between firms in industrial districts, a concept that economists now refer to as external economies.

Economic base theory suggests that the economic growth of a region is directly proportional to the demand for its products from outside the region. Local economic development strategies that derive from this theory seek to assist export over local or nonexport firms with the assumption that the growth of export business will drive the growth of supporting and service businesses. Many of the current strategies to attract high-technology firms draw on this theory.

Related to economic base theory are product cycle theories that illustrate innovation and diffusion processes. Product cycle theory suggests that new product development takes place in areas of substantial wealth where there is sufficient capital to invest in research and innovation. As new products are standardized and less dependant on highly skilled labor, production moves to areas with lower production costs.

In the 1950s, interest in the economy of place was revived by regional scientists such as Walter Isard. The regional scientists acknowledged Marshall's assertion that businesses benefit by proximity to other firms. They refined this idea further by distinguishing between localization economies (where benefits are achieved from proximity to firms in the same industry or industry group) and urbanization economies (where benefits are achieved from proximity to firms in other types of industries.) This fueled an ongoing debate over the relative importance of the two forms of external economies.

Over the past two decades, researchers have been exploring the use of increasingly sophisticated mathematical models to address the question of why firms co-locate. New growth theory departs from neoclassical theory in that it places knowledge and new technology, as non-rival goods subject to increasing returns, at the center of the system rather than as imports to the system. Thus, knowledge serves as the main driver of growth. The new economic geography models, such as the Dixit-Stiglitz model of monopolistically competitive markets, specifically seek to illustrate locational decisions based on increasing returns to scale (in which costs decline while scale of production increases) and monopolistic competition (in which competition is based on product differentiation rather than only cost.) Ottaviano, (2003) demonstrates how these models illustrate that clusters favor increasing returns to scale, ability to set prices, low transportation costs, and geographically mobile customers, workers, and suppliers. These

models often have no single deterministic solution and are subject to small, chance events that have long-term consequences. At present, more empirical research is indicated for these models, as they remain highly abstract.

Community practitioners in their economic development strategies commonly use attraction theories. These are based on location theories that suggest that firms make locational decisions based on labor, transportation and energy costs, supplier availability, educational facilities, and local government responsiveness. Communities strive to make themselves more attractive to business by offering incentives and subsidies. More recent approaches, such as those outlined by Richard Florida, have shifted the emphasis from attracting business to attracting skilled workers as a means of attracting the businesses.

Some economists, as well as many geographers, planners, sociologists, and political scientists do not view markets as the organizing principle of economic behavior. Instead they believe markets to be embedded in non-market, social relationships. They believe that social forces and relationships such as customs, technological change, organizational structure, and social networks influence the market decisions of individuals. Accordingly, the location of firms is impacted by the organization of production within and between firms. In their study of Italian industrial districts, Piore and Sabel, (1984) found that networked small firms, in contrast to one large firm, were able to respond quickly to changes in market demand and had succeeded in producing diverse, high-quality products in the international marketplace. Interest in Northern Italy as well as components and variations of these theories have shifted the thinking of economic development professionals toward strategies that focus on collaborative partnerships, comprehensive skill development, networks of business organizations and quality environments

that feature community capacity. This more holistic view of economic development has led to

the increasing prominence of cluster strategies.

Chapter 3: The Cluster Strategy

Definition

Among academics and practitioners there is a great deal of disagreement on what exactly constitutes a cluster and how it should be defined. Perhaps the most precise definition would be that of Michael Porter. According to Porter, clusters are: "Groups of interconnected firms, suppliers, related industries, and specialized institutions in particular fields that are present in particular locations" (Porter, 1990, p. xii). Porter expanded this definition in 2000:

> Clusters are concentrations of highly specialized skills and knowledge, institutions, rivals, related businesses, and sophisticated customers in a particular nation or region. Proximity in geographic, cultural, and institutional terms allows special access, special relationships, better information, powerful incentives, and other advantages in productivity and productivity growth that are difficult to tap from a distance. As a result, in a cluster, the whole is greater than the sum of the parts (Porter, 2000, p. 32).

The relationships between the elements of a cluster can be vertical, as in buyer and supplier networks or horizontal, as with common customers or technology linkages. The nature of these relationships may be competitive as well as complementary. Locations range from the very small, such as that of the Los Angeles jewelry district covering only a few blocks in downtown Los Angeles or quite large like the automobile manufacturing states of the Midwest.

In differentiating a cluster from a group of private firms, Stuart Rosenfeld identifies the minimal requirement of a cluster as: "a scale of demand that produces external economies, i.e. a sufficient number of firms with common or overlapping needs to create or attract more services and resources (including labour) than would be available to more isolated firms—and often at a lower cost. The dynamics of clusters are embodied in the value- and knowledge- adding chains among its members" (Rosenfeld, 2003, p. 360).

History

Although the clustering of industry as a business strategy is not a new concept, (economic geographers have long studied industrial districts, network regions, learning regions, territorial production complexes, and interindustry linkages) its identification is mainly attributed to Alfred Marshall and his 1890 study, *Principles of Economics,* of industrial districts in nineteenth century England. The current revival of the cluster concept is generally attributed to Harvard Business School professor, Michael Porter and his 1990 book, *The Competitive Advantage of Nations.* Porter argues in this book that factor inputs such as labor, natural resources, and capital by themselves are becoming less valuable in an increasingly global economy. Instead, he encourages the creation of healthy business environments and supporting institutions that enable regions to use and upgrade their inputs. Porter's cluster strategy puts emphasis on the importance on place from the firm's perspective. This reveals a paradox in today's thinking about economic geography. "It is widely recognized that changes in technology and competition have diminished many of the traditional roles of location. Yet clusters, or geographic concentrations of inter-connected companies, are a striking feature of virtually every national, regional, state, and even metropolitan economy, especially in more advanced nations" (Porter, 2000, p. 15).

With *The Competitive Advantage of Nations,* Porter illustrates how clusters support innovation and foster productivity growth. He demonstrates how clusters reduce transaction costs while boosting efficiency and inspiring the formation of new businesses. Clusters build on collective assets including information, specialized institutions, and reputation. Porter insists that government, schools, universities, consumers, professional societies and judicial systems as

well as private businesses all have a role to play in creating the conditions for higher productivity through his "diamond" theory of cluster development.

The diamond framework proposed by Porter relates four broad attributes: factor conditions, demand conditions, related and supporting industries, and firm strategy, structure and rivalry. These determinants, alone and in concert, create the context of a region's competitive advantage. This diamond is a mutually reinforcing system. "Ultimately, nations succeed in particular industries because their home environment is the most dynamic and the most challenging, and stimulates and prods firms to upgrade and widen their advantages over time" (Porter, 1990, p. 71). Porter views this dynamic system as one in which history matters and as one that is subject to chance events. Chance events, though, are somewhat more or less likely to occur depending on the strength and influence of the diamond's components.

Porter sees the role of government in influencing competitive advantage as significant, although only partial. He doesn't view the role of government as one of making things easy for firms through subsidies or trade barriers. He views competitive advantage as being emergent from challenge and adversity. Just as in biological evolution, "some habitats lead to stronger and more resilient species that are able to roam. They prosper in other habitats compared to those species that have evolved there" (Porter, 1990, p. 174). Furthering his analogy to biological evolution, Porter outlines how clusters encourage industrial diversity and that this results in accelerated innovation similar to how biological diversity propels the advancement of species.

Since its release in 1990, *The Competitive Advantage of Nations* has spurred a number of cluster-based initiatives in the United States and abroad on national, regional and local levels, in advanced as well as developing nations. The cluster approach provides an exciting new way of thinking about economies and economic development, transplanting emphasis from individual

firms to networks of firms and related institutions. This concept has also provoked a great deal of criticism.

Critiques of Clusters

When applied too broadly, the concept of economic clusters can include anything and everything. Thus the concept becomes meaningless. Due to the absence of a clear, mutually agreed upon definition of a cluster, empirical evidence proving the success of the cluster strategy has been elusive. Much of what has been identified as a successful cluster strategy can be attributed to the natural advantage of a particular location. Also, the ways in which the cluster strategy has been used in practice have sometimes resulted in inequity in the distribution of public resources.

While they note that they do not wish to debunk the cluster concept completely, Martin and Sunley, (2003) assert that clusters have received too much attention in recent years by academics as well as policymakers. "Clusters, it seems, have become a world-wide fad, a sort of academic and policy fashion item" (Martin and Sunley, 2003, p. 4). Martin and Sunley view the cluster concept's vagueness as being its primary flaw. "The key weakness is that there is nothing inherent in the concept itself to indicate its spatial range or limits, or whether and in what ways different clustering processes operate at different geographical scales" (Martin and Sunley, 2003, p. 16). Because the cluster concept is so elastic, it cannot provide a universal and deterministic model relating agglomeration to regional and local economic growth. Martin and Sunley suggest that policy directed at clusters is misguided. They view the cluster concept as limited because it isolates certain industries and neglects the rest of the economic landscape.

In a number of instances, locational advantage may be related more to location of natural resources and transport cost than to the presence of a cluster. Ellison and Glaeser (1999) studied the effects of natural advantage on agglomeration and found, using limited variables, that roughly 20 percent of observed geographic concentration is the result of a small set of advantages. They suspect that with better estimates, they would find at least half of observed geographic concentration is attributable to natural advantage such as that experienced by the wine industry in California. Ellison and Glaeser, though, do not rule out the influence of clusters completely. They found that the most agglomerated industry, the fur industry in New York, could not be explained by simple cost differences owing to natural advantage. "At the same time, there remains a large number of highly concentrated industries where it seems that agglomeration must be explained by localized intraindustry spillovers" (Ellison and Glaeser, 1999, p. 316).

One problem inherent in the cluster strategy is that the forces, such as path dependence and lock-in, which drive the success of a cluster, can also bring about its decline. Pouder and St. John (1996) argue that the economies of agglomeration that initially draw firms together erode in time. Innovation tends to decrease as firms define themselves according to the cluster to which they belong rather than to the entire industry market. They point to the economic devastation experienced in the minicomputer industry in Boston's Route 128 district and the mainframe industry in Minneapolis as evidence of the nature of clusters to decline as part of their evolution. Pouder and St. John suggest that, because of the element of chance involved in a cluster's start up, there is little that government can do to promote the formation and maintenance of clusters. Also, because it is in a cluster's nature to decline, there is little that policy can do to save it. Government resources, they suggest, would be better spent on all firms in a location. While it is

true that decline is a part of a cluster's life cycle, an understanding of that life cycle and recognition of the preliminary stages of decline may spur action in another direction.

Another criticism of clusters stems from the fact that there is little empirical evidence of their success due to the vagueness of the definition of a cluster, its boundaries, and scale. The evidence tends to be anecdotal and based on the success stories of particular locations. "Ultimately, it seems that it is impossible to definitively support or reject clusters with empirical evidence, as there are so many ambiguities, identification problems, exceptions and special cases" (Martin and Sunley, 2003, p. 37).

In her 2003 paper, *Fuzzy Concepts, Scanty Evidence, Policy Distance: The Case for Rigour and Policy Relevance in Critical Regional Studies,* Ann Markusen emphasizes this important theoretical shortcoming of cluster theory. She notes that the definition of clusters is "fuzzy," meaning different things to different people. The result, she insists, is that studies miss important data and do not provide clear methodologies for research and practice. Accordingly, spatial clusters tend to become whatever a practitioner wants them to be.

Unfortunately, the cluster approach has been distorted in many instances into policies of "picking winners" and favoring some industries over others. Much of this stems from a lack of understanding concerning the successful functioning of a cluster and a realistic conception of what policy can or cannot do to encourage them. Also lacking in many areas are realistic expectations for particular industries as they relate to specific locales.

Not another Silicon Valley

In his 2006 report on clusters for the Brookings Institution's Metropolitan Policy Program, *Making Sense of Clusters: Regional Competitiveness and Economic Development,*

Joseph Cortright analyzes the cluster strategy as a tool for economic development. He views clusters, rather than individual firms, as the key organizational unit for studying and enhancing the performance of regional economies. Cortright is careful to point out that different strategies are required for different clusters and that clusters should not be considered a one-size-fits-all approach to economic development. Cluster thinking, according to Cortright, can be used to orient economic development policy and practice toward the unique strengths of a region. He encourages government to develop policies that enable emerging clusters rather than trying to create a specific cluster from scratch.

Cortright advises cluster analysts to recognize the multiple dimensions to cluster relationships. These include: geography, social distance, technology, and production flows. The key to clustering is in the proximity of businesses and institutions in terms of these dimensions, as firms that are close to one another perform in different ways in relation to each other than those further apart. It is the relationships between firms that characterize the cluster.

Life cycle is also important to the analysis of clusters, as they tend to evolve through distinct stages with different factors driving each stage. Emerging clusters are characterized by rapid growth, many firm start-ups, and frequent changes. Established or mature clusters consist of fewer, but larger firms, fewer changes and slowed growth. Clusters in decline exhibit few changes in products, employment decreases, and a net loss of firms. Some regions identify potential clusters in an effort to create one where it does not exist. These, though, are largely imaginary.

Based on his review of the literature, Cortright has identified seven micro-foundations of clusters: labor market pooling, supplier specialization, knowledge spillovers, entrepreneurship, path dependence and lock-in, culture, and local demand (Cortright, 2006, p.18). All of these

micro-foundations, Cortright insists, are important to our understanding of clusters, although the relative importance of each is specific to particular clusters. Two of these micro-foundations: knowledge spillovers and path dependence/lock-in have strong ties to the principals of chaos theory and may provide key insights into the relative success of cluster formation and growth. These concepts will be explored in more detail in chapter four.

History and Structure Matter

One of the most commonly cited studies on cluster development and growth is AnnaLee Saxenian's *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. This work provides a thorough analysis of two similar clusters that have demonstrated widely different trajectories over time. Saxenian's study offers many insights into why the Silicon Valley technology region continues to prosper while Route 128 has declined.

AnnaLee Saxenian finds that the widely divergent paths of the two regions are attributable to important organizational and cultural differences that were a part of the their makeups from the start. Route 128 is composed of a smaller number of larger firms that are vertically integrated and self sufficient, whereas Silicon Valley comprises a larger number of smaller companies that are horizontally integrated and rely on networks of suppliers and contract workers. "Silicon Valley's network-based system supported a decentralized process of experimentation and learning that fostered successful adaptation, while Route 128's firm-based system was constrained by the isolation of its producers from external sources of know-how and information" (Saxenian, 1994, p. 9).

Saxenian's findings are backed by Rosenthal and Strange (2003) in their study of agglomeration economies and industrial organization. Rosenthal and Strange used mapping

software and a rich database to measure the geographic extent and nature of agglomerative externalities. They found that industrial structure and corporate organization have an influence on the benefits that arise from clustering within an industry. In particular, own-industry employment at small establishments presents a much greater attraction to potential new arrivals than does own-industry employment at larger establishments. This supports Saxenian's view that a more entrepreneurial industrial system promotes growth. This does not suggest that small establishments are necessarily more innovative than large establishments, but, rather, that innovation is more likely to diffuse throughout the region in networks of a large number of small firms as compared with regions with a small number of large firms.

In comparing Silicon Valley and Route 128, Saxenian found that the early histories of the two regions are crucial to understanding their varying degrees of success. Although both benefited from their links to major universities that encouraged commercially orientated research, the nature of those relationships differed. MIT established strong ties with Washington and large electronics producers, while Stanford lacked these associations and concentrated, instead, on the formation of new technology enterprises and cooperation with local industry. "This contrast—between MIT's orientation toward Washington and large, established producers and Stanford's promotion of collaborative relationships among small firms—would fundamentally shape the industrial systems emerging in the two regions" (Saxenian, 1994, p.12).

Critics of Saxenian, such as the late economic development scholar Bennett Harrison, argue that the current interest in clusters may be more of a revival than a substantial revision of earlier thinking. Harrison referred to the concept of clusters as "old wine in new bottles" (Harrison, 1992). Interdependence, though, is what differentiates a cluster from a group of

businesses and the emphasis is on nonmarket collaborative interaction employing a social-network approach.

Robert Hassink also stresses the importance of history and its effects on regional economics: "Of the few theoretical concepts that try to explain the decline of industrial areas, evolutionary regional economics, in general, and path dependency and lock-ins, in particular, are powerful ones, because they stress the importance of history and institutional context for regional development" (Hassink, 2005, p. 522).

Many of the concepts related to clusters such as path dependency, increasing returns, and lock-in bear a striking resemblance to the core principles of chaos theory. In the next chapter, we will examine the components of chaos theory and how they attempt to explain why the whole is greater than the sum of its parts.

Chapter 4: Clusters as Chaotic Systems

One of the common criticisms of the cluster strategy is that it sacrifices economic diversification for increased specialization. Thus, the promotion of industry clusters may have the effect of creating highly specialized regional economies that are vulnerable to economic downturns and cyclical declines in certain industries. Specialization and diversity, though, are not necessarily mutually exclusive (Glasmeier, 2000). A regional economy may be both specialized within certain niches as well as industrially diverse with the result being a mix of specializations within a broader context of economic diversity.

In *The Nature of Economies*, Jane Jacobs views economies and economic development as evolutionary systems in which certain universal principles of development apply. "Development is an open-ended process, which creates complexity and diversity, because multiplied generalities are sources of multiplied differentiations—some occurring simultaneously in parallel, others in successions. Thus a simple basic process, when repeated and repeated and repeated, produces staggering diversity" (Jacobs, 2001, p. 17).

Jacobs asserts that development depends on co-development in a web of interdependencies. She uses the analogy of a forest ecosystem to illustrate how self-sustaining systems are not entirely self-sustaining. Forests need infusions of energy, such as sunlight, from the outside and, over time, will diffuse energy from the system. The most successful systems are the ones in which a diversity of components within the system are able to reconvert, recombine and recycle. "Expansion depends on capturing and using transient energy. The more different means a system possesses for recapturing, using, and passing around energy before its discharge from the system, the larger are the cumulative consequences of the energy it receives" (Jacobs,

2001, p. 47). Jacobs suggests that, because of these principles, economies are open systems that expand by adding new kinds of work through import replacement.

Jacobs views economies as dynamic systems that must self-correct in order to survive. They maintain stability through self-correction in four ways: bifurcations, positive feedback loops, negative feedback controls, and emergency adaptations. Bifurcations involve a splitting away from an established trajectory such as the formation new business startups. Feedback loops refer to information regarding a system that the system both reports and responds to. This information can be monetary, demographic, energy supplies, etc. Negative feedback is evidenced in Adam Smith's invisible hand guiding prices and wages to equilibrium states. When labor in a poor country can be gained cheaply, factory owners can make great profits by locating there. This causes an increase in demand for labor as well as its cost. Positive feedback can be thought of as a self-refueling loop. Its results can be beneficial or damaging. Deficit financing is a good example of positive feedback with the potential for disastrous consequences. Emergency adaptations cover a wide range of responses to specific unusual circumstances. In difficult economic times, deficit financing may provide an effective solution to current problems. If sustained in flush times, it can create a vicious cycle through positive feedback. None of these methods are exclusive and each of these methods may have unintended, negative consequences. Understanding, though, the fundamental ways in which positive and negative feedback work can illustrate effective ways of nudging the system towards innovation and growth and away from stagnation and decline.

In *The Nature of Economies,* Jacobs compares economic evolution to biological evolution subject to the principles of chaos theory. Chaotic systems are open, dynamical systems in which small events, after a series of iterations, may produce large consequences. The results may be

positive or negative. Although the roots of chaos theory can be found in the physical sciences,

particularly in the study of thermodynamics, its implications are being explored in the fields of

evolutionary biology, economics, management, engineering, and meteorology, among others.

Chaos theory addresses the irregularities of nature. It includes such phenomena that Newtonian

science could only discount as anomalies. It does not seek to supplant the traditional paradigm

of science, only to add to it in instances where it has been inadequate. Chaos theory applies to

the patterns of clouds, the shapes of coastlines, fluctuations of wildlife populations, the paths of

hurricanes, and sudden crashes of the stock market. Although these entities may seem on the

surface to be highly disparate, they do share certain fundamental commonalities.

Within the framework of chaos theory, clusters may be seen as economic growth that is

self-reinforcing and is based on the spatial equivalent of increasing returns. This growth is

usually created by arbitrary or chance events that have cumulative effects. It is difficult, if not

impossible to predict, where and when a cluster will emerge, as multiple possibilities are inherent

in the system.

In his 2006 paper for The Brookings Institution, *Making Sense of Clusters: Regional

Competitiveness and Economic Development,* Joseph Cortright identifies the micro-foundations

that drive cluster development. These include: labor market pooling, supplier specialization,

knowledge spillovers, entrepreneurship, path dependence and lock-in, culture, and local demand.

Individual clusters are driven by some or all of these micro-foundations in different

combinations. Over a cluster's lifecycle, the importance of any of these micro-foundations may

change as some are more important to the establishment of a cluster and some are more

important to its growth. The first three—labor market pooling, supplier specialization, and

knowledge spillovers—date back to Alfred Marshall's reasons for clustering. Chaos theory is

especially concerned with two of these micro-foundations: knowledge spillover and path dependence/lock-in. These will be explored in more detail below. Other ways in which chaos theory may be related to cluster strategy are concerned with feedback loops, increasing returns, sensitive dependence on initial conditions, and emergence.

Sensitive dependence on initial conditions

Meteorologist Edward Lorenz, often referred to as the "Father of Chaos Theory," was one of the first to recognize the link between aperiodicity and unpredictability in complex systems while working with computerized weather models at M.I.T. in the early 1960s. In the classic tradition of scientific discovery by pure accident, he found that small changes in his model, as small as those going back to the sixth decimal place, could produce widely disparate results. (Previously, it had been assumed that small inaccuracies in input would produce small fluctuations in output.) Lorenz called this idea of sensitive dependence on initial conditions the "butterfly effect" and it has become the main image and driving force of chaos theory. It suggests that a butterfly flapping its wings in Brazil could result in a tornado in Texas.

This concept is realized in gentrified communities whose histories can be traced back over the years to the opening of one art gallery, bookstore, or coffee shop. It is also evidenced by large highway backups caused by the flash of brake lights of one car. AnnaLee Saxenian recognized this phenomenon in her examination of technological clusters in Silicon Valley and Route 128. "While Silicon Valley and Route 128 companies advanced similar technologies and competed in similar markets, the organization of production in the two regions diverged from the earliest days. Initial differences in social structures and industrial practices laid the foundation for the creation of two distinct industrial systems" (Saxenian, 1994, p. 29).

Bifurcations

Bifurcations can be seen as forks in the road. A system under stress reaches a tipping point and may be forced into new directions. These developments can be negative as well as positive as each development produces a new set of challenges and unforeseen consequences. In this process of bifurcation, the behavior of a system becomes increasingly chaotic and difficult to predict. Long-term prediction is impossible at this stage, while short-term or local prediction is possible if the location of the system is known at any one point in time.

When an economic system's instabilities become so severe as it cannot continue to operate as it has done in the past, it may make a radical change. A business in danger of becoming obsolete may adapt through bifurcation to produce new product lines. This may have the effect of necessitating new customers and new suppliers. An accumulation of bifurcations in a particular industry or region may change the character of that regions economic outlook. Corrections to an economic system may require changes in marketing to attract new customers, development of or attraction of employees with different skill sets, structural adjustments through joint ventures or mergers, etc. It is important to recognize that bifurcations are successful if brought about early, before the collapse of a system.

Knowledge Spillovers

Knowledge spillovers are commonly referred to by economists as "Marshall-Arrow-Romer" externalities. A key element in new growth theory involves the nonrival nature of knowledge as identified by Paul Romer (1986). In contrast to physical goods, knowledge can be reused without being used up. Thus, knowledge creation leads to increasing returns, as, although

the initial expense of knowledge formation may be high, the reproduction costs are often quite low.

When thinking about clusters, it is important to distinguish between two categories of knowledge, those of tacit knowledge and codified knowledge. Tacit knowledge is informal and shared through face-to-face contact. Codified knowledge is passed along through more formal means such as books and universities. It is slower than tacit knowledge in responding to rapidly changing markets and is associated with standardized mass production activities.

Tacit knowledge is an important component of localized specialization especially regarding new information industries. AnnaLee Saxenian recognizes the value of informal transfer of knowledge in Silicon Valley: "Entrepreneurs came to see social relationships and even gossip as a crucial aspect of their businesses. In an industry characterized by rapid technological change and intense competition, such informal communication was often of more value than more conventional but less timely forums such as industry journals" (Saxenian, 1994, p. 33). Knowledge diffused rapidly in Silicon Valley where, unlike Route 128, job-hopping was the norm. Existing skills combine with new ideas and technology, making it possible for firms to pursue many technological paths. In contrast, knowledge did not flow freely between the firms of Route 128 because of the lack of worker mobility in the region and the self-sufficient vertical nature of corporate structures. These vertical structures were successful during a time of volume markets and price-based competition, but were not well suited for an environment of technological and market volatility.

W. Brian Arthur, et al, (1997) view the process of learning and diffusion of knowledge as primarily social in nature and that recurring patterns of social interactions bind agents together into networks. This view is contrary to traditional theories that treat knowledge as exogenous to

the system. "These processes of learning and influencing happen through the social interaction networks in which agents are embedded, and they may have important economic consequences," (Brian, et al, 1997, p. 7).

One way in which knowledge can be tracked empirically is through incidence of patent citations. Jaffe et al, (1993) explored the paper trail left behind by knowledge spillovers in the form of patent citations. After studying the relationship between patent citations and geographical location and controlling for locational factors other than spillover, they concluded that the effects of location on patent citations to be quite significant statistically.

While it is obvious why businesses would cluster based on factors such as transaction costs and economies of scale and scope, knowledge spillovers are not so obvious. Caniëls and Romijn, (2003) looked to economic geographers to determine why information flows more easily across short distances. They found that businesses cluster in order to take advantage of knowledge spillovers because of the nature of the innovative process characterized by: uncertainty, complexity, a reliance on basic research, the importance of learning-by-doing, and cumulativeness. Business interactions, joint projects and labor mobility are the primary vehicles by which skills, knowledge and ideas travel across firms. These are facilitated by the relatively low transaction costs found in clusters.

The level of knowledge to be found in a particular cluster depends on where that cluster is in its life cycle. Mature clusters possess an established internal learning dynamic whereas emerging clusters tend to rely on external sources of knowledge.

Increasing returns

In *Making Sense of Clusters: Regional Competitiveness and Economic Development,* Joseph Cortright (2006) notes the work of W. Brian Arthur, Paul David, and other economists who have developed a framework for understanding the process of increasing returns. "They suggest that in many industries, particularly high technology industries, the combination of high upfront costs and low marginal costs, network externalities, and complementary investments produces a dramatically different marketplace than found in conventional decreasing-return industries" (Cortright, 2006, p. 24). In his 1989 paper, *Positive Feedbacks in the Economy*, Arthur (1989) asserts that conventional economic theory, with its assumption of diminishing returns engendering negative feedback and leading to a predictable equilibrium, is not an appropriate theory for the understanding of modern, high technology economies. He points to instances in the economy where the stabilizing forces do not operate. In these instances, positive feedback and increasing returns lead to multiple equilibrium points with no guarantee that the economic outcome chosen by the system will be the "best" one. Examples of this effect can be found in the selection of VHS over Beta, the current competition between HD-DVD and Blu-ray, and the dominance of the QWERTY keyboard over other models. In each of these instances, success is not necessarily due to superior technology, but, rather, to the cumulative effects of positive feedback on small initial leads in the marketplace. Arthur makes an important distinction here between economies that are resource based like agriculture and mining that are, for the most part, subject to decreasing returns and those that are knowledge based and are subject to increasing returns because the initial costs in research and development are high while reproduction costs tend to be low.

Arthur relates the same concept of increasing returns to localities. The first firm to enter an industry may choose a location based solely on geographical preference. The next firm's decision may be modified by the benefits to be gained by locating next to the first firm. The third firm's decision may be influenced by the decisions of the first two firms, and so on. In this way, industrial location becomes self-reinforcing. Arthur found that there are economies of agglomeration "if the net benefits to being in a location together with other firms increase with the number of firms in the location" (Arthur, 1990, p. 237).

Feedback loops

Feedback loops are mechanisms that facilitate the flow of information regarding a system that the system both reports and responds to. They are classified as being either positive or negative. Positive feedback loops intensify what the feedback is reporting while negative feedback loops negate what is reported.

Negative feedback loops are found in thermostat systems in which the heat discharged into an environment acts as its own trigger to shut down when it reaches a certain level. Much of traditional economic theory is based on the concept of negative feedback. One prominent example is of the free market and Adam Smith's invisible hand guiding price and wages to stable, equilibrium states.

In contrast, positive feedback works in a cumulative way to increase what has gone before. It can be beneficial, as in the case of growing clusters like Silicon Valley: "Nothing succeeds like success under external effects, and the private return to participation in these clusters of innovation by entrepreneurs, venture capitalists, technologists and those in the key supplier industries can be enormous" (Bresnahan et al, 2001, p. 839). Positive feedback can also

promote vicious circles that are self destructive, as is the case of transportation departments building new roads in order to ease traffic congestion. This often results in more reliance on automobiles leading to more congestion, fewer resources for mass transit, and the eventual collapse of public transportation. Positive feedback loops in the economy are often subsidized, often with the effect of reinforcing the vicious circle.

> Economic vicious circles are intended to solve problems, but they don't. The problems they're meant to solve persist; as solutions recede, the costs of temporizing continue to rise. . .Economic vicious circles are economic and political addictions. The most effective ways to cut them are with bifurcations instead of continuing as is (Jacobs, 2001, p. 100).

Path dependence and lock-in

The formation and growth of clusters is an evolutionary process in which history matters and each step has an influence on subsequent steps. One problem with path dependence and lock-in is that its effects can be negative as well as positive. Firms may become insulated from knowledge created in other localities and complacent in their own ways of doing things. This can be described as inbred thinking that inhibits adjustment to market conditions and may lead to a form of lock-in that causes decline rather than growth. The Detroit automobile industry is a good example of the complacency that can develop in a successful localized industry. While Japanese auto manufacturers were responding to customer demands of fuel efficiency and affordability, Detroit manufacturers were locked-in to traditional ways of doing business that had always worked for them in the past.

Both Silicon Valley and Route 128 saw a period of decline in the 1970s and 1980s. According to Saxenian, Route 128's decline stemmed from entrenched autarkic structures while Silicon Valley's semiconductor producers had "matured" into a more traditional model of mass production. "Strategies and structures dedicated to incremental refinements within a single,

30

established trajectory undermined the ability of these companies to respond rapidly to product and process innovations. Blinded by their own success, producers in both regions focused primarily on local competitors and failed to see the transformations that had not only changed the rules but indeed had redefined the game" (Saxenian, 1994, p. 103).

Robert Hassink (2005) identifies three forms of negative lock-ins commonly found in old industrial areas. These are: functional lock-ins based on inter-firm relationships, cognitive lock-ins associated with world views such as those that may confuse secular trends with cyclical downturns, and political lock-ins that favor existing structures rather than renewal and restructuring. "Particularly political lock-ins hinder the necessary restructuring processes in old industrial areas. They can be considered as thick institutional tissues aiming at preserving existing industrial structures and therefore unnecessarily slowing down industrial restructuring and indirectly hampering the development of indigenous potential and creativity" (Hassink, 2005, p. 521).

The Route 128 minicomputer industry followed the typical and predictable pattern of the product life cycle model: innovation, growth, maturation, scale production, and decline. Generally, geographical clusters develop during the phases of innovation and growth in order to take advantage of specialized skills and suppliers unique to that area, while production is often shifted to lower-cost regions as the product becomes standardized. When demand for minicomputers dropped, the region experienced decline. In contrast, Silicon Valley did not follow the product life cycle model, as competition there was based on continuous innovation, adding value and identifying new applications, rather than cost. Thus, Silicon Valley adapted as its semiconductor industry matured.

Regions can stave off negative lock-in through the encouragement of industrial and technological diversity. "The ease of new firm formation meant that many more technical paths were pursued in Silicon Valley than would have been possible in either a traditional large firm or a region with less fluid social and industrial structures. Most companies or stable regions pursue a single technical option and, over time, become increasingly committed to a single technological trajectory. A network-based regional economy like Silicon Valley, alternatively, generates and pursues a rich array of technological and organizational alternatives" (Saxenian, 1994, p. 112).

Emergence

Clusters are derived from a number of elements working independently in their own interests. "In the case of clusters, the independent but complementary decisions of a range of economic actors—entrepreneurs, workers, and investors—all converge to reinforce growth in initially successful places" (Cortright, 2006, p. 24). In this way, clusters resemble chaotic systems in which the whole is more than the sum of its parts. Hidden order is revealed as an emergence from a number of disparate elements.

Emergence of new start-ups was facilitated in Silicon Valley by an expanding network of specialist suppliers and service providers. Without having to manufacture every component of a product, entrepreneurs could rely on the technological infrastructure and were free to concentrate on their specific areas of expertise. "The industrial structure that emerged in this environment was highly fragmented. Silicon Valley's start-ups exploited the apparently limitless opportunities offered by electronics technology to differentiate their products, processes, and applications" (Saxenian, 1994, p. 43).

Chapter 5: Case Study: Louisiana Film and Digital Media

Overview

"After Silicon Valley, the film and television production business remains the largest high-tech, high profit, non-polluting industry in the world generating over $40 billion per year" (Louisiana State Governor's Office of Film & Television Development, 2006). According to PricewaterhouseCoopers' Global Entertainment and Media Outlook: 2005-2009, the global filmed entertainment market will grow at a compound annual rate of 7.1 percent through 2009 to $119 billion (Maturi, 2006).

The State of Louisiana has focused on the entertainment industry as part of its cluster strategy, believing that it is economically promising for Louisiana because 50% of a film production's total budget goes to direct expenditures in the local community where the shooting is done. This spending benefits a number of industries including: set equipment, crews, lodging, catering, vehicle rental, location fees, security, hair and wardrobe supplies, and many other miscellaneous expenses. After instituting an aggressive incentive program in 2002, the state of Louisiana experienced a dramatic jump in production to over $100 million. Before 2002, production averaged between $20 million and $30 million per year (CEIDR, 2006). Since July of 2002, Louisiana has attracted over $900 million in new film and television production (Louisiana State Governor's Office of Film & Television Development, 2006). The film industry has grown so rapidly in Louisiana over the past few years that many are calling the state, "Hollywood South."

Louisiana has made great strides to being competitive in the film and digital media industries, largely through the creation of tax incentives for film, music, and information technology. The entertainment industry was identified by the New Orleans Mayor's Office of

Economic Development as a promising cluster with a relatively high multiplier and the potential

to create a significant number of new jobs and tax revenues. In a study for the Alliance of

Motion Picture Arts and Sciences, David Friedman determined the economic multiplier for this

industry to be 2.12%. This falls within the range of multipliers used by the industry as noted by

the Association of Film Commissioners International (AFCI) of between 1.5% and 3% (AFCI,

2006). This industry, drawing on New Orleans' unique culture, also enjoys a symbiotic

relationship with tourism, which is currently the largest source of revenue for the city.

Despite the loss of film production in the state for four months following Hurricane

Katrina in 2005, the Louisiana film industry showed a 32 percent increase in production value

and revenue. The state attracted $550 million in production and $183 in revenue in 2005 as

compared to $375 million in production and $125 million in revenue in 2004. Revenue is

calculated as one-third of production value. Executive Director of the Governor's Officer of

Film and Television Development, Alex Schott estimates the final results of 2006 to align

closely with last year's (Louisiana State Governor's Office of Film & Television Development,

2006). A large percentage of production, though, has shifted to the northern part of the state,

mainly around Shreveport, after Hurricane Katrina. In 2005, 19 of the 28 films shot in the state,

or 68 percent, were filmed in the New Orleans area while only 37 percent of the state's

productions were filmed in New Orleans in 2006 (Webster, 2006).

Studios and producers, lured by a generous tax incentive package, enjoy working in

Louisiana. However, these studios often cite the main drawbacks to working in Louisiana as a

lack of in-state production facilities and a lack of skilled workers. While production studios

benefit from the state's film tax credits, those benefits may be lost in travel expenses incurred

from bringing crews into the state. Jeremiah Samuels, co-producer and production manager for

"Big Momma's House 2" suggests that the lack of skilled workers has been an issue for

Louisiana, but is optimistic:

> "The one thing missing was a larger and more experienced work force. We had to bring a lot of crew and equipment. But if the business is there and increases back to where it was before the hurricane, I'd imagine a lot of crew members would relocate to Louisiana. Where there's demand, these things will arrive to support it" (Webster, 2006).

Tommy Kurtz, senior vice president of Jobs Development for Greater New Orleans, Inc.

concurs: "Incentives are the hook, but you need a trained work force, great locations, and the

supporting sound/edit stage infrastructure" (Maturi, 2006). Increased film activity in Louisiana

in recent years has had the additional benefit of convincing recent graduates of local film schools

to stay in Louisiana. UNO film graduate, Lauren Heno was hired by Gwave Productions, a local

production company, after interning on "Runaway Jury" and "Mister 3000": "If I can work in

my chosen field here, it's a great way to keep me (in Louisiana) for a while. If I couldn't find

work here, I'd go where the work was" (Randolph, 2004).

Other leaders in the industry in Louisiana, though, have indicated that current facilities

are not working at capacity and the Hollywood producers would like to see a larger workforce in

Louisiana in order to bring labor costs down (Benisheck, 2006). Assistant Professor of Digital

Media at UNO, Robert Racine suggests that Hollywood production companies are reluctant to

hire high-level workers on location, preferring to work with people in California with whom they

already have experience. Racine recommends concentrating on the training of workers in blue-

collar type jobs in the industry such as grips, caterers and drivers (Racine, 2006).

Currently, the State of Louisiana has five film commissions registered with the

Association of Film Commissioners International (see Appendix). The State's Governor's

Office of Film & Television Development is a public agency within the State of Louisiana

Department of Economic Development. It serves as an informational clearinghouse and works

to provide technical assistance to businesses engaged in film and television production in the state. Activities of this office include: the maintenance of a comprehensive online directory of film-related personnel and services in Louisiana, acting as a liaison between production companies and state and local governments, the announcement of upcoming production employment opportunities in the state through a production hotline, maintenance of a digital location library, providing technical assistance to indigenous filmmakers, and the sponsoring of workshops, seminars and festivals (Louisiana Governor's Office of Film & Television Development, 2006).

The tax incentive package for film in Louisiana production was altered in 2006. As of January 2006, the State of Louisiana provides incentives solely for in-state production expenditures. Louisiana offers very competitive tax incentives (See Appendix), but other states are looking to benefit from such strategies. The Illinois State Senate recently passed legislation that would increase tax incentives in that state and also extend benefits to January 2009. Other states with competitive tax incentive packages include: New Mexico, Massachusetts, and Florida. Canada does approximately $5 billion in movie production annually (ReelChicago, 2006). Most studios and producers, though, would rather film in the U.S. when incentives are evenly matched. Racine indicates that New Orleans has an advantage over other U.S. cities because New Orleans has a culture that appeals to Hollywood bohemian tendencies. Racine contends that film culture is as important as technology and suggests developing and promoting that culture in New Orleans (Racine, 2006).

In October of 2006, LIFT Productions announced plans to build a nine-block-long, 320,000 square-foot film studio in New Orleans that will include sound stages, post-production studios, and vocational facilities to train film industry workers. These facilities are expected to

be full service entertainment production complexes supplying all of the digital media services required for film and television production and post production. The project is expected to cost $100-185 million and will be the first to receive federal tax-exempt bonds, totaling up to $150 million under the Gulf Opportunity Zone Act of 2005. A recent study estimates this project could create 2,253 direct and 1,517 indirect jobs and will generate $131 million in direct earnings (White, 2006). LIFT Productions CEO, Malcolm Petal believes this project will act as a catalyst to bring more filmmakers to the area: "We're going to build something that services in and of itself. This gives people a reason to shoot here even if we didn't have the tax credits" (Sternberg, 2006, p. 12). LIFT has partnered with Element Films on the production of between eight and fifteen films to be shot in Louisiana, expecting to bring more than $200 million to the state over the next three years.

New Orleans, as the birthplace of jazz, has a long history with music and a strong music culture responsible for thousands of jobs. Linking music to film and digital media, film scoring holds great potential for the entertainment cluster. New Orleans is home to a wealth of musical talent in film scoring who generally must leave the state in order to earn a living. Budgets for major motion picture scores, usually done in Los Angeles and London, can soar into the hundreds of thousands of dollars. Scores for midsize projects, in the tens of thousands of dollars, are usually recoded in Seattle and Salt Lake City. Standard pay for musicians is $60.00 per hour, and pay is higher for section leaders and conductors. Louisiana tax incentives also exist for in-state music investment.

Pre-Katrina, business, university and government leaders worked together to pass state legislation that would attract the high-growth digital media industry to Louisiana. Through this legislation, the state positioned itself to become a hub for emerging technology in the fields of

video games, educational software, and simulations with a variety of uses from medical to homeland security.

Hurricane Katrina has had an enormous impact on the film and television industry in New Orleans. Substantial infrastructure projects were cancelled, as were several feature film productions and a host of smaller independent films. Thirty-two productions were tentatively scheduled to film in New Orleans in the fall of 2005 (Smith, 2006). A few of these projects were put on hold, but many relocated elsewhere. The local businesses that support incoming production were also greatly impacted by Hurricane Katrina. Local vendors and suppliers were destroyed and key industry personnel were displaced. Many have followed productions to other parts of the state as well as to other parts of the country. Musicians and industry personnel have been displaced, without the ability to support themselves financially in New Orleans. Skilled workers in the IT industry have found jobs elsewhere while the training for skilled workers has been disrupted due to budget cuts in higher education (BNOB Commission, 2006).

Government Strategies

Louisiana's long-term master plan for economic development, Vision 2020, advocates a cluster strategy for developing the state's economy and ensuring its future competitiveness. The plan identifies nine high-priority industry clusters including entertainment and information technology. The cluster strategy focuses on developing linkages between competing and complementary companies, suppliers, and associated institutions and developing critical industry infrastructure in order to recruit out-of-state companies and support the development of local companies. Through partnerships that combine the information technology and entertainment

industries, the state government intends to put Louisiana at the forefront of the development of creative and highly lucrative digital media content.

Mayor Nagin's Bring New Orleans Back Commission has outlined a plan for recovery of the film, music and technology industries in New Orleans in the wake of Hurricane Katrina, involving the creation of an attractive business environment and the encouragement of private investment rather than federal funding for digital media. This would be accomplished through existing state legislation and a refocusing of federal legislation to entice various components of the industry to return to New Orleans. For example, in order to enhance existing Louisiana film and television incentives, two existing federal programs would be employed. These include a modification of IRS section 181 and the New Market Tax Credits.

The BNOB plan calls for the development of the digital media industry as a major source of new jobs and new opportunities for local business. Specifically, it proposes a digital media campus to house video game companies using the Louisiana Digital Media Act tax credits. It would include: a fiber optic connection to the Internet backbone, fully built animation capacity, software and project development pipelines, and the work space to accommodate 250 to 500 people. The plan also calls for the development of a unified, standardized academic program among the five major universities in New Orleans to educate the workforce required to sustain the industry. The plan requests $100 million of the CDBG dollars already allocated by the federal government to the state to be put toward rebuilding infrastructure and supporting university initiatives. No direct federal funding other than what is already available through GO Zone legislation would be required (BNOB Commission, 2006).

Proposed Digital Media Center

In accordance with the recommendations of the Bring New Orleans Back committee and the Louisiana Economic Development Council, the city of New Orleans is considering the construction of a $25 million, 60,000 square foot digital media center. It is expected that the center will facilitate the growth of the entertainment industry in the state and, in the process, create new jobs and new opportunities for local business. Digital media centers typically support the development of digital media related industries by providing the following:

- Production Facilities for Entertainment Industries

  Providing state-of-the-art facilities and support services for the production of digital media can increase the production of motion pictures, television shows, computer games and web content within a region. An increase in the activity of these industries can in turn create secondary benefits for additional industries, such as real estate, hospitality/tourism and transportation.

- Education and Professional Training

  Training a workforce with skills in digital media production can help to attract the production of film, television, computer game and Internet content to a region while improving the capacity of the local economy to capture the economic benefits created by these activities.

- Business Incubation

  Offering space and services for fledgling digital media companies will promote the creation of indigenous digital media firms. These homegrown industries will be instrumental in enhancing the region's reputation as a prime location for digital media production.

The Market for Digital Media Production Facilities

When examining the market for digital media production facilities, it is important to distinguish between facilities for film production and facilities for digital media production. Production space for digital media may or may not suit all the needs of film production. A digital media center could provide high capacity servers, fiber optic cables, equipment for capturing, editing and screening high definition video, facilities for recording, mixing and mastering high definition audio, and equipment for 3D animation, character design and compositing—all of which a film production may not use—while providing studio space that is too small for the production needs of most feature films. Likewise, studio space for film production may or may not have the facilities and equipment needed to record, create and manipulate images and sound digitally, though it can be expected that large film production complexes will contain facilities for digital media production.

The Robert E. Nims Center for Entertainment Arts, Amusements and Multimedia Industries is such a complex. In addition to 79,000 square feet of studio space, the Nims center offers a robust IT infrastructure, HD video and audio equipment, facilities for HD sound production and facilities for digital editing and 3D animation. Thus, while New Orleans does not currently have a full-fledged digital media center, a wide range of digital media production facilities is available. Roger Benisheck, director of the Nims Center, says that the center purchased its HD and digital editing equipment because no other facilities were offering these services in New Orleans at the time, but since 2002, there has been an adequate supply of film production related digital media production facilities in the city (Benisheck, 2006).

The supply of digital media facilities for commercial film production is likely to increase in coming years given current plans to build two large-scale film production facilities in and

41

around New Orleans. Louisiana Entertainment Associates has announced plans for a $250 million movie-making complex in Tangipahoa Parish, about 50 miles northwest of New Orleans. The complex, named Louisiana Cinema City Studios would include studios, production offices, a film laboratory, shops, restaurants, condominiums, and a golf course.

Demand for digital media production facilities is difficult to predict. Film production activity in the region is expected to increase in the future given the growth in film production activity before Hurricane Katrina, concerted efforts on the part of city and state governments to attract film production, and the recent announcements of large private investments in production facilities. However, the expected increase in demand for film production facilities on the whole will not necessarily translate into demand for facilities for digital media production. This is because digital media is mostly used in editing and other postproduction activities and, according to Dr. Benisheck, out of state production companies typically prefer to hire companies in their home states for these services. This preference is a product of the strong relationships that have developed over many years between film production companies and postproduction companies near their headquarters in Los Angeles and New York. Moreover, the development of high bandwidth communications technology has reduced filmmakers' reliance on postproduction facilities near their shooting locations. They can send audio and video to be enhanced and edited in Los Angeles and receive it back the same day (Benisheck, 2006).

The Market for Training in Digital Media

There are a number of colleges, universities and other institutions in the New Orleans area that offer training in entertainment related digital media. The film school at the University of New Orleans has a very good reputation and offers both graduate and undergraduate degrees

in film production. Students are drawn to this school for its relatively low tuition and the opportunity to get a hand-on education producing their own films (students in the "top 5" film schools generally work on other people's films). UNO is also the home of the Nims Center, which UNO faculty and students use extensively. Delgado Community College and South Louisiana Community College (SLCC) also offer training in digital media technologies. In 2002, SLCC introduced its Digital Media Initiative to train students in the use of professional quality high definition digital cameras and production equipment so that they could take advantage of the jobs created as a result to the tax incentives offered for film and video production.

Demand for training in digital media is difficult to ascertain. Film production companies have indicated that the paucity of labor with skills appropriate to film production is the most significant factor limiting film production activity in Louisiana. The state has responded by emphasizing training in its plans to attract greater film production to the state. However, an increase in film production activity by out-of-state production companies will not necessarily result in a significant increase in the demand for a local workforce trained in the use of digital media technologies. It is likely that production companies will seek professional digital media services from businesses located near their headquarters rather than businesses located in New Orleans (Benisheck, 2006). While it is true that an increase in film production activity in New Orleans will increase the demand for local labor, this demand will probably be for unskilled positions, such as caterers and drivers, or skilled production related positions, such as loaders, grips and gaffers, but not necessarily positions related to post production that require an expertise in digital media.

The Market for Digital Media Business Incubation

Currently, New Orleans has no incubation facilities for start up digital media companies. According to Dr. Benisheck, the Nims Center hosted small start-up businesses in its office space at one time, but evicted them because they were not profitable. The demand for a digital media incubator is small at the moment, but could become great in the future given the resources that the state and local governments are putting into digital media training and the planned expansion in the supply of digital media related training facilities. Many students at these new training facilities will want to start their own digital media businesses, and they will be looking for spaces and services to help them do so. A digital media incubator would help foster a grass-roots film and digital media industry that would simultaneously create local demand for digital media services while increasing the region's capacity to attract large-scale film productions by out-of-state firms. The result could be a beneficial cycle in which the expansion of local industries attracts production activity from outside the state, which in turn develops a workforce experienced in film production that allows local industries to expand further and improves the region's overall film production capacity. Given the undersupply of incubation facilities in the region, the significant potential demand for such facilities and the considerable benefits they could bring to the local entertainment industry, a digital media business incubator may form the centerpiece of the proposed media center.

Chapter 6: Analysis of Case Study

By offering attractive incentives, the state of Louisiana gained an early advantage over other states in attracting film and television business. Currently, though, several other states are offering similar incentives. If the state of Louisiana were to take a more holistic approach to building an infrastructure for the industry complete with job training, access to venture capital, networking opportunities and production facilities, the industry would be far more likely to take root in Louisiana regardless of what subsidies are offered. The film industry cluster in New Orleans and Louisiana as an economic system relates to the principles of chaos theory in the following ways.

Open Systems

Success or failure in the film industry is greatly influenced by factors outside the region's control. Competition from other states and other countries, most notably Canada, is especially fierce. Louisiana gained an early advantage with the introduction of tax incentives in 2002, but other states are following suit by offering similar incentives. If this continues, the film and television production industry may become just another "smokestack" being courted by numerous states with no real winner except the film production companies. The challenge for Louisiana is to distinguish itself in ways other than subsidies. The state can do this by offering production related infrastructure, the means for training skilled workers, and by bolstering film culture in the region as a way to draw skilled workers.

In *The Nature of Economies*, Jane Jacobs suggests that open systems expand by adding more and varied means for recapturing, using, and recycling energy before its discharge from the system (Jacobs, 2001). Projects such as the proposed digital media center for the City of New

Orleans may help to retain more postproduction work in the region and create added value to film products in keeping with Jacobs' assertion.

Sensitive Dependence on Initial Conditions

Small changes in the initial conditions of a system, through a process of iteration, can lead to large and unforeseen consequences. This concept is also known as the butterfly effect and is evident in the aggressive tax incentives offered in 2002 by the state of Louisiana. With these incentives, Louisiana gained an early lead in luring film business to the state. This has helped encourage filmmakers to return to the state and, in some instances, to set up shop in Louisiana. If the state can build on its film related infrastructure and its supply of skilled workers, many of these filmmakers will continue to do business in Louisiana no matter what incentives are offered in other states.

Self-Correction of Dynamical Systems

Dynamical systems must self-correct in order to survive. Jacobs maintains that self-correction occurs through bifurcations, positive feedback loops, negative feedback loops, and emergency adaptations.

- Bifurcations: Bifurcations have proven to be a key component to the success of Silicon Valley, where skilled workers change jobs frequently and often start their own companies. The many small firms of Silicon Valley, made possible by a culture of entrepreneurship, have greatly contributed to a high rate of knowledge spillover that has resulted in increased technological innovation. The film and television industry is similar to the computer industry in Silicon Valley in that it is composed of many small firms and many of the workers adhere

to specific projects rather than to major studios. Social networks are extremely important for these workers as a way of obtaining employment as well as for the sharing of ideas. Independent films have been a growing concern within the industry over the past several years. These small companies may exist only through the life of one project.

- Positive Feedback Loops: Feedback loops are mechanisms that facilitate the flow of information regarding a system that the system both reports and responds to. Positive feedback loops intensify what the feedback is reporting. It works in a cumulative way to increase what has gone before. As more films are shot in a region, more companies and skilled workers are drawn to that region, leading to increased production. Thus, a beneficial cycle of growth is created in the area.

- Negative Feedback Loops: In contrast to positive feedback loops, negative feedback loops negate what is reported. This phenomenon has not yet been experienced in Louisiana, but can be seen in California where the success of film industry has put a strain on local communities mainly because of noise and parking issues. Communities around Los Angeles have responded by calling for limitations on location shootings, causing film companies to look elsewhere.

- Emergency Adaptations: Emergency adaptations consist of a wide variety of actions taken in response to unusual circumstances. The film industry in Louisiana had been tested in 2005 by Hurricane Katrina. The hurricane had the effect of disrupting filming in the region for a period of roughly six months. Louisiana adapted by moving production to the northern part of the state, creating new opportunities there. The hurricane had also provided an additional benefit realized by renewed focus on this industry as a way to jump-start the economy and

47

through additional post-Katrina incentives such as the Go Zone legislation, which provides

tax benefits to businesses in the Gulf region through January 1, 2008.

Knowledge Spillovers

In contrast to physical goods, knowledge can be reused without being used up. Thus,

knowledge creation leads to increasing returns, as, although the initial expense of knowledge

formation may be high, the reproduction costs are often quite low. Tacit knowledge transferred

through informal face-to-face contact is of primary importance in the creative industries.

AnnaLee Saxenian recognized the transfer of knowledge as the primary driver of success in

Silicon Valley (Saxenian, 1994). She found that informal communication through social

networks is often of more value than slower moving conventional forums in industries

characterized by rapid technological change and intense competition. The film industry is

similar to the computer industry in Silicon Valley in that it is composed of loose networks of

skilled workers who are highly mobile and rely on social networks for the acquisition of informal

knowledge as well as future job prospects.

Caniëls and Romijn, (2003) found that businesses cluster in order to take advantage of

knowledge spillovers because of the nature of the innovative process characterized by:

uncertainty, complexity, a reliance on basic research, the importance of learning-by-doing, and

cumulativeness. The critical mass needed for such networks is most likely found in areas that

have a rooted film industry with a solid infrastructure and a substantial pool of skilled workers.

Increasing Returns

In contrast to conventional economic theory, with its assumption of diminishing returns engendering negative feedback leading to a predictable equilibrium, some economists suggest that some industries, particularly high technology industries, are more suited to a framework of increasing returns. This is due to high upfront costs and low marginal costs, network externalities, and complementary investments. Because films can cost several million dollars to produce, while reproductions can be made for only pennies, the film and television industry is subject to increasing returns.

Film businesses realize net benefits to being in a location together with other film businesses. Thus, the process of increasing returns to a locality results in economies of agglomeration for the industry. The location chosen by the industry in ten years could be any of the states currently offering film incentives, but will most likely be the one in which a few film related businesses have already clustered and where film industry infrastructure has been created.

Path Dependence/Lock-in

Although tax incentives specific to the film industry are being offered in thirty states and Canada, most major studios prefer to perform much of their postproduction work in California. The Los Angeles area offers the highest concentration of postproduction facilities and talented workers for these jobs that require highly specialized skills. Producers tend to work with those they already know and trust in this area. Thus, postproduction work is locked-in to California. It is important for other states to recognize that it is nearly impossible to lure an industry away from where it is so entrenched. At present, production work is highly mobile. It is difficult to predict where it is likely to become locked-in, if anywhere. If Louisiana can entice a critical

mass of suppliers, services and talent to put down roots in this state, it may capitalize on its early

lead gained from its incentives.

Emergence

As of 2006, the state of Louisiana and New Orleans in particular are experiencing what

may be the emergence of a substantial new industry in the region. The large-scale projects

proposed by LIFT and Element Films suggest that the private sector is confident enough that the

industry will take hold in the region, so much so that they are willing to invest in a new studio

and training facilities. It is too soon to tell if this venture will be successful or if it will draw

additional projects to the region, but it does represent the culmination of factors starting with the

introduction of tax incentives and including the development of supplier networks and an

increasing supply of skilled workers.

Chapter 7: Conclusions: Implications for Policy

Understanding the fundamental ways in which clusters work as dynamical systems has significant relevance for public policy. Instead of shooting anything that flies and claiming anything that falls, economic development professionals and policymakers can more accurately judge where to target limited resources using a cluster strategy.

Unpredictability is to be expected in situations where feedback loops, nonlinearity and self-organization combine in complex ways to make planning based solely on prediction inappropriate. Instead, planners should seek adaptive ways of working to make chaotic systems more robust. The implications of chaos theory highlight areas of an economic cluster's trajectory and growth cycle that can be bolstered by governmental action, making the entire cluster more resilient. These implications apply to both the analysis of clusters as an economic development tool and support of particular clusters at various stages of their life cycles.

Nearly all proponents of cluster strategies agree that it is impossible or nearly impossible to create a new cluster from scratch. It is, therefore, extremely important to accurately assess a region to determine what clusters may develop based on what is already there and how they relate to the region as a whole. In addition to documenting what industries are most prominent in an area, analysts may consider supporting industries and university involvement in the region with an emphasis on the connections between these entities.

Aside from tax incentives, Louisiana and particularly New Orleans possess a distinct natural advantage concerning the film and television industry. The state offers a wide range of location choices. While New Orleans has an architectural style that is uniquely its own, areas outside of the downtown area can pass for "anywhere USA." The region boasts a great many musicians and fine artists available to work on sets and scores. The University of New Orleans

already has a significant film school. Finally, filmmakers like to work in New Orleans because of its cultural and lifestyle offerings.

Recognizing the need to remain competitive with other states in the film and digital media industry, the state is focused on building a skilled labor force and production facilities to retain production expenditures in state. When implemented, these measures will help to cement the film industry to the region. Keeping in mind that it is often not the individual firms, but, rather, the connections between firms that contribute most to resiliency, the state would benefit from efforts to encourage dialogue and the creation of cooperative networks.

Instead of acting to lure postproduction work from major studios that are already committed to Los Angeles, the region can focus attention and resources toward local and independent filmmakers. The region can strengthen demand and supply links by first identifying weaknesses in existing cluster value chains and then attracting investors and businesses to fill those gaps. The encouragement of local start-ups would include training, access to venture capital and the provision of local services such as financial advice, marketing and design services.

Systems at the edge of chaos depend heavily on interconnected flows of information, much like the Internet. Planners can enhance the innovations brought by these networks by developing strong and varied relationships. Regional policy can be designed to catalyze and coordinate relations between public and private entities, fostering collaboration as well as competition. Perhaps, the most effective strategy for increasing the opportunities for new film start-ups is the development of educational and research infrastructure to foster innovation in the region and the creation of strong linkages between educational institutions and private industry.

In spite of the vast amount of research available on economic trends and the new economy, planners and policymakers still rely on fad-chasing strategies and subsidy packages to improve their region's economic outlook. Cluster strategies have become increasingly important, representing not a single development tool but a framework for understanding and building economies. In practice, though, use of the cluster strategy has often been as a one-size-fits-all tool for economic development, suggesting a gap between theory and practice. It is hoped that this study on chaos and clusters will provide a useful framework for bridging this gap.

Appendix

1997: Motion Picture and Sound Recording Industries, NAICS 512

Location	# of Establishments	# of Employees	Annual Payroll ($1,000)	Shpmts/Sales/Recpts ($1,000)
United States	22,204	275,981	9,392,048	55,925,533
Louisiana	171	2,013	22,589	132,274
New Orleans MSA	84	936	13,217	72,018

Source: American FactFinder, County Business Patterns 1997

2002: Motion Picture and Sound Recording Industries, NAICS 512

Location	# of Establishments	# of Employees	Annual Payroll ($1,000)	Shpmts/Sales/Recpts ($1,000)
United States	22,458	303,148	12,599,117	78,250,368
Louisiana	137	2,433	27,059	na
New Orleans MSA	71	1,167	13,443	na

Source: American FactFinder, County Business Patterns 2002

Selected Louisiana Filmography, 1929-2006

Year	Title	Year	Title
2006	All The King's Men	1993	House of Secrets
2006	2gether 4ever	1993	Mardi Grass for the Devil
2006	Auquamarine	1993	Night Trap
2006	Factory Girl	1993	Undercover Blues
2006	Glory Road	1992	Blaze
2006	Hacking Democracy	1992	Delta Heat
2006	Hoodoo for Voodoo	1992	The Gun in Betty Lou's Handbag
2006	The Initiation of Sarah	1992	A Lion Is In the Streets
2006	Mortal Kombat	1992	Storyville
2006	Not Like Everyone Else	1991	Highway 61
2006	Razor Wire Rodeo	1991	Zandalee
2006	Road House 2: Last Call	1990	Judgment
2006	Shaman's Mark	1990	Swamp Thing
2006	Stay Alive	1989	False Witness
2005	The Skeleton Key	1989	Fletch Lives
2005	Because of Winn-Dixie	1988	Unholy Matrimony
2005	The Dukes of Hazard	1987	Angel Heart
2005	Odd Girl Out	1987	The Big Easy
2005	Venom	1986	Crossroads
2004	Mr. 3000	1986	No Mercy
2003	Schultze Gets the Blues	1985	All The King's Men
2002	The Badge	1985	Badge of the Assassin
2002	Passing Glory	1985	The Long Hot Summer
2002	Video Voyeur: The Susan Wilson Story	1984	Louisiana
2002	The Scoundrel's Wife	1983	A Gathering of Old Men
2002	Thin Air	1982	Bayou Romance
2001	Above and Beyond	1981	Southern Comfort
2001	The Feast of All Saints	1979	The Evictors
2001	Taking Back Our Town	1979	The Night Rider
2001	Monster's Ball	1978	Child of Glass
2000	Hall of Mirrors	1978	Pretty Baby
2000	The Saint Francisville Experiment	1977	Life and Assassination of the Kingfish
1999	Bad City Blues	1977	Murder at the Mardi Gras
1999	The Collectors	1976	Gator Bait
1999	Double Jeopardy	1976	JD's Revenge
1999	A Murder of Crows	1976	Obsession
1999	Vendetta	1975	The Drowning pool
1999	A Lesson Before Dying	1974	The Autobiography of Miss Jane Pittman
1998	The Apostle	1972	Moon of the Wolf
1998	Fait Accompli	1972	Night of the Strangler
1998	The Farm: Angola, USA	1971	The Beguiled
1998	The First 9 1/2 Weeks	1970	WUSA
1998	Ruby Bridges	1967	Hurry Sundown
1998	Two for Texas	1965	The Cincinnati Kid
1997	Con Air	1964	Hush, Hush, Sweet Charlote
1997	Eve's Bayou	1964	See How They Run
1997	JFK	1959	Alligator People
1997	Rag and Bone	1959	The Fugitive Kind
1996	Albino Alligator	1959	Suddenly, Last Summer
1996	Codename: Silencer	1958	The Invisible Avenger
1996	Dark Angel	1958	King Creole
1996	The Glass Cage	1958	Yancy Derringer
1996	Heaven's Prisoners	1957	Band of Angels
1996	Sealed With a Kiss	1957	Bonnie and Clyde
1996	A Streetcar Named Desire	1956	The Adventures of Jim Bowie
1995	Candyman: Farewell to the Flesh	1956	Nightmare
1995	Dead Man Walking	1953	The Mississippi Gambler
1995	Felony	1953	Thunder Bay
1995	Kingfish	1951	Adventures of Captain Fabian
1994	The Client	1950	Panic in the Streets
1994	The Dangerous	1948	Docks of New Orleans
1994	French Silk	1944	The Mummy's Curse
1994	Gabriel Knight: Sins of the Father	1943	Revenge of the Zombies
1994	Interview With the Vampire	1941	Lady from Lousiana
1994	Murder Between Friends	1941	Louisiana Purchase
1994	The Pelican Brief	1939	The Cat and the Canary
1993	Deadly Relations	1929	Evangeline

Source: Louisiana State Law Library and Internet Movie Database (IMDb)

Selected Louisiana Television Series, 1959-2001

Year	Title
2001	Killer Instinct with Rob Bredl
1996-97	The Big Easy
1996-97	Orleans
1995-96	The Client
1995	Murder, She Wrote: "Big Easy Murder"
1989	Quantum Leap: "So Help Me, God"
1987-88	Frank's Place
1985	North and South
1971	Longstreet
1959-60	Bourbon Street Beat

Source: Louisiana State Law Library and Internet Movie Database (IMDb)

Louisiana Film Commissions

Name	Director	Address	Phone/Website
Baton Rouge Film Commission	Alicia Allain	730 North Blvd. Baton Rouge, LA 70802	225.382.3563 na
LA Governor's Office of Film and Television Development	Alex J. Schott	1051 North 3rd St. Baton Rouge, LA 70802	504.736.7282 www.lafilm.org
New Orleans Office of Film & Video	Stephanie Dupuy	1515 Poydras St., # 1150 New Orleans, LA 70112	504.658.0912 www.neworleansfilmoffice.com
Northeast Louisiana Film Commission	C.J. Sartor	P.O. Box 14092 Monroe, LA 14092	318.324.1644 www.nelafilm.org
Shreveport-Bossier Film Office	Betty Jo LeBrun-Mooring	P.O. Box 1761 Shreveport, LA 71166	318.222.9391 www.sbctb.org

Source: Association of Film Commissioners International

Louisiana State Tax Incentives, 2006

Tax Credit	Percent	Details
Investor Tax Credit	25%	Based on investments of $300,000 and higher
Employment Tax Credit	10%	Credit of aggregate Louisiana payroll
Infrastructure Tax Credit	15%	Of investment for the the construction of new production facilities
Digital Interactive Media Production Tax Credit	10-15%	Depending on the amount of investment with no more than $5 million in credits granted each year
Sound Recording Credit	10%	Of total music budget when total Louisiana music expenditures exceed $30,000
Sound Recording Credit	20%	Of total music budget when total Louisiana music expenditures exceed $100,000

Source: Louisiana Governor's Office of Film and Television Development

Louisiana Film Activity, 2005

Title	Description	Production Company	Budget (in millions)
All the King's Men	Feature	Sony	86.3
Big Momma's House 2	Feature	20th Century Fox	61.3
Bug	Feature	LIFT	6.4
Campus Confidential	TV movie	ABC Cable	4
Elvis	TV movie	CBS	7.4
Factory Girl	Feature	LIFT	6.4
Failure to Launch	Feature	Paramount Pictures	70.1
Faith of my Fathers	TV movie	A&E	5.1
Getting Lucky	Feature	New Regency	na
Little Chenier (Bayou)	Feature	Independent	na
Local Color	Feature	Independent	1.6
Locusts	TV movie	LIFT	11.5
Lubu	Feature	Independent	na
Pizza Wars	TV movie	ABC Cable	4.7
Retirement	Feature	Cornerstone Pictures	12
Roadhouse II	Feature	LIFT	4.7
Scarlett	TV pilot	Lifetime and Lions Gate	17.5
Snow Wonder	TV movie	CBS	4
Stay Alive	Feature	Endgame Entertainment	20
The Last Time	Feature	Element Pictures/LIFT	8
The Reaping	Feature	Warner Bros.	69
Thief	TV series	FX Cable	8
Vampire Bats	TV movie	LIFT	4

Source: The Times-Picayune and LA Governor's Office of Film and Television Development

Louisiana Film Activity, 2006

Title	Description	Production Company	Budget (in millions)
Deal	Feature	Independent	na
Déjà Vu	Feature	Disney and Bruckheimer	175
Dreamboy	Feature	Independent	na
Homeland Security	Feature	Millenium Films	na
Initiation of Sarah	TV movie	Disney and ABC Family	na
Life is Not a Fairytale	Feature	LIFT	na
Match Race	Feature	LIFT and ESPN	na
Mr. Brooks	Feature	LIFT	2.1
Not Like Everyone Else	Feature	LIFT	2.4
Perfect Day	Feature	LIFT	na
Philly Department of Recreation	Feature	LIFT and Lions Gate	5.6
Premonition	Feature	LIFT	21.5
Solstice	Feature	Endgame Entertainment	na
The Curious Case of Benjamin Button	Feature	Paramount Pictures	150
The Guardian	Feature	Disney	120.9
The Year Without Santa	TV movie	Warner Bros. and CBS	na
Travelers	TV pilot	FX and Fox	na

Source: The Times-Picayune and LA Governor's Office of Film and Television Development

Louisiana Film Expenditures, 2002-2004

	2002*	2003	2004**	Total
Number of days shot in Louisiana	90	237	390	717
Avg. amount expended per day in Louisiana	342,308	327,397	380,220	1,049,925
Number of companies shooting in Louisiana	2	6	8	16
Total amount expended per month	10,383,333	9,958,333	11,533,333	31,874,999
Total amount expended per year	62,300,000	119,500,000	69,200,000	251,000,000

Source: LA Governor's Office of Film and Television Development

*   only includes July 2002 through December 2002
** only includes January 2004 through July 2004

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