POST INDUSTRIAL PATHWAYS: THE ECONOMIC REORGANIZATION OF THE URBAN RUST BELT

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SIGNED: _____George Hobor_____

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ABSTRACT

Since the 1970s, waves of deindustrialization have dramatically transformed the urban Rust Belt. The plight of cities in this region is well documented by scholars. The story they present upholds central assumptions in theories of urban growth, mainly new cities grow in new economic regions at the expense of others. This dissertation challenges this notion by addressing the following question: What are the different economic trajectories Rust Belt cities have taken over the course of global economic restructuring from 1970 to 2000? In this research, 69 Rust Belt cities are classified into three different categories based on their performance on a quality of life index over this time period: stable, struggling, and devastated. Then, conventional quantitative methods are used to map changes in employment trends onto the cities in each category. This step provides a general picture of economic restructuring experiences in these cities, which shows all lose manufacturing employment, but increases in business services employment distinguishes stable cities while increases in professional services employment distinguishes devastated cities. Next, an innovative methodology is used to identify different kinds of economic transitions for different types of cities. The analysis shows larger, stable cities have been able to reorganize their local economies into producer service-based economies. It also indicates manufacturing remains central to the local economies in smaller, stable cities, and finally, all devastated cities are developing healthcare-based local economies. Finally, two stable and two devastated cities are examined in-depth to provide a detailed description of local economic transformations. The stable cities have combined local R&D facilities with a strong infrastructure of

specialty manufacturers to become high-tech production sites. This change has fueled business services development in these cities. Devastated cities are holding onto old manufacturing while greatly expanding hospital-based employment. Overall, this dissertation makes a contribution by using multiple and innovative methods to develop a rich portrait of the economic reorganization of the urban Rust Belt. This portrait questions central assumptions in theoretical understandings of urban growth and serves as a foundation for an examination of the causes of successful local economic transformation.

CHAPTER 1: INTRODUCTION

Beginning in the 1970s, the United States economy experienced the initial shocks of a prolonged decline from its post-World War II glory days. The nation's change in economic fortune was characterized by episodic crises in the Northeast and Midwest regions of the country. These regions, once known together as the industrial heartland of America, had a high concentration of manufacturers in industries that were especially vulnerable to foreign competition, such as producers of steel, machinery, and automobiles. Many of these manufacturers collapsed under the pressures of increased competition while others responded by migrating to locations where cheaper labor was available (Crandall 1993). The closings and "runaway shops" became part of a substantial disinvestment in America's productive capacity, called "the deindustrialization of America" (Bluestone and Harrison 1982). From 1979 to 1996, the U.S. lost approximately 43 million jobs, most of which were blue-collar manufacturing jobs in cities in the Northeast and Midwest (Uchitelle and Kleinfield 1996). This abrupt and massive job loss negatively impacted the cities in the industrial heartland, transforming them from sites of production and prosperity into urban blight in a struggling Rust Belt.

The creation of the urban Rust Belt is recognized by scholars in the social sciences as a feature of "global economic restructuring," a period of adjustment between the post World War II economy and the current global economy (see Sassen 2000; Ross and Trachte, 1990; Massey 1984; Gordon, Edwards and Reich 1982). This period of restructuring is also characterized by a "new international division of labor," which led to

the formation of new growth regions far removed from the old industrial regions and shaped a new set of economic roles cities in growth regions perform (Frobel, Heinrichs, and Kreyo 1979). The scholarly literature that addresses global economic restructuring assumes that cities located in regions of decline cannot adopt these new economic roles. Instead, they inevitably become victims of deindustrialization. Accordingly, existing scholarly research on cities in the Rust Belt maintains a consistent focus on the negative social and economic consequences of factory shutdowns (see Cowie and Heathcott 2003; High 2003; Staudohar and Brown 1987; Smith and Feagin 1987). The focus on these negative effects is warranted, as deindustrialization has been, and continues to be, a disruptive force in Rust Belt cities. However, the consistent emphasis on decline has resulted in little research on how these cities have struggled to reorganize their local economies to survive in the era of global capitalism, leaving understudied the question of whether cities in the Rust Belt can adopt the new economic roles assigned to new growth regions or forge new economic roles of their own.

In this dissertation I address this question by answering the following: What are the different economic trajectories Rust Belt cities have taken over the course of economic restructuring from 1970 to 2000? The analysis shows that deindustrialization followed by complete socio-economic collapse is not the only outcome of restructuring for Rust Belt cities. Rather, cities struggle to find a new economic niche. In this dissertation I provide an elaborate description of the results of this struggle. I highlight the local economic changes in Rust Belt cities that have survived the turbulent period of global economic restructuring as well as the economic changes in cities that have

collapsed, as commonly expected, with factory loss. By highlighting these different economic trajectories I show that under the umbrella of broad, global, economic change, important local transformations are left unexamined, leaving a void in our understanding of how cities grow and develop.

The remainder of this introductory chapter consists of three parts. In the first part, I provide a thorough review of the scholarly literature relevant to this research. The theme that connects all of the literature presented in this section is uneven development. In other words, cities and regions grow at the expense of other cities and regions. This is another reason the urban transformations of concern to this dissertation remain understudied. Uneven development is a longstanding belief embedded in theoretical understandings of how urban areas grow and it is highlighted in the descriptive research on the structure of the global economy. I question whether uneven development is a basic outcome of economic restructuring by showing instances of local economic adjustment and by describing what these adjustments look like in older cities that should have decayed in the new era of global capitalism. In the second section of this introductory chapter I outline the methodological strategy employed to identify these cities and their economic reorganization. Finally, I provide a chapter outline that states the central question of each chapter and I provide a very brief description of how these questions are answered.

Relevant Literature

There is no unified body of scholarly work recognized as "economic restructuring" literature. Therefore, in this review I draw from multiple disciplines to

demonstrate how cities are tied to historical processes of capitalist accumulation and to describe the structure of global capitalism. First, I review political economy perspectives from geography, sociology, and political science that link urban growth to changes in capitalism. I also provide a very brief treatment of regulation theory, which offers answers for why capitalism persists, and in doing so, highlights how different urban forms develop around certain regulatory mechanisms. Together the scholarly work in political economy and regulation theory show that breaks with the past have been a regular occurrence in the history of capitalism and that each break comes with spatial implications, mainly uneven urban development. Second, I review literature from geography and sociology that has an explicit focus on the current historical break and on outlining the structure of the new global economy. In this section, I detail how the structure of industries has changed and highlight economic roles cities can occupy in the era of global capitalism. These literatures also assume new industrial formations and new economic roles only emerge in newly developing regions and cities. Thus, the emphasis on uneven development is maintained. This dissertation questions the necessity of uneven development by exploring how cities within a distressed region experienced global economic restructuring differently. In the final part of this review I present different perspectives on urban growth from sociology and urban planning that may be useful for analyzing how cities may be able to adapt to economic crises.

Historical Breaks in Capitalism and the Growth of Cities:

Political economy has become the dominant theoretical paradigm in the social sciences for examining processes of urban growth and change. This theoretical

orientation situates urban development in the historical unfolding of the capitalist system wherein moments of crises are followed by periods of reorganization. Within each critical juncture the strategic relations within capitalism are altered (i.e., capital-labor, capital-state, and capital-capital). The outcomes of these alterations are new phases of capitalist accumulation (types of capitalism) and new urban environments built specifically to support increased production and consumption. While scholarly work in the political economy tradition has produced important theoretical understandings of the growth of cities, these theories do not adequately address the ability of cities to survive or rebound from crises. Instead, the growth of cities is portrayed as a process of uneven development, where certain cities or parts of cities die at the expense of others.

For example, David Harvey (1985a, 1985b) was one of the first to articulate a political economy perspective on the growth of cities. Harvey argues "capitalist society must of necessity create a physical landscape…in its own image, broadly appropriate to the purposes of production and reproduction" (1985a: 36). Thus, the city is simply a set of interconnected facilities and services built with the intention of correcting periodic crises in the capitalist system. How the "built environment" changes is contingent upon the interplay between class struggles and investment flows through different "circuits" of capital. In an application of his theory, Harvey shows how the development of suburbs arise from a surplus of capital and labor, which leads to investment in the built environment in the form of new real estate projects (1985a). Importantly though, Harvey notes that investments in the built environment are only temporary fixes for furthering capitalist accumulation. Fixed investments eventually become an obstacle to further

accumulation and must be destroyed to create new room for capitalist expansion. The continual process of building and destroying the urban environment results in uneven development, where urban decay in one city or region is replaced by growth in a new city or region.

Gordon (1978) also links urban forms to the historical development of capitalism. Gordon identifies three stages of capitalist development with three corresponding stages of urban growth. In the first stage, the commercial stage, cities developed around ports, but with the development of the factory system and the industrialization process new cities formed in the Midwest and Northeast regions of the United States. The form of the industrial city differed significantly from that of the commercial city. In particular, social classes, which had been closely integrated in the commercial city, were segregated in the industrial city. Working class neighborhoods developed around the factories while capital lived at a greater distance. Further segregation by race defined the residential layout of the new urban areas. More importantly, conflicts between capital and labor were altered. In the commercial city, conflicts focused on trade restrictions and customs, while the new cities were defined by conflicts over the organization of labor and strikes. Gordon recognizes these new conflicts and how capital searches for ideal labor conditions as the motor for change for both capitalism and the city. The third phase of capitalist development is marked by the intentional move of production facilities away from organized labor. Thus, factories shifted to the suburbs, and later, to more labor friendly regions. This era of capitalism was defined by the development of the corporate city in which corporate offices clustered in downtowns to coordinate and monitor

increasingly decentralized systems of production. Additionally, the class and race divisions characteristic of the industrial city were extended into a city-suburb divide.

Mollenkopf (1976, 1983) agrees with the three phases of capitalist and urban development outlined by Gordon, but rather than focusing on how the capital-labor relationship has been the driving force behind the evolutionary pattern, he emphasizes how politics has shaped urban areas. Mollenkopf argues that the industrial city is a product of political machines that were able to pacify labor, especially immigrant workers, and direct city money into large scale development products, such as highway construction, that served the needs of developing industries. Interestingly, these same political machines would spur the deterioration of the industrial city and the rise of the corporate city. Businessmen started to abandon the industrial city over dissatisfaction with the rising costs of dealing with pro-growth urban politicians. Capital sought refuge in suburbs and became advocates of government reform.

Hill (1977) offers a final noteworthy account of urban growth in the political economy tradition that actually begins to map the structure of the global economy. Hill connects the development of the industrial city to the availability of vital resources, such as coal and transportation networks, but then recognizes business growth as the mechanism that transforms the industrial city and creates the modern metropolis. Hill claims the pressures of capitalist competition force businesses to expand into global corporations. How these global corporations organize their numerous production and administrative facilities leads to the formation of urban networks at the local, regional, national and international levels. Hill attempts to outline these networks and shows how

corporate headquarters locate in large national or international cities, administrative centers locate in regional cities, and production is located in smaller cities. The urban hierarchy that Hill describes shifts according to the priorities of capital accumulation, leading to uneven development.

While political economists focus specifically on the growth of the city in relation to the historical development of capitalism, regulation theorists, such as Aglietta (1979) and Lipietz (1986), do so indirectly through the pursuit of answers to a different question: why does capitalism persist? They argue that capitalism's survival relies on the creation of regulatory mechanisms that help the system recreate itself out of times of crises. These "modes of regulation" consist of sets of connected norms, laws, and institutions that support different "regimes of accumulation." While regulation theorists focus on how regimes of accumulation and modes of regulation come together, they also highlight how such consolidations impact the shape of the urban environment. For instance, the post-World War II glory years were defined by a Fordist regime of accumulation wherein large businesses organized the labor process according to Taylorist principles to maximize productivity. The corresponding mode of regulation was mass consumption supported by Keynsian economics and the welfare state (Goodwin, Duncan and Halford 1993). This combination produced the Fordist city with high concentrations of mass production factories and specialized labor (i.e., the industrial city). Regulation theorists contend the Fordist regime fell into crisis under the threat of foreign competition, which demanded a reorganization of production into more flexible forms. The corresponding mode of regulation consists of specialized consumption and local states that promote

competition through privatization and the dismantling of the welfare state. The impact on urban form is the deterioration of the Fordist city (deindustrialization) and the rise of regions of urban "agglomerations" that are tied together through networks of producers and suppliers and specialized cities that perform differentiated economic roles (Storper and Scott 1986). Again, this transition is uneven.

The literature reviewed above is only a small sample of the extensive scholarly work in the political economy and regulation theory traditions. Yet, it effectively demonstrates the strength of these two theoretical paradigms. They provide historical explanations for how capitalism evolves and alters physical space, especially cities. The mechanisms that enable capitalism to adjust to crises, and thereby alter the city, vary for different theorists, but they all agree on uneven development. Some cities will grow and occupy an economic niche in new forms of capitalism while others will deteriorate and die. The theorists reviewed above also describe what uneven development looks like in the era of global capitalism. Gordon's description of the "corporate city" and Hill's rudimentary outline of the urban hierarchy indicate certain cities serve the function of administrative command posts for decentralized production networks. All of the theorists above highlight how production continues to spread outwards from old cities and into the suburbs and new regions, while regulation theorists posit the existence of new agglomeration economies of small manufacturers in certain regions. Regulation theorists also recognize that new cities will develop to serve certain specialized functions in the era of global capitalism. Finally, the old industrial cities decay. The literature reviewed

below examines these changes in greater detail, beginning with the new urban command centers.

The Structure of the Global Economy:

"Global cities" top the urban hierarchy in the new global economy. The decentralization of production in combination with advances in telecommunications should have allowed for a more even dispersal of economic functions across the globe. This has not happened. Scholars of global cities argue this is because broader production networks require intense management and central control. Thus, these activities, as well as corporate headquarters, have been concentrated in a few great cities. (Friedmann 1986; Friedmann & Wolf 1982). Sassen (1991) provides more detail on what these activities are. She argues that the production of management, legal, financial, accounting, and consulting services exceed the production of manufactured goods in importance. Thus, they are the new "products" of today's economy. According to Sassen, the leading and most innovative producers of these products are highly concentrated in New York, London, and Tokyo. Therefore, these cities serve as the central marketplaces in today's international economy. They are the geographic command points within which the activities or products necessary for the power of large corporations and banks are manufactured, marketed, and sold.

On a level below global cities, there are also national and regional cities that operate as command posts in the new economy. Friedland and Palmer (1984) argue that successful cities in the global economy are corporate headquarters cities. They note "the growth of locales depends on the fortunes of their firms," as corporate headquarters

supply banks, and different service providers with business (406-407). Hence, corporate headquarters are key resources in the new economy that determine which cities have grown with the rise of the global economy.

Outside of the command centers manufacturing still exists in urban areas. While many factories have moved overseas, some have not migrated as far, relocating in the more labor friendly Southern and Sunbelt regions of the U.S. Additionally, some cities have lured foreign transplants (Perrucci 1994). Thus, despite the demise of the industrial city in the United States, some cities have maintained the role of heavy manufacturer in the global economy. However, not only has manufacturing changed location, but it has also changed in form.

As political economists tracked how changes in types of capitalism shaped the urban environment, economic geographers have described how different variants of capitalism alter the organization of production (Scott 1988; Massey 1984). Under monopoly capitalism, manufacturing took place in large factories where the labor process was broken into specialized tasks and substantial shares of industrial output were produced. In the current era of global capitalism, large factories have been supplanted by "flexible specialization" (Piore and Sabel 1984).

Flexibly specialized manufacturing consists of small, innovative companies that continually vary their products and constantly seek to improve product quality. They depend on "general purpose technologies and a highly skilled work-force to cut production costs," respond quickly to changes in market conditions, and reduce the time it takes to perform tasks (Sabel 1989: 17). In addition, flexibly specialized manufacturers

hold unique relationships with their suppliers and customers that are based on cooperation and trust. This does not mean that competition has been cut out of economic activities. In fact, competition is intense, but it is not based on price. Instead, competition is driven by innovation and the pursuit of superior product quality. Interestingly, cooperation and competition complement rather than contradict one another in this form of production (see also, Powell 1990; Best 1990; Sabel 1989; and Sabel & Zeitlin 1985).

The three main advantages of flexible specialization are product innovation, speed of production, and increased product quality. It is believed that these are absolutely necessary for business organizations to survive in the current economic climate of volatile, competitive, global markets. How this system of production provides these advantages rests mostly in the benefits of networks between producers, suppliers, and consumers. This is the feature of flexible specialization that has received the bulk of scholarly attention.[1]

Flexible specialization is a form of production that has taken root in "new industrial spaces" (Scott 1988; see also Markusen 1985).[2] However, certain resources

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[1] Because the advantages of flexible specialization and how this form of production creates such advantages is such a broad portion of this literature, it cannot be given adequate attention here. Insight into flexible specialization and innovation is provided in Saxenian 1994, Howells 1992, and Wells and Cooke 1991. The advantages of speed are documented in Uzzi 1997, 1996; Helper 1990; and Powell 1990. Saxenian 1994, Best 1989, Lorenz 1989, and Zeitlin and Totterdill 1989 provide excellent examples of how this form of production improves product quality.

[2] It also takes different forms. There is an extensive geography literature on the spatial organization of flexible specialization not reviewed here, which includes the work on "cluster economies" by Porter 1990, Bianchi & Belini 1990 and Krugman 1991, as well as the work on "industrial districts" by Storper and Harrison 1991.

within these spaces may have been necessary for this form of manufacturing to develop. Young, Francis, and Young (1994) show flexibly specialized manufacturers arose where larger employers served as the primary consumer of their products. Additionally, this form of production has been linked to the development of new high-tech products, and therefore, large research universities have been recognized as facilitators of its growth in newly emerging cities and regions. Saxenian (1994) shows this to be the case with Stanford University and the rise of Silicon Valley.

The shifting location and forms of manufacturing relates to research on the international division of labor (IDOL) between cities (Glickman 1987; Frobel, Heinrichs, and Kreye 1977). This literature largely focuses on how heavy manufacturing has relocated to other countries, but it also outlines new, specialized economic roles cities can occupy in the global economy. Researchers of the new IDOL indicate that even though heavy manufacturing continually moves abroad, research and development facilities often stay within the country. Thus, some cities have developed as knowledge-based or high-tech centers. Some of these cities are the flexibly specialized, university-based, light manufacturers described above, but not always. Research on the new IDOL has focused on the rise of cities like Houston and Los Angeles, where the federal government played a significant role in their growth, especially through the development of vibrant aerospace and military industries (Hill & Feagin 1987; Soja, Morales and Wolff 1983).

Finally, some cities have emerged as new urban playgrounds. In the new global economy, where services have become the new products, tourism is a specialized niche some cities have occupied. For example, Orlando and Anaheim represent cities as

"theme parks" where the economy is based on consumption (Dear and Flusty 1998). Additionally, other cities in Florida and Arizona have developed as retirement centers. They have built specific kinds of neighborhoods and developed certain amenities retirees find attractive (Logan and Molotch 1987).

While the growing cities in the global economy will occupy one of the economic niches described above, older cities are supposed to decay. These are the cities that have been left behind in the process of restructuring. The scholarly work that concentrates on these decaying cities centers on describing deindustrialization, mainly the extent of it and its numerous negative impacts.

Bluestone and Harrison (1982) provided the seminal book on the decline of manufacturing in America's industrial regions and cities. They highlighted the extent of America's deindustrialization problem by tracking employment creation and destruction in the private sector from 1969 to 1976. They noted plant shutdowns eliminated a total of 22 million jobs in the United States with the brunt of the losses concentrated in the Northeast region of the United States. Staudohar and Brown (1987) also detail the 1970s and early 1980s wave of plant closures and describe the creation of the Rust Belt. Crandall (1993) documents the intense wave of deindustrialization that swept through the Midwest in the 1980s. By the 1990s, the widespread job loss in industrial cities across the Rust Belt was common knowledge. Announcements of plant closings covered the pages of local newspapers throughout the Rust Belt and cities such as Youngstown, Ohio; Flint, Michigan; and Buffalo, New York, became icons of industrial collapse.

While the extent of the job losses in manufacturing is striking, the various effects of these losses are particularly disturbing. Bluestone and Harrison (1982) argued the loss of a factory started a negative chain reaction in industrial cities. First, jobs in other sectors of the local economy disappeared soon after those in manufacturing. This increased unemployment rates, and made it increasingly difficult for workers to find new employment. Dislocated workers went extended amounts of time unable to replace their old jobs. This translated into losses in income and wealth. Those that could leave to find work elsewhere did so, causing the population of industrial cities to plummet. Thus, the tax base shrunk in industrial cities while the need for social expenditures increased. This led to an increase in income and property taxes, which provided even more incentive for residents to leave. With employers and workers leaving, the physical landscape of industrial cities became one of vacant, run-down buildings and homes. Bluestone and Harrison argued that those who stayed in these crumbling urban areas experienced deteriorating mental and physical health. They also asserted a sense of community anomie pervaded cities that had fallen victim to deindustrialization.

There is a substantial amount of research that focuses on these "ripple effects." Some of the research does not have a specific urban component. For instance, there are many studies on how deindustrialization has impacted former factory workers and the American labor movement (Moody 1997; Milkman 1997). The research that does have an urban focus often describes the process of decline in-depth in different Rust Belt cities (see Dananeau 1996; Papas 1989; Bensman and Lynch 1988; Goldman 1983; Lynd 1982). Other urban studies have focused on particular effects of manufacturing loss in

greater detail. In particular, there is a considerable body of research on how deindustrialization has contributed to rising inequality and the erosion of the middle class in urban areas (Harrison and Bluestone 1988; Sheets, Nord and Phelps 1987; Nelson and Lawrence 1985). There is also substantial amount of research on how deindustrialization flattened the organizational life of cities (Wilson 1994; Bruno 1999; Rae 2003) and created spatial divides between workers and new job opportunities (Kasarda 1988; Wilson 1994). Finally, there is a wealth of scholarly work on how the changing economy, specifically the loss of manufacturing, has impacted racial and ethnic minorities in urban areas (Sugrue 1999; Wilson 1990; Freeman and Holzer 1986; Petersen 1985).

In sum, the literature reviewed in this section details the structure of the current global economy. Cities that are thriving in the era of global capitalism occupy a variety of economic roles. They are command centers at the global, national, or regional level with highly developed producer service economies. They are also heavy manufacturers that have lured factories from other cities or from other countries. Some are flexibly specialized manufacturers that produce innovative, high tech products, and others have managed to do the same through the development of military-based manufacturing economies. Finally, some have become spaces for consumption that rely on tourism to succeed in the new service-based global economy. Outside of these growing cities are the cities that have been left behind in the process of economic restructuring. These decaying cities are the victims of inevitable uneven development. They are characterized

by deindustrialization and the host of negative socio-economic impacts that accompany massive job loss due to factory shutdowns.

Adapting to the Global Economy?

Uneven development has been reinforced as a basic outcome of economic restructuring by the handful of studies that have shown how cities and communities have been ineffective in resisting the effects of structural changes to the economy. These studies typically focus on how weakened labor unions have been unable to mount effective responses to industrial decline (see Bruno 1999; Camp 1995; Fuechtmann 1989; Lynd 1982), or on how local and state-level policies have largely failed to preserve or revive old cities (see Logan and Swanstrom 1990; Ross and Trachte 1990; Dyson and Wilkes 1983). Yet, the assumption that old cities and regions cannot adapt to the global economy is not uncontroversial.

Markusen (1980) argues that there is no reason why the expansion of capitalism precludes the destruction of old areas in favor of the new. Additionally, a couple of studies have compared cities that collapsed after economic restructuring to cities that should have died but found ways to adapt and survive. Savitch and Kantor (2002) follow the transformation of Detroit and Glasgow over the course of global economic restructuring. Both of these cities had deep manufacturing histories, but Glasgow has emerged as a successful city in the new economy, while Detroit continues to suffer. They explain the differences between these two cities through public-private partnerships and local culture. Similarly, Safford (2004) recognizes Allentown, Pennsylvania, as a thriving city in today's global economy while Youngstown, Ohio, a similar city in

regards to its industrial past, continues to struggle. He accounts for this difference in the network structures between local economic, political, and community leaders. These studies show there is variation in urban outcomes that are not permitted or recognized in the theoretical literature on the growth of cities or in the descriptive literature that outlines the structure of the global economy.

While the main goal of this dissertation is to identify and describe this variation in greater detail for cities in a particularly depressed region, why it exists is an important question that deserves attention. An ecological approach to explaining this variation would argue some cities are able to avert the negative consequences of economic restructuring better than others because they possess the right combination of resources that make them amenable to new employers, such as efficient access to transportation networks (Hawley 1981). Some of the resources that can help cities occupy new economic niches in the global economy were identified in the literature reviewed above on the structure of the global economy. For instance, the presence of large manufacturers and universities play an important role in the development of flexibly specialized manufacturing and in the formation of local economies based on high-tech production and research. Corporate headquarters drive the development of producer services. The efficient access to transportation networks has also been linked to the growth of these services, and they are likely to be important resources for developing tourist-based economies (Abrahamson and Dubick 1977). Cities that contain these resources may be able to adjust rather than crumble under the impacts of economic restructuring. However, simply having certain resources does not necessarily mean cities will be able to

adapt to the global economy. These resources still need to be recognized and incorporated into growth plans for cities attempting to adjust to economic distress. A city's ability to do this is likely to depend on local politics.

The "growth machine" perspective developed by Logan and Molotch is the most prominent theory connecting local politics to urban growth (Logan and Molotch 1987; Molotch 1976). Logan and Molotch recognize that there are certain businesses and organizations within cities that are not particularly mobile, and therefore, they depend on the continual growth of the city for their livelihood. For example, utility companies and newspaper publishers are always interested in maintaining urban growth. These actors organize into local growth coalitions and become very active in local politics in order to shape growth plans that continually serve their interests. According to Logan and Molotch, the growth plans rarely, if ever, match the needs and desires of local communities. This is because local communities derive use value from land within the city, while the members of growth coalitions are always interested in land for its exchange value. As a result, the growth of cities is a contested process in which growth coalitions continually formulate plans to develop urban properties in ways that best satisfy their need for continual profit while communities organize to resist these plans in hopes of preserving the use value they obtain from land.

While Logan and Molotch identify the key actors in the urban growth machine they do not devote attention to other political relationships these actors may have or to how these relationships may impact their positions on growth. Ratcliff's research on St. Louis takes these issues into consideration. Ratcliff (1980) showed how local banks, who

should be important players in promoting growth, formed relationships with national corporations, local businesses and local community groups at different times (see also Ratcliff, Gallager, and Ratcliff 1979). As a result of these ties, banks took contradictory positions on growth over the course of the city's development. They promoted local growth, contested growth plans that detracted from the "livability" of the city, and also made economic decisions that led to disinvestment in the city. Ratcliff's findings question the growth machine thesis by showing there are some instances when members of the growth machine do not promote growth and even take the side of communities favoring use values.

Geographers and urban planners have raised further questions about the growth machine thesis in their formulations of urban regime theory. In urban regime theory, growth coalitions are recognized as only one of many groups that can organize and exercise local power in politics. A regime crystallizes when certain coalitions that follow a particular model of politics exercise power over a city for an extended period of time (see Elkin 1987; Stone and Sanders 1987; Fainstein and Fainstein 1983). By developing typologies of urban regimes and connecting them to development outcomes, urban regime theorists have shown urban growth coalitions do not always exercise political power. If they do, they do not always promote local growth and sometimes they even work against it. There are however, growth regimes. Not surprisingly, the business elite in cities play an important role in these regimes, but more importantly, they do not always promote growth at the expense of the community. Stone (1989) showed that the local business elite could ally with community interests and promote "positive" politics.

Essentially, he suggests there is room for cooperation in the formulation of growth policy, and therefore, capital need not exercise social control, as implicit in the growth machine perspective. Instead, it can be a player in "social production," using its resources to promote effective local government.

All of these studies suggest local politics are important to urban growth, but who influences development, and how, happens in complicated ways. More recent research that tries to clarify this process synthesizes theories of local politics with the theories reviewed earlier on structural changes to capitalism. For example, in an edited volume by Lauria various scholars have tried to combine insights from urban regime theory with concepts from regulation theory to better explain how cities have changed in the era of global capitalism (1997). This may be a fruitful approach for understanding why some cities in the Rust Belt have taken different trajectories over the course of economic restructuring.

However, before such an approach can be followed it is necessary to identify and describe these different economic trajectories. This dissertation systematically analyzes the trajectories of Rust Belt cities and provides a more comprehensive description of the structure of the global economy. By questioning uneven development as a basic outcome of economic restructuring, it sets the stage for the reworking of theories on urban growth.

Methodolology

The Rust Belt cities I examined are in the states of Michigan, Illinois, Indiana, Ohio, Pennsylvania, New York, Connecticut and Massachusetts. I focused only on these states because they were the states most deeply integrated into the vulnerable metals-

based industries that collapsed from 1970 to 2000. These industries include the manufacturing of primary metals, fabricated metals, machinery, electronics, and of course, transportation equipment. I also limited my focus to smaller cities in these states. The major metropolitan areas of Detroit, Chicago, Cleveland, Pittsburgh, Philadelphia, New York and Boston are excluded from the study. While these cities certainly struggled with deindustrialization and have their own interesting stories of economic adjustment, it is the medium-sized and smaller cities in the region that primarily serve as examples of economic collapse. Consistent, longitudinal data were not available for four cities. These cities were excluded from the study. Otherwise, my only inclusion criterion was all cities had a population greater than 100,000 in 1970, the starting point of economic restructuring. A total of 69 cities met this criterion.

I divided these cities into seven different groups based on their size, percent of part-time and full-time employment concentrated in manufacturing, and percent of manufacturing employment concentrated in the vulnerable metals based industries. The purpose of this step in the research is to isolate cities of a certain kind—medium-sized cities that had strong manufacturing histories in the vulnerable metals. As icons of deindustrialization, variation in how these cities experienced the period of global economic restructuring were of particular interest. The data I used to divide these groups were obtained from the U.S. Department of Commerce, Bureau of Economic Administration's (BEA) Regional Economic Accounts and from the Department of Housing and Urban Development's (HUD) State of the Cities Data System. I followed a fuzzy set approach to classify the cities, which is described in full in the next chapter.

I also parceled the cities into three different performance categories: stable, struggling, and devastated cities. These distinctions were made by comparing how cities performed on a quality of life index over the course of global economic restructuring from 1970 to 2000. The quality of life index consisted of seven different socio-economic indicators: percent change in total population, vacant homes as a percent of all housing units, poverty rate, percent of families in the national income bracket, median household owner's value, unemployment rate, and per capita income. Cities were ranked according to their change scores for preliminary designations into performance categories. Then, all cities were compared to one another one by one, taking starting point in 1970, change, and end points in 2000 on each indicator into consideration. This step served as a check on the initial classifications that only considered change scores.

After these two steps, all 69 cities were parceled into seven different types of comparable cities and into three different performance categories. The next step was to uncover how the local economies of these cities changed over the course of economic restructuring. To accomplish this, I constructed a dataset on sector-level employment change. These data were obtained from the U.S. Department of Commerce, Bureau of Economic Administration's (BEA) Regional Economic Accounts and from the Department of Housing and Urban Development's (HUD) State of the Cities Data System. The HUD data were especially useful because the service sector was split into three categories, which allowed for a more thorough analysis of service employment change.

I first analyzed these data using conventional quantitative methods to determine the sector-level employment changes from 1970 to 2000 that distinguish the stable, struggling, and devastated cities. This step of the research provided a general story about economic restructuring for all of the cities in the Rust Belt region. Since it was not possible to determine the specific economic roles cities have taken through the analysis of sector-level data, the quantitative analysis was supplemented with descriptive data on employment change in the services. These data were acquired from *Site Selection Handbook*, a business publication that is published annually and lists new business formations at the state and metropolitan statistical area level.

Next, I selected three groups of comparable cities and analyzed their employment changes separately. I did this to provide a more thorough account of the different economic trajectories cities in the Rust Belt have taken than that provided by the quantitative analysis. I utilized fuzzy set qualitative comparative analysis to accomplish this (Ragin 2000). This is an innovative method that is particularly useful for analyzing small-n datasets and for examining how factors combine to produce outcomes. I used this method to examine how sector-level employment change trends combined in the stable and devastated cities. From these combinations of employment trends I develop descriptions of more specific paths cities may have taken over the course of economic restructuring.

Finally, I employed a case-study approach to examine how two stable and two devastated cities reorganized their local economies in response to industrial decline. This step provides rich, detailed stories of how specific cities have managed, or failed to

manage, industrial crisis and form new economic identities in the post-industrial global economy. The cases selected for in-depth analysis were the best examples of medium-sized cities with deep histories in the manufacturing of vulnerable metals-based products, as determined earlier when cities were parceled into different types. A stable and a devastated city were chosen from the same state (a stable and a devastated city in Michigan and a stable and a devastated city in Ohio). This was done to limit state-level factors that may have impacted city performance and economic change. I gathered data from a variety of sources on the cases, including: the business pages from the Sunday edition of local newspapers from 1970 to 2000, local business journals published by the local chambers of commerce within each city, numerous newspaper and magazine clippings stored in clippings filed at the local public libraries in each city, directories of local employers, and secondary sources that detailed the local histories of each case. In addition to these archival materials, thirty interviews were conducted with city government officials, leaders of economic development organizations, local business owners, members of the local press, and community leaders. The data from all of these sources were combined to reconstruct the economic histories of each case from 1970 to 2000, highlighting the specific roles they occupy in the new global economy.

On the whole, I provide three different analyses of the economic trajectories Rust Belt cities have taken from 1970 t0 2000: an analysis of economic change in all Rust Belt cities in general, an analysis of the trajectories taken by three different types of stable and devastated cities, and finally, in-depth analysis of the economic changes in two stable and two devastated Rust Belt cities.

Chapter Outline

I begin in Chapter 2 by answering two questions. First, what are the different types of cities in the Rust Belt? Existing research on deindustrialization focuses on a particular type of city to highlight the negative impacts of factory loss: the medium-sized, manufacturing city with a history of production in the metals-based industries. The experiences of these particular cities have been generalized to the entirety of the urban Rust Belt. However, not all cities in the Rust Belt are of this type, and as a result, how cities in this region have experienced global economic restructuring may vary in important ways that have not been recognized in previous research on deindustrialization. I develop a composite portrait of the different types of cities in the Rust Belt in order to develop a more comprehensive account of how economic restructuring has been experienced by cities in the region than previously offered. Second, how has he quality of life changed in Rust Belt cities over the period of global economic restructuring? By answering this question I determine if all cities have collapsed in this distressed region, as assumed by theories of urban growth that recognize uneven development as an essential outcome of restructuring, or if cities have been able to avoid the downward socio-economic spiral associated with deindustrialization. I show that some cities have remained stable throughout the process of economic restructuring, while some cities have been devastated. This is an important finding. It calls the inevitability of uneven development into question and suggests current descriptions of the structure of the global economy may be incomplete. Cities in the Rust Belt may be able to occupy some of the economic roles that have been recognized only in new cities and new growth regions, or

they may have forged entirely new economic roles that have allowed them to resist decline. This is explored in the following chapters.

The main question of Chapter 3 is: how has employment changed in stable, struggling, and devastated cities in the Rust Belt region over the course of economic restructuring? The theories on urban growth and the descriptive literature on the structure of the global economy suggest the extent to which cities experienced deindustrialization should separate the stable, struggling and devastated cities. Additionally, there should be no indications that the cities in this region have been able to reorganize their local economies to adapt to economic restructuring. After all, it is in new regions that cities grow and perform new economic roles. The analysis in this chapter shows this is not the case. It identifies types of employment change, other than manufacturing loss, that better characterize the stable, struggling and devastated cities. In doing so, this chapter suggests the Rust Belt cities have reorganized their local economies, but it is unable to identify the specific economic roles these cities now occupy.

In Chapter 4, I work towards clarifying the new economic roles different cities in the Rust Belt region occupy. The main question of this chapter is: how have certain types of stable and devastated cities in the Rust Belt region reorganized their local economies to forge a new economic identity? In this chapter, I am specifically interested in whether or not cities have been able to occupy any of the new economic roles identified in the descriptive literature on the structure of the global economy (producer services, flexible specialization, tourism, etc.). According to this literature, and the theoretical literature on

urban growth, new cities should occupy these roles at the expense of the urban Rust Belt. This chapter shows that the urban Rust Belt has not been flattened by global economic restructuring, as different types of cities have taken various different paths during this time period. Thus, there are changes within distressed regions that have been unaccounted for by current theories of urban growth and descriptions of the global economy.

In Chapter 5 and Chapter 6 I begin to analyze the case-studies. The question that organizes both of these chapters is: how have specific stable and devastated cities reorganized their local economies over the course of economic restructuring to find a new economic niche in the era of global capitalism? The reorganization of manufacturing employment is examined in Chapter 5, and changes in service-based employment are explored in Chapter 6. The stable and devastated cities take very different economic paths, which are not accounted for by losses in manufacturing employment alone. Rather, manufacturing has changed in subtle ways, influencing different types of service growth in these cities and leading to the development of two very different economic roles. These findings contribute to the literature that examines the impacts of manufacturing loss by showing how deindustrialization unfolds can constrain the options cities have for reorganizing their local economies. The detailed description of this process in these chapters also serves as an important starting point for refining theories on urban growth that do not recognize economic transformation in old cities and regions.

In the conclusion, I briefly summarize the results of each chapter. I then discuss the limitations of this dissertation and where future research should be directed.

CHAPTER 2: A CLASSIFICATION SYSTEM FOR ANALYZING THE RUST BELT CITIES

The existing research that explicitly focuses on deindustrialization in the United States primarily takes two forms. The first form consists of regional studies that highlight the extent of manufacturing loss in the East North Central, Middle Atlantic, and New England states (e.g., High 2003, Crandall 1993, Bluestone and Harrison 1982). These studies refer to the experiences of cities only to provide poignant examples of the severity of regional decline. Examples of Rust Belt cities in these studies range from major metropolises, such as Cleveland and Pittsburgh, to small, one-factory towns, such as Fall River, Massachusetts (Bluestone and Harrison 1982). The bulk of the research on deindustrialization takes the second form, which consists of case studies of specific cities or factories that document the impacts of job loss on the community (e.g., Cowie and Heathcott 2003, Bamerger and Davidson 1998, Bensman and Lynch 1988). These studies tend not to examine the major metropolises or the smaller manufacturing-based towns, but rather a particular type of city that emerged as an industrial giant after World War II, such as Buffalo, New York (Goldman 1983); Flint, Michigan (Dandaneau 1996); or Youngstown, Ohio (Pappas 1989, Lynd 1982).

While all of the cities mentioned above are referred to as, "Rust Belt cities," important variation exists between them that should be recognized in cross-case studies. Yet, in the very few examples of comparative research on deindustrialization this variation is not recognized. A Rust Belt city is defined as any city in the Great Lakes or New England states. With this general definition, the common tie to a distressed region

is the basis upon which cities are selected for study. For instance, in his research on how globalization affects communities in Upstate New York, Thomas (2003) notes his three cases (Utica, Hartwick, and Cooperstown) all differ in size and history, but are appropriate comparisons in that they share a location in a region that is struggling to adapt to the global economy. Similarly, Safford (2004), in his study of interorganizational networks in deindustrialized cities, draws his cases from a population of Rust Belt cities defined as "cities with populations of less than 10 million residents in the eight states bordering the Great Lakes" (8). To Safford's credit he does compare demographic statistics for his cases (Youngstown, Ohio, and Allentown, Pennsylvania) to ensure the selection of more comparable cities than Thomas. Yet within his broad definition of the population of Rust Belt cities there is considerable and unrecognized variation between cities that may have influenced why Youngstown and Allentown emerged as optimal cases for study.

My main objective in this chapter is to dissect the broad regional definition for the population of Rust Belt cities to identify possible subgroups of cities that are worthy of separate analytical attention. The case oriented research on deindustrialization suggests a type of city that is unique in the Rust Belt region. These cities can be considered the prototype or "ideal type" Rust Belt city and they are of particular interest to this study (Weber 1949). In this chapter I refine the definition of the population of Rust Belt cities to better identify these cities as well as other subgroups of comparable cities. Additionally, I evaluate how closely cities conform to the more nuanced definition, thereby measuring the degree to which each city belongs in its respective subgroup. In

short, I develop a composite portrait of the different types of cities in the region. This portrait is the first step in creating a classification system for Rust Belt cities.

Another important concern for this research is how well the cities have performed over the period of economic restructuring from 1970 to 2000. There are numerous negative effects associated with plant closures. Thus, my second objective in this chapter is to evaluate the cities within each subgroup to parcel them into categories based on how well they were able to resist these negative effects. To my knowledge, such an evaluation does not currently exist. While we know much about processes of decline in Rust Belt cities, the region's success stories have received little attention. Identifying cities that have performed well or rebounded from losses during the thirty year period of economic restructuring is the second step in creating the classification system used in this study.

To accomplish the first objective, I follow a methodological strategy incorporating the use of fuzzy sets (Ragin 2000). In the first part of this chapter I explain why this approach is taken and provide an overview of the fuzzy set methodology. I also describe how I constructed three fuzzy sets and detail how they were used to isolate seven groups of comparable cities within the Rust Belt region. To accomplish the second objective, I create an index measuring each city's socio-economic performance from 1970 to 2000. To complete the classification system, I then use the index to rank each city into three performance categories: stable, struggling, and devastated.

Finally, the completed classification system is used to draw some preliminary conclusions about how the different types of cities in the Rust Belt experienced the period of economic restructuring.

Using Fuzzy Sets to Define the Population of Study

Fuzzy sets are analytical tools based on the principles of set algebra that are specifically designed to address what Ragin calls the "dual nature" of diversity: "diversity in kind and diversity in degree of membership into categories" (2000: 150-151).[3] In other words, they are capable of identifying the different types of cities unrecognized in the broad definition for the population of Rust Belt cities provided above. Additionally, they measure how well each city fits into each different type. Hence, this is the optimal method for accomplishing the first objective of this chapter: dissecting the general definition of Rust Belt cities into groups of comparable cases.

Using a fuzzy sets approach, diversity in kind (i.e., the variability within populations) is assessed by viewing cases as "configurations" of qualitative characteristics (72-73). In other words, this approach highlights how different values cases have on several important variables may combine to form potentially unique types of cases. Recognizing cases as configurations differentiates fuzzy sets from a conventional variable oriented approach. For instance, Safford (2004) uses a conventional approach to identify Allentown, Pennsylvania, and Youngstown, Ohio, as comparable cases in his study of interorganizational networks in deindustrialized cities. He chooses these cases because they have similar values across a variety of variables,

[3] See Ragin (1987) for a review of set algebra and its use in comparative studies.

including: size, median income, percent employed in manufacturing, and percent graduating from high school. However, these cases differ in the percent employed in steel, with Youngstown having nearly twice the amount of steel workers than Allentown. This difference is glossed over as the cases share more similarities than differences. However, when viewed configurationally, the percent employed in steel may not simply be a trivial quantitative difference but a qualitative one suggesting these cities differ in kind. Therefore, not only are they not ideal comparisons but possibly members of two distinct populations. A difference like this can be mistakenly overlooked, but a configurational understanding of cases stresses the need to identify important variables for which different values combine to form qualitatively different types or populations.

Fuzzy sets also recognize that cases can differ in the degree to which they satisfy qualitative characteristics. For instance, in the example above, Allentown is not a steel city like Youngstown, but it does have some employment concentrated in steel. Thus, it is somewhat of a steel city, or, in Ragin's terms, Allentown has "partial or fuzzy membership into the set" of steel cities (154). Fuzzy sets capture this form of diversity by scaling membership into a set. In other words, they measure how well a case conforms to qualitative characteristics. In "crisp sets," which simply identify categorical distinctions, a Boolean value of "1" denotes full membership into a qualitative category and a Boolean value of "0," denotes full non-membership (6). Fuzzy sets however, retain these values but also allow for the scaling of scores between them to allow for partial membership into categories. Scores closer to 1 indicate stronger membership into a category. A score of .5 is the value at which it is uncertain as to whether a case is more

in or more out of a category and scores closer to 0 indicate weaker membership (154). Scaling allows for assessments of how good of an example a case is of a certain type. Additionally, scaling allows for an assessment of how comparable certain cases are within a particular type.

In this research I am primarily concerned with the particular type of city prominent in the case-oriented research on deindustrialization. These cities developed near rivers and canals, taking advantage of waterpower to develop a manufacturing infrastructure and becoming major manufacturing centers with the help of World War II and defense related production. They never rose in commercial or cultural prominence to contend for major metropolitan status but became the primary manufacturing hubs in the region (Teaford 1993). Hence, they were not small in population but rather large. Employment in these cities was heavily concentrated in the metals-based industries, which include: primary metals, fabricated metals, electronics, machinery, and transportation equipment. These industries suffered a massive collapse in the Rust Belt region from 1970 to 2000, leaving these cities very vulnerable to economic decline (Crandall 1993, Rae 1984). Finally, the cities of concern may have developed near the major metropolises but are not satellites. They maintained their own unique manufacturing-based identities, which were cultivated by the working class urban geography that developed around the major production facilities to which they were home (Rae 2003, Bruno 1999).

To define the population of these cities using a fuzzy sets approach, I first identified the qualitative characteristics that set them apart from other cities in the region. From the description above, Rust Belt cities are characterized by a unique population size, manufacturing identity, and deep integration into the metals-based industries. These were the qualitative characteristics on which I chose to focus. The variables I used to operationalize these differences were total population, percent of full-time and part-time employment in manufacturing, and percent of manufacturing employment concentrated in metals (Standard Industrial Classification codes 33 through 37). Data on population and employment in manufacturing were obtained from the U.S. Department of Commerce, Bureau of Economic Analysis. Data on manufacturing employment in vulnerable industries were obtained from the U.S. Census Bureau, Economic Census.

To create a fuzzy set, the range of values defining a city's complete membership into the set must be specified. Additionally, the ranges of values denoting partial membership must be established. The level of detail for a fuzzy set varies. For example, a typical five value fuzzy set is composed of ranges of values that indicate whether a case is fully in, mostly in, ambiguous, mostly out or completely out of the set. However, a fuzzy set can be composed of six, seven, or nine value scales or even be continuous. Regardless of the detail of the scale, breakpoints between the values denoting complete membership and the ranges indicating partial membership cannot be random.[4] Rather, their development relies heavily on the researcher's theoretical and substantive

[4] In the case of continuous fuzzy sets, only the range of values specifying complete membership and complete non-membership need to be defined. The fuzzy scores between full membership and full non-membership are calculated using fs/QCA.

knowledge of the concepts guiding the study, and therefore, explicit reasoning should be provided for them. Using available evidence, case values are then compared to the scale to calibrate a case's fuzzy score for set membership (Ragin 2000: 153-159).

I created three fuzzy sets to define the population of ideal Rust Belt cities. The first fuzzy set is a six value set for "medium-sized" cities.[5] To construct this fuzzy set, I used cities frequently cited or used as case studies in the research on deindustrialization as models for the ideal-type Rust Belt city. Based on the size of these cities, I decided urban areas having a 1970 population between 400,000 and 750,000 people have full membership into the set of "medium sized" cities. Cities larger than this come to resemble the major metropolis more. These larger cities may have once competed for major commercial and cultural dominance in the region but have settled into a middle existence between the major metropolis and the manufacturing hub. Examples include Cincinnati and Indianapolis. Despite these differences, I considered these larger cities more in the set because they share similar manufacturing histories with the ideal Rust Belt cities. They may have diversified their economies more than the ideal Rust Belt cities and invested more in developing an urban culture, but they never could overcome the manufacturing image that was shaped by the major employers in manufacturing they were home to (Cronon 1991). Finally, I decided cities below the ideal size range were more out of the set of medium-sized cities than in. As cities decrease in size from the ideal range, they come to resemble factory towns more than the independent

[5] In this study "medium-size" refers to a qualitative difference in the cities and not the median. Rust Belt cities were fairly large, but still considered "second-tier" or "second-level" cities in size (Teaford 1993).

manufacturing hubs of the region. These cities were often home to branch plants rather than headquarters. Examples include Lansing, Michigan, and Pittsfield, Massachusetts (Fine 2003; Nash 1987). The membership criteria for this fuzzy set is summarized in table 2.1 below.

Table 2.1: The Scale for Fuzzy Membership into the Set of Medium-Sized Cities

Raw Scores of Population Size	Verbal Labels	Fuzzy Membership Scores
≤ 100,000	Fully out	0
100,001 – 250,000	Mostly out	.2
250,001 – 400,000	More or less out	.4
400,001 – 750,000	Fully in	1
750,001 – 900,000	Mostly in	.8
≥ 900,001	More or less in	.6

The second fuzzy set measures the manufacturing identity of a city. To create this fuzzy set I examined the percent of total full-time and part-time employment concentrated in manufacturing in 1970 for cities commonly recognized for their manufacturing identity. The cities that served as models included: Pittsburgh, Pennsylvania; Detroit, Michigan; Cleveland, Ohio; and Buffalo, New York. All of these cities, known for their histories in manufacturing, had around 30 percent of their total full-time and part-time employment concentrated in manufacturing. Of course, these cities were larger than the ones of particular interest, so smaller cities were examined as well. Cities such as New Haven, Connecticut; Youngstown, Ohio; and South Bend and Gary, Indiana, had similar percentages of employment concentrated in manufacturing. Therefore, for the fuzzy set for manufacturing identity I set the standard for full inclusion at 30 percent of full-time and part-time employment concentrated in manufacturing. I

then took the average percent of total full-time and part-time employment in manufacturing for all MSAs in 1970 to set the mid-point. Cities neither in nor out of the set of cities with a manufacturing identity had 20 percent of their employment in manufacturing. The mid-point automatically established the standard for non-membership at 10 percent or less. Unlike the first fuzzy set for medium-size, which had a six value scale for membership, the membership scores in the set of cities with a manufacturing identity were continuous.

The final fuzzy set measures the degree to which a city was integrated into metals-related production in 1970. Cities with a sizeable portion of their manufacturing employment concentrated into the metals-based industries were more likely to experience manufacturing decline. Therefore, this is a fuzzy set for assessing vulnerable cities. I once again used several well known metals-based cities, including Flint, Michigan; South Bend, Indiana; and Youngstown and Toledo, Ohio, as models to determine the standards a city must meet for full membership into the set. While all of these cities are commonly known for their metal-related production, their percent of manufacturing employed in metals varied considerably. Therefore, I used their average percent of manufacturing employment in metals to set the standard for full membership into the set. A city had to have at least 50 percent of their manufacturing employment concentrated in vulnerable industries to be fully in the set. I used cities that had a greater percentage of manufacturing employment in at least two other non-metals industries, such as textiles, chemicals, paper, instruments, lumber, and food products as examples to set the standard for non-membership into the set. These cities had an average of 15 percent of their

manufacturing employment in the metals. This became the cut-off point demarcating non-membership into the set of vulnerable cities. Similar to the fuzzy set for manufacturing identity, the membership scores between full membership and full non-membership were continuous.

Next, I followed the above criteria and assigned set membership scores to the cities in the Rust Belt region for the three fuzzy sets. I defined the Rust Belt region as the states of Connecticut, Illinois, Indiana, Massachusetts, Michigan, New York, Ohio, and Pennsylvania.[6] Linked by Interstate 90, these states have a similar history in the production of automobiles, electronics, metals, and machinery, and their cities display a similar social fabric shaped by employment in factories.

All cities within this region were included into the study, with the following exceptions. The major metropolitan areas of Boston, New York, Philadelphia, Pittsburgh, Cleveland, Detroit, and Chicago were excluded. Bridgeport, Connecticut; Lowell, Massachusetts; and Gary, Indiana, were also excluded. Complete data on these cities were not available. Finally, a number of cities, mostly smaller in size, were also excluded due to data limitations. Otherwise, consistent, over-time, social and economic data were gathered for 69 metropolitan statistical areas (MSAs).[7]

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[6] Even the Rust Belt region has an imprecise definition. It can refer to all the Great Lakes states (e.g., Crandall 1993) or include New England states and New Jersey (e.g., Bluestone and Harrison 1982). Wisconsin and Minnesota were excluded from my definition because they have stronger histories in food production rather than the metals. New Jersey is a state whose manufacturing was largely based in chemical production, and therefore, it is also excluded.

[7] Throughout, use of the terms "city" or "urban area," or discussion of particular cities refers to the MSA. The Office of Management and Budget (OMB) for Federal statistical purposes, defines a metropolitan statistical area as "consisting of a recognized population

Table 2.2 identifies each city and its scores for membership into the three fuzzy sets. In this table, "M" refers to the fuzzy set for medium-size, "I" refers to the fuzzy set for manufacturing identity, and "V" refers to the fuzzy set for vulnerability.

Table 2.2: The Rust Belt Cities and Their Fuzzy Set Membership Scores

MSA	State	M	I	V
Akron	Ohio	1	1	0.571429
Albany	New York	1	0.42217	0.02
Allentown	Pennsylvania	1	1	0.514286
Altoona	Pennsylvania	0.2	0.909781	0.431429
Anderson	Indiana	0.2	1	0
AnnArbor	Michigan	0.2	1	0.685714
BattleCreek	Michigan	0.2	1	0.942857
BayCity	Michigan	0.2	0.910431	1
Binghamton	New York	0.4	1	0.4
Bloomington	Indiana	0.2	0.597639	1
Bloomington	Illinois	0.2	0.179685	0
Buffalo	New York	0.6	0.995789	0.828571
Canton	Ohio	0.4	1	1
Champaign	Illinois	0.2	0	0
Cincinnati	Ohio	0.6	0.914915	0.8
Columbus	Indiana	0	1	1
Columbus	Ohio	0.6	0.608578	0.971429
Danville	Illinois	0	1	1
Davenport	Illinois	0.4	0.78076	1
Dayton	Ohio	0.8	1	1
Decatur	Illinois	0.2	1	0
Elkhart	Indiana	0.2	1	1
Elmira	New York	0.2	1	0.942857
Erie	Pennsylvania	0.4	1	0.885714
Evansville	Indiana	0.4	0.942094	0.18
Flint	Michigan	1	1	1
Fort Wayne	Indiana	0.4	1	1
Grand Rapids	Michigan	1	0.968165	1
Harrisburg	Pennsylvania	1	0.450616	0.4
Hartford	Connecticut	0.6	1	0.485714

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nucleus and adjacent communities that have a high degree of integration with that nucleus."

Holland	Michigan	0.2	1	1
Indianapolis	Indiana	0.6	0.712172	1
Jackson	Michigan	0.2	1	1
MSA	State	M	I	V
Johnstown	Pennsylvania	0.2	0.988784	0
Kalamazoo	Michigan	0.4	1	0.771429
Kankakee	Illinois	0	0.95784	0.457143
Kokomo	Indiana	0	1	0.514286
Lafayette	Indiana	0.2	0.493717	0.828571
Lancaster	Pennsylvania	0.4	1	0.657143
Lansing	Michigan	0.4	0.613914	1
Lima	Ohio	0.2	0.999475	0.885714
Mansfield	Ohio	0.2	1	1
Michigan City	Indiana	0.2	1	1
Monroe	Michigan	0.2	0.753963	0.114286
Muncie	Indiana	0.2	1	1
Muskegon	Michigan	0.2	1	1
New Haven	Connecticut	1	0.999296	0.914286
Niles	Michigan	0.2	1	1
Norwich	Connecticut	0.2	0.876355	0.142857
Peoria	Illinois	0.4	1	0.328571
Pittsfield	Massachusetts	0.2	1	1
Reading	Pennsylvania	0.4	1	0.885714
Rochester	New York	0.6	1	0.365714
Rockford	Illinois	0.4	1	1
Saginaw	Michigan	0.2	1	1
Scranton	Pennsylvania	1	1	0.257143
South Bend	Indiana	0.4	0.905022	1
Springfield	Illinois	0.2	0.102306	0.514286
Springfield	Massachusetts	1	0.860038	0.514286
Springfield	Ohio	0.2	1	0.628571
Syracuse	New York	1	0.677545	1
Terre Haute	Indiana	0.2	0.607563	0.342857
Toledo	Ohio	1	0.917629	1
Utica-Rome	New York	0.4	0.923945	0.971429
Weirton	Ohio	0.2	1	0.4
Williamsport	Pennsylvania	0.2	1	0.314286
Worcester	Massachusetts	1	1	0.828571
York	Pennsylvania	0.4	1	0.6
Youngstown	Ohio	1	1	1

With the fuzzy sets constructed, the next step was to define the cities of primary interest to this study. To identify the population of medium-sized, manufacturing-based, vulnerable cities, the fuzzy set scores in the table above were used to position cities into a property space or "multidimensional vector space" (Ragin, 2000: 181). A property space is an imaginary space whose corners represent a different combination of qualitative characteristics, or a different type of case. The number of corners is equal to 2□, with *n* being the number of fuzzy sets. In this study, the three fuzzy sets described above intersect to create a property space with eight corners—a cube. The eight corners represent the ideal type city fitting the following descriptions:

1.) Medium-sized, with a manufacturing identity, and vulnerable (MIV)
2.) Medium-sized, with a manufacturing identity, and not vulnerable (MI~V)
3.) Medium-sized, without a manufacturing identity, and vulnerable (M, ~I,V)
4.) Medium-sized, without a manufacturing identity, and not vulnerable (M,~I,~V)
5.) Not medium-sized, with a manufacturing identity, and vulnerable (~M, I, V)
6.) Not medium-sized, with a manufacturing identity, and not vulnerable (~M, I, ~V)
7.) Not medium-sized, without a manufacturing identity, and vulnerable (~M,~I,V)
8.) Not medium-sized, without a manufacturing identity, and not vulnerable (~M,~I,~V)

The fuzzy scores for the three sets are combined to determine in which of these eight corners a city has maximum membership. Cases with different maximum membership scores in different corners of the property space are likely to be very

different cases. Those that have maximum membership scores in the same corner of the property space are likely to be comparable.

The principles of set algebra were used to measure a case's degree of membership into the different corners of the space. For some of the corners, non-membership scores needed to be assigned: scores for membership into a not medium-sized set, no manufacturing identity set, and not vulnerable set. To do this, the principle of negation was used, which asserts a case's non-membership score is equal to 1 minus its membership score (Ragin 2000: 172). For example, Altoona's membership into the set of medium-sized cities is .2. Therefore, its membership into the set of not medium-sized cities is: 1 - .2 = .8.

To plot the cities into the property space, the principle of intersection was followed. This principle asserts the minimum score between the three sets dictates degree of membership into the corners of the property space (Ragin 2000: 183-184). For example, a city may have membership scores of .2 in the set of medium size, a score of 1 in the set for manufacturing identity, and a score of 1 in the set of vulnerable cities. The low score of .2 would be used as this city's membership score into the corner of the property space where the ideal type medium-sized, manufacturing, vulnerable city is represented. Basically, this city would have low membership into this corner.

Table 2.3 provides the membership scores of each city in the different corners of the property space. The first three columns repeat the information provided in table 2.2 and are followed by three columns showing the non-membership scores into these three

sets. The last eight columns identify all of the corners of the property space and record each city's degree of membership into that corner.

Table 2.3: City Membership Scores into Property-Space Locations

MSA	M	I	V	~M	~I	~V	MIV	MI~V	M~IV	M~I~V	~MIV	~MI~V	~M~IV	~M~I~V
Akron	1	1	0.571	0	0	0.428	0.571	0.428	0	0	0	0	0	0
Albany	1	0.422	0.02	0	0.577	0.98	0.02	0.422	0.02	0.577	0	0	0	0
Allentown	1	1	0.514	0	0	0.485	0.514	0.485	0	0	0	0	0	0
Altoona	0.2	0.909	0.431	0.8	0.090	0.568	0.2	0.2	0.090	0.090	0.431	0.568	0.090	0.090
Anderson	0.2	1	0	0.8	0	1	0	0.2	0	0	0	0.8	0	0
AnnArbor	0.2	1	0.685	0.8	0	0.314	0.2	0.2	0	0	0.685	0.314	0	0
BattleCreek	0.2	1	0.942	0.8	0	0.057	0.2	0.057	0	0	0.8	0.057	0	0
BayCity	0.2	0.910	1	0.8	0.089	0	0.2	0	0.089	0	0.8	0	0.089	0
Binghamton	0.4	1	0.4	0.6	0	0.6	0.4	0.4	0	0	0.4	0.6	0	0
Bloomington	0.2	0.597	1	0.8	0.402	0	0.2	0	0.2	0	0.597	0	0.402	0
Bloomington, IL	0.2	0.179	0	0.8	0.820	1	0	0.179	0.2	0.2	0	0.179	0	0.8
Buffalo	0.6	0.995	0.828	0.4	0.004	0.171	0.6	0.171	0.004	0.004	0.4	0.171	0.004	0.004
Canton	0.4	1	1	0.6	0	0	0.4	0	0	0	0.6	0	0	0
Champaign	0.2	0	0	0.8	1	1	0.2	0	0	0.2	0	0	0	0.8
Cincinnati	0.6	0.914	0.8	0.4	0.085	0.2	0.6	0.2	0.085	0.085	0.4	0.2	0.085	0.085
Columbus	0	1	1	1	0	0	0	0	0	0	1	0	0	0
Columbus, OH	0.6	0.608	0.971	0.4	0.391	0.028	0.6	0.028	0.391	0.028	0.4	0.028	0.391	0.028
Danville	0	1	1	1	0	0	0	0	0	0	1	0	0	0
Davenport	0.4	0.780	1	0.6	0.219	0	0.4	0	0.219	0	0.6	0	0.219	0
Dayton	0.8	1	1	0.2	0	0	0.8	0	0	0	0.2	0	0	0
Decatur	0.2	1	0	0.8	0	1	0.2	0.2	0	0	0	0.8	0	0
Elkhart	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
Elmira	0.2	1	0.942	0.8	0	0.057	0.2	0.057	0	0	0.8	0.057	0	0
Erie	0.4	1	0.885	0.6	0	0.114	0.4	0.114	0	0	0.6	0.114	0	0
Evansville	0.4	0.942	0.18	0.6	0.057	0.82	0.18	0.4	0.0579	0.057	0.18	0.6	0.057	0.057
Flint	1	1	1	0	0	0	1	0	0	0	0	0	0	0
Fort Wayne	0.4	1	1	0.6	0	0	0.4	0	0	0	0.6	0	0	0

Grand Rapids	1	0.968	1	0	0.031	0	0.968	0	0.031	0	0	0	0	0
MSA	M	I	V	~M	~I	~V	MIV	MI~V	M~IV	M~I~V	~MIV	~MI~V	~M~IV	~M~I~V
Harrisburg	1	0.450	0.4	0	0.549	0.6	0.4	0.450	0.4	0.549	0	0	0	0
Hartford	0.6	1	0.485	0.4	0	0.514	0.485	0.514	0	0	0.4	0.4	0	0
Holland	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
Indianapolis	0.6	0.712	1	0.4	0.287	0	0.6	0	0.287	0	0.4	0	0.287	0
Jackson	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
Johnstown	0.2	0.988	0	0.8	0.011	1	0	0.2	0	0.011	0	0.8	0	0.011
Kalamazoo	0.4	1	0.771	0.6	0	0.228	0.4	0.228	0	0	0.6	0.228	0	0
Kankakee	0	0.957	0.457	1	0.042	0.542	0	0	0	0	0.457	0.542	0.042	0.042
Kokomo	0	1	0.514	1	0	0.485	0	0	0	0	0.514	0.485	0	0
Lafayette	0.2	0.493	0.828	0.8	0.506	0.171	0.2	0.171	0.2	0.171	0.493	0.171	0.506	0.171
Lancaster	0.4	1	0.657	0.6	0	0.342	0.4	0.342	0	0	0.6	0.342	0	0
Lansing	0.4	0.613	1	0.6	0.386	0	0.4	0	0.386	0	0.6	0	0.386	0
Lima	0.2	0.999	0.885	0.8	0	0.114	0.2	0.114	0	0	0.8	0.114	0	0
Mansfield	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
Michigan City	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
Monroe	0.2	0.753	0.114	0.8	0.246	0.885	0.114	0.2	0.2	0.2	0.114	0.753	0.114	0.246
Muncie	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
Muskegon	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
New Haven	1	0.999	0.914	0	0	0.085	0.914	0.085	0	0	0	0	0	0
Niles	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
Norwich	0.2	0.876	0.142	0.8	0.123	0.857	0.142	0.2	0.123	0.123	0.142	0.857	0.123	0.123
Peoria	0.4	1	0.328	0.6	0	0.671	0.328	0.4	0	0	0.328	0.671	0	0
Pittsfield	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
Reading	0.4	1	0.885	0.6	0	0.114	0.4	0.114	0	0	0.6	0.114	0	0
Rochester	0.6	1	0.365	0.4	0	0.634	0.365	0.6	0	0	0.365	0.4	0	0
Rockford	0.4	1	1	0.6	0	0	0.4	0	0	0	0.6	0	0	0
Saginaw	0.2	1	1	0.8	0	0	0.2	0	0	0	0.8	0	0	0
Scranton	1	1	0.257	0	0	0.742	0.257	0.742	0	0	0	0	0	0

South Bend	0.4	0.905	1	0.6	0.094	0	0.4	0	0.094	0	0.6	0	0.094	0
Springfield, IL	0.2	0.102	0.514	0.8	0.897	0.485	0.102	0.102	0.2	0.2	0.102	0.102	.514	0.485
MSA	M	I	V	~M	~I	~V	MIV	MI~V	M~IV	M~I~V	~MIV	~MI~V	~M~IV	~M~I~V
Springfield, MA	1	0.860	0.514	0	0.139	0.485	0.514	0.485	0.139	0.139	0	0	0	0
Springfield, OH	0.2	1	0.628	0.8	0	0.371	0.2	0.2	0	0	0.628	0.371	0	0
Syracuse	1	0.677	1	0	0.322	0	0.67	0	0.322	0	0	0	0	0
TerreHaute	0.2	0.607	0.342	0.8	0.392	0.657	0.342	0.2	0.2	0.2	0.342	0.607	0.342	0.392
Toledo	1	0.917	1	0	0.082	0	0.917	0	0.082	0	0	0	0	0
UticaRome	0.4	0.923	0.971	0.6	0.076	0.028	0.4	0.028	0.076	0.028	0.6	0.028571	0.076	0.028
Weirton	0.2	1	0.4	0.8	0	0.6	0.2	0.2	0	0	0.4	0.6	0	0
Williamsport	0.2	1	0.314	0.8	0	0.685	0.2	0.2	0	0	0.314	0.685	0	0
Worcester	1	1	0.828	0	0	0.171	0.828	0.171	0	0	0	0	0	0
York	0.4	1	0.6	0.6	0	0.4	0.4	0.4	0	0	0.6	0.4	0	0
Youngstown	1	1	1	0	0	0	1	0	0	0	0	0	0	0

With all of the cities positioned in the property space, the advantages of the fuzzy set approach become clearer. My first objective in this chapter was to dissect the general definition of Rust Belt cities to identify the different kinds of cities in the region. The purpose of doing this was to isolate those cities most closely resembling the kind of city frequently used in the case-oriented research on industrial decline. The maximum membership scores produced through the fuzzy sets approach satisfied this objective. These scores, which are highlighted in table 2.3, indicate the corner of the property space to which each city is closest. Each corner of the property space represents a different kind of city. The cities in this region had maximum membership scores in seven out of the eight possible kinds. Thus, there are seven different types of cities in the region. The cities of primary interest are those with maximum membership scores in the column labeled, "MIV" (Group 1). These are the cities that conform most closely to the ideal type city frequently found in the case-oriented research—the Rust Belt cities. This does not mean the cities in other groups are not of interest. These groups are an added advantage of the fuzzy set approach. They will be maintained throughout the research, allowing for a comprehensive analysis of the economic experiences of the different types of cities in this region. The cities are grouped by type in table 2.4.

Table 2.4: Types of Cities According to Membership Scores into the Intersections of the Fuzzy Sets

Group (Property Space Corner)	MSAs
Group 1 (MIV)	Akron, Allentown, Buffalo, Cincinnati, Columbus (Ohio), Dayton, Flint, Grand Rapids, Indianapolis, New Haven, Springfield (Mass.), Syracuse, Toledo,

	Worcester, Youngstown
Group 2 (MI~V)	Hartford, Rochester, Scranton
Group 3 (M~I~V)	Albany, Harrisburg
Group 4 (~MIV)	Ann Arbor, Battle Creek, Bay City, Bloomington (Indiana), Canton, Columbus (Indiana), Danville, Davenport, Elkhart, Elmira, Erie, Fort Wayne, Holland, Jackson, Kalamazoo, Kokomo, Lancaster, Lansing, Lima, Mansfield, Michigan City, Muncie, Muskegon, Niles, Pittsfield, Reading, Rockford, Saginaw, South Bend, Springfield (Ohio), Utica, York
Group 5 (~MI~V)	Altoona, Anderson, Binghamton, Decatur, Evansville, Johnstown, Kankakee, Monroe, Norwich, Peoria, Terre Haute, Weirton, Williamsport
Group 6 (~M~IV)	Lafayette, Springfield (Illinois)
Group 7 (~M~I~V)	Bloomington (Illinois), Champaign

The maximum membership scores from table 2.3 also evaluate how closely cities conform to a specific type, and thus, how comparable cities within a certain group are to one another. The closer a city's score is to 1, the closer that city resembles the ideal type city of its kind. For instance, referring to table 2.3, with scores of 1 in the MIV group, Flint and Youngstown are the ideal type Rust Belt city. They are also very comparable to one another. On the other hand, with a maximum membership score of .514 in the MIV group, Allentown is an example of a Rust Belt city, but not a very good one. Additionally, it is not the best comparison to Youngstown or Flint, and such direct comparisons should be done with caution. This demonstrates the second advantage of the

fuzzy set approach; it preserves the variation between these cities rather than treating them the same simply because they meet certain criteria. This also satisfies my first objective in this chapter.

To meet my second objective, cities within each group described in table 2.4 had to be further parceled according to how well they performed over the thirty year period of economic restructuring from 1970 to 2000. This would complete the classification system for this research. Part II of this chapter explains how this was done.

Determining "Stable," "Struggling," and "Devastated" Cities

My second objective in this chapter is to determine the extent to which the cities within each group described above experienced negative effects from deindustrialization. Factory shutdowns are recognized as the first step in a downward spiral for industrial cities. This was clearly shown by Bluestone and Harrison (1982) in their classic study. They documented a host of negative impacts, including a "ripple effect" in which jobs in other sectors of the local economy disappeared soon after those in manufacturing (1982: 67). Rising unemployment and a growing poverty rate were accompanied by income inequality, as the middle class started to erode (see also Harrison & Bluestone 1988). In some cases, this affected the public sector. The demand for public assistance increased with the loss of work, and tax revenues declined with major employers evacuating the area. As a result, the public sector found itself overburdened financially and also initiated layoffs. Additionally, when manufacturing plants left industrial cities, residents fled to find jobs elsewhere; the total population plummeted in these urban areas. At the same time, property values dropped while property taxes increased. This provided even more

incentive for residents to leave. Exacerbating these problems, crime rates frequently rose when work disappeared (e.g., Wilson 1994), which made these cities even less desirable places to live. The physical landscape of the industrial city became one of vacant, run-down buildings and homes. Cumulatively, the economic and social problems caused by deindustrialization made once thriving urban areas undesirable places to live and transformed them into ghost towns over a relatively short period of time.

To determine the extent to which cities had experienced this downward spiral, Census data were used to create an index, ranking cities according to how well they performed from 1970 to 2000 on the following socio-economic indicators:

- Percent change in total population from 1970 to 2000
- Vacant homes as a percent of all housing units
- Poverty rate
- Percent of families in the national middle income bracket
- Median household owner's value
- Unemployment rate
- Per capita income

The ranking for all seven indicators were then summed to provide an overall performance score for each city. Table 2.5 provides the rankings of each city for each indicator by group as well as each city's total score.

Table 2.5: Change Rankings for Each City by Group

Group 1: MVI								
City	□ in Total Pop.	□ in % Vacant Housing	□ in Poverty Rate	□ in % Mid-Inc Families	□ in Home Value	□ in Unemp. Rate	□ in Per Cap Income	Total Score
Akron	9	6	5	4	9	4	7	44
Allentown	4	5	4	13	2	11	6	45
Buffalo	15	13	8	10	14	10	13	83
Cincinnati	6	4*	1	5	8	4	5	33
Columbus, OH	2	4*	2	9	7	3	4	31
Dayton	13	11	7	1	12	6	11	61
Flint	12	10	11	11	10	8	14	76
Grand Rapids	1	1	3	2	6	1	8	22
Indianapolis	3	4*	3	7	4	3	2	26
New Haven	7	7	6	14	3	12	3	52
Springfield, MA	8	3	12	12	5	7	9	57
Syracuse	10	9	10	6	15	7	10	67
Toledo	11	8	8	3	11	9	12	62
Worcester	5	2	6	15	1	5	1	35
Youngstown	14	12	9	8	13	2	15	73
Group 2: MI~V								
Hartford	1	1	2	3	1	3	1	12
Rochester	2	2	3	1	3	2	3	16
Scranton	3	3	1	2	2	1	2	14
Group 3: M~I~V								
Albany	2	1	2	1	1	2	1	10
Harrisburg	1	2	1	2	2	1	2	11

Group 4: ~MIV								
Ann Arbor	5	1	2	22	1	2	1	34
Battle Creek	21	7	15	5	13	17	21	99
Bay City	24	7	10	17	23	11	7	99
Bloomington, IN	6	4	23	9	6	4	11	63
Canton	17	13	11	20	14	8	13	96
Columbus, IN	8	11	1	18	7	5	2	52
Danville	30	18	15	4	28	25	25	145
Davenport	20	6	11	7	29	14	15	102
Elkhart	3	14	8	1	12	9	20	67
Elmira	28	11	13	12	31	25	21	141
Erie	15	12	19	24	20	20	19	129
Fort Wayne	10	13	4	6	19	17	5	74
Holland	1	5	2	21	2	3	4	37
Jackson	13	9	6	3	10	6	22	69
Kalamazoo	9	3	18	5	9	19	15	78
Kokomo	18	11	3	16	18	1	3	70
Lancaster	2	10	1	8	4	13	9	48
Lansing	12	7	19	4	15	7	10	74
Lima	22	19	16	13	21	15	23	129
Mansfield	20	13	12	14	25	13	24	121
Michigan City	16	15	14	2	17	13	18	95
Muncie	25	20	22	24	24	24	14	153
Muskegon	14	11	10	19	13	3	23	93
Niles-B. Harbor	19	2	7	19	16	9	17	89
Pittsfield	27	19	18	15	8	16	2	105
Rockford	11	5	5	10	27	21	16	95
Saginaw	23	8	20	23	26	18	8	126
South Bend	14	13	17	26	11	12	12	105

Springfield, OH	26	21	9	11	22	22	15	126
Utica	29	22	21	19	30	10	22	153
York	4	17	1	7	5	18	10	62
Group 5: ~MI~V								
Altoona	9	9	6	10	3	9	6	52
Anderson	8	5	8	4	7	2	4	38
Binghamton	10	11	11	3	13	4	10	62
Decatur	11	10	13	5	11	7	7	64
Evansville	2	4	2	1	4	3	3	19
Johnstown	12	12	7	12	10	10	8	71
Kankakee	4	2	9	2	6	7	9	39
Monroe	1	6	4	7	1	1	2	22
Norwich	3	3	1	9	2	3	1	22
Peoria	6	7	10	6	9	4	5	47
Terre Haute	7	8	3	8	5	6	12	49
Weirton	13	13	12	11	12	8	13	82
Williamsport	5	5	5	13	8	5	11	52
Group 6: ~M~IV								
Lafayette	1	1	2	2	1	2	2	11
Springfield, IL	2	2	1	1	2	1	1	10
Group 7: ~M~I~V								
Bloomington, IL	1	1	1	2	1	2	1	9
Champaign, IL	2	2	2	1	2	1	2	12

*Cities have the same rank if they experienced equal changes. For instance, Cincinnati, Columbus, and Indianapolis each had a 1.1 change in percentage point in vacant housing units as a percentage of total housing from 1970 to 2000.

From the table above, cities with low total scores, meaning they had high rankings across all or most of the socio-economic indicators, were considered stable. Those with mid-range total scores were considered struggling, and cities with the highest total scores were considered devastated. Large breaks between the scores were used to set preliminary boundaries between performance categories. The change trends for each of the cities within each performance category were then graphed with the average change trends for all U.S. Metropolitan statistical areas for all indicators, except change in per capita income.[8]

Graphing the change trends against the average for all MSAs verified whether or not the natural breaks between the total index scores were good indicators of the boundaries between performance categories. Furthermore, some groups only had a handful of cases, and therefore, total scores were not reliable indicators of performance on their own. Using the graphs, every city within each group was carefully analyzed and compared to one another and all MSAs on average. Starting points in 1970, change scores, and end points in 2000 for each indicator for each city were taken into consideration to determine which performance category a city belonged. Once initial classifications were made, they were reevaluated to ensure cities within each performance category displayed similar trends. The final results, after continual adjustments to isolate similar cities, are presented for each group below.

[8] Per capita income data for all U.S. MSAs were unavailable. Otherwise, the graphs for all other indicators in the performance index are available in the appendix.

Table 2.6: Group 1 (MVI Cities) Parceled Into Performance Categories

Category	Cities	Score
Stable	Grand Rapids, Michigan	22
	Indianapolis, Indiana	26
	Columbus, Ohio	31
	Cincinnati, Ohio	33
	Worcester, Massachusetts	35
	Akron, Ohio	44
	Allentown, Pennsylvania	45
Struggling	New Haven, Connecticut	52
	Springfield, Massachusetts	57
	Dayton, Ohio	61
Devastated	Toledo, Ohio	62
	Syracuse, New York	67
	Youngstown, Ohio	73
	Flint, Michigan	76
	Buffalo, New York	83

In Group 1, according to the total scores, Grand Rapids was the highest ranked stable city. It clearly outperformed all cities in this group. While the percent of vacant housing, the poverty rate, and the unemployment rate rose for all MSAs on average, Grand Rapids experienced decreases. In fact, Grand Rapids had the highest percentage of vacant housing and the highest unemployment rate out of all cities in this group in 1970, but one of the lowest percentages and rates by 2000. Additionally, while the middle class shrunk for all cities on average, it grew in Grand Rapids. Its median homeowner's value was below average in 2000 but from it rose considerably from a low starting point in 1970. In sum, Grand Rapids was the only city in this group that demonstrated consistently positive trends over the thirty year period of restructuring, and its end points in 2000 on each socio-economic indicator were higher than average. It is the best example of a stable city.

Indianapolis, Columbus, and Cincinnati demonstrated very similar trends to one another. On all indicators, except vacant housing and median house value, their starting points were better than average as well as their end points. Even though they ended with homeowner's values lower than average, they all demonstrated greater change than all MSAs on average. Additionally, these three cities started with better than average poverty rates and lowered them. In sum, these cities, except for poor performance on vacant housing, maintained their good starting points over the period of economic restructuring and improved their good standing on one indicator (poverty).

Worcester, Allentown and Akron were similar cities. They mirrored all MSAs on average in the direction of their changes but had better than average starting points and end points. The exceptions were that Worcester's median homeowner's value started below average and ended above average, and Akron's unemployment rate started above average and ended below average. Yet, their rates of change were not as sharp as the other cities in the stable category and occasionally worse than average. Overall, these cities maintained advantages they started with but struggled more than other stable cities to do so.

The struggling cities did not always preserve better than average starting points. They often ended with average values in 2000 for a couple indicators or even tumbled below average. For instance, Dayton's percent of vacant housing started well below average and ended above average, as did Springfield's poverty rate. They demonstrated below average change in median homeowner's value as well, except for New Haven. Essentially, these cities experienced sluggish change over the period of economic

restructuring that transformed them from cities in good standing in 1970 into cities similar to all MSAs on average by 2000. In most cases, these would probably be considered devastated cities, but the devastated cities in this group spiraled downwards.

The cities in the devastated performance category in this group had better than average starting points in 1970 for several indicators that became worse than average by 2000. For unemployment rate they started higher than average in 1970 and worsened their positions by 2000. Their homeowner's values increased slower than all MSAs on average, leaving them with lower values than cities they started ahead of in 1970 and well below all MSAs on average. In general, they started in better than average positions and collapsed, or they moved from poor starting points to worse end points.

When the cities in Groups 2 and 3 were compared to all MSAs on average, there were no stable cities similar to Grand Rapids from Group 1. Instead, Hartford's changes reflect those of Worcester and Allentown above. It started in a better than average position on all indicators in 1970, its changes were in the same direction as all MSAs on average, and it ended in better than average positions in 2000. In other words, it preserved its good starting points.

Scranton demonstrated mixed results, which earned it placement into the struggling performance category. It experienced population loss, had a dramatic increase in vacant housing, and its homeowner's value consistently rose but remained below average in 2000. Otherwise, it lowered its poverty rate while all MSAs experienced an increase on average. It also lowered its unemployment rate from a worse than average starting point in 1970 to a better than average starting point in 2000.

Rochester is classified as a devastated city, as it tumbles on all socio-economic indicators in the index, except for percent of families in the middle income bracket. This increase however, is deceptive, as it is accompanied by growth in the percent of families in the lower income bracket and a decline in the percentage of families in the top income bracket. In all, Rochester failed to preserve or improve upon better than average starting points in 1970.

In Group 3, Albany and Harrisburg are indistinguishable. They both had better than average starting points for each indicator but experienced slow change, making them similar to all MSAs on average in 2000. They were classified as struggling cities. Table 2.7 details the classification of cities in Groups 2 and 3 into performance categories.

Table 2.7: Cities in Group 2 (MI~V) and Group 3 (M~I~V) Parceled Into Performance Categories

Group	Category	City	Score
Group 2 (MI~V)	Stable	Hartford, Connecticut	12
	Struggling	Scranton, Pennsylvaia	14
	Devastated	Rochester, New York	16
Group 3 (M~I~V)	Stable	NA	NA
	Struggling	Albany, New York	10
		Harrisburg, Pennsylvania	11
	Devastated	NA	NA

For Group 4, the natural breaks between the overall scores were very good indicators of the boundaries between performance categories. Below, table 2.8 shows the cities in this group by performance category.

Table 2.8: Cities in Group 4 (~MIV) Parceled Into Performance Categories

Category	Cities	Score
Stable	Ann Arbor, Michigan	34
	Holland, Michigan	37
	Lancaster, Pennsylvania	48
	Columbus, Indiana	52
	York, Pennsylvania	62
	Bloomington, Indiana	63
	Elkhart, Indiana	67
	Jackson, Michigan	69
	Kokomo, Indiana	70
	Fort Wayne, Indiana	74
	Lansing, Michigan	74
	Kalamazoo, Michigan	78
Struggling	Niles-Benton Harbor, Michigan	89
	Muskegon, Michigan	93
	Reading, Pennsylvania	94
	Rockford, Illinois	95
	Michigan City, Indiana	95
	Canton, Ohio	96
	Bay City, Michigan	99
	Battle Creek, Michigan	99
	Davenport, Illinois	102
	South Bend, Indiana	105
	Pittsfield, Massachusetts	105
Devastated	Mansfield, Ohio	121
	Springfield, Ohio	126
	Saginaw, Michigan	126
	Erie, Pennsylvania	129
	Lima, Ohio	129
	Elmira, New York	141
	Danville, Illinois	145
	Muncie, Indiana	153
	Utica, New York	153

Out of the stable cities, Ann Arbor and Holland were the strongest cities. For each socio-economic indicator in 1970 they started above average and improved their position by 2000, or they started in worse than average positions in 1970 and ended better

than average in 2000. Lancaster, Columbus, and York also performed well, but these cities experienced increases in vacant housing and had homeowner's values that consistently rose over the thirty year period but remained below average in 2000. For the most part, the stable cities ranked lower than York had better than average starting points in 1970 on at least three of the seven socio-economic indicators in the index and they preserved their standing on these indicators by 2000. However, the lower ranked stable cities demonstrated mixed results on vacant housing (Kokomo, Fort Wayne, and Bloomington) and unemployment rates (Fort Wayne, Elkhart, and Kalamazoo). They also had homeowner's values that rose over the thirty year period, but still remained below average. This made them somewhat similar to the struggling cities, but their end points in 2000 were much better than average, which kept them in the stable category.

Decline is apparent in the struggling cities in this group. While these cities often had better than average starting points for each indicator in the index, some had worse than average end points in 2000. This is an especially noticeable trend for vacant housing and unemployment rates. When these cities preserved their better than average starting points, their end points were closer to all MSAs on average. For instance, all of these cities, except Niles-Benton Harbor, had much lower than average poverty rates in 1970, but these rates increased dramatically from 1970 to 2000, making them similar to all MSAs on average by 2000. It is in this group that the middle class erodes for some cities as well. Additionally, homeowner's values start and remain lower than the stable cities from this group and all MSAs on average. Overall, the story for these cities is one of

decline, but their decline was not so sharp as to leave them in worse than average positions by 2000. Therefore, they were classified as strggling cities.

The trends for the devastated cities in this group parallel those for the devastated cities in Group 1. These cities have declined dramatically over the last thirty years. They only experience positive changes in homeowner's value, but they lag far behind the other cities in this group and all MSAs on average.

Table 2.9: Cities in Group 5 (~MI~V) Parceled Into Performance Categories

Category	Cities	Scores
Stable	Evansville, Indiana	19
	Monroe, Michigan	22
	Norwich, Connecticut	22
Struggling	Anderson, Indiana	38
	Kankakee, Illinois	39
	Peoria, Illinois	47
	Terre Haute, Indiana	49
	Altoona, Pennsylvania	52
	Williamsport, Pennsylvania	52
Devastated	Binghamton, New York	62
	Decatur, Illinois	64
	Johnstown, Pennsylvania	71
	Weirton, Ohio	82

As shown in Table 2.9, there were three stable cities in Group 5: Evansville, Monroe, and Norwich. Interestingly, these cities demonstrated the ability to reverse their fortunes on several indicators. Thus, they are better described as rebound cities than stable cities.

Similar to the cities in the other groups, the struggling cities in Group 5 demonstrated a mix of positive and negative trends across the indicators in the index. In particular, they demonstrated increasing unemployment and poverty rates and some of

the cities lost population, which was not the case for the stable cities. This made the boundary between the stable and struggling cities clear.

The bottom four cities plummet from better than average starting points in 1970 on most indicators to the worst end points in 2000 on nearly every indicator. Binghamton is the exception, as its poverty rate and unemployment rate in 2000 is near all MSAs on average. However, Binghamton's impressive decline from favorable 1970 starting points make it a devastated city.

The final two groups each consist of two cities. Except for Springfield, Illinois, these cities are best known for their colleges and they are likely to be quite similar. For now, they are analyzed separately, but this may change later as more is learned about them. Table 2.10 reveals their breakdown by performance.

Table 2.10: Cities in Group 6 (~M~IV) and Group 7 (~M~I~V) Parceled Into Performance Categories

Group	Category	Cities	Scores
~M~IV	Stable	Springfield, Illinois	10
	Struggling	Lafayette, Indiana	11
	Devastated	NA	NA
~M~I~V	Stable	NA	NA
	Struggling	Bloomington, Illinois	9
		Champaign, Illinois	12
	Devastated	NA	NA

In Group 6, Springfield is classified as a stable city, but it is not similar to the stronger stable cities in other groups. It had a large increase in vacant housing and the increase in homeowner's value in Springfield was worse than average. However, Springfield experienced population growth, a drop in poverty rates, an increase in the percent of families in the middle class, and it preserved a very low unemployment rate.

These positive trends placed Springfield in the top performance category, but it is a weak stable city. Lafayette, Indiana, is the other city in Group 6. It demonstrates the same mix of positive and negative trends as the struggling cites in other groups and is classified as such.

Finally, Group 6 also consists of two cities, both of which experienced a mix of positive and negative changes. Both were classified as struggling cities.

At this point, the classification system for the Rust Belt cities is complete. The cities were first placed into groups of comparable cities and then classified into performance categories. Table 2.11 provides a final overview of the classification system as a whole.

Table 2.11: The Completed Classification System for Rust Belt Cities

Group 1 (MIV)		
Stable Cities	Struggling Cities	Devastated Cities
Grand Rapids, MI Indianapolis, IN Cincinnati, OH Columbus, OH Worcester, MA Akron, OH Allentown, PA	New Haven, CT Springfield, MA Dayton, OH	Toledo, OH Syracuse, NY Youngstown, OH Flint, MI Buffalo, NY
Group 2 (MI~V)		
Hartford, CT	Scranton , PA	Rochester, NY
Group 3 (M~I~V)		
NA	Albany, NY Harrisburg, PA	NA
Group 4 (~MIV)		
Ann Arbor, MI Holland, MI Lancaster, PA Columbus, IN York, PA Bloomington, IN Elkhart, IN Jackson, MI Kokomo, IN Fort Wayne, IN Lansing, MI Kalamazoo, MI	Niles-Benton Harbor, MI Muskegon, MI Reading, PA Rockford, IL Michigan City, IN Canton, OH Bay City, MI Battle Creek, MI Davenport, IL South Bend, IN Pittsfield, MA	Mansfield, OH Springfield, OH Saginaw, MI Erie, PA Lima, OH Elmira, NY Danville, IL Muncie, IN Utica, NY
Group 5 (~MI~V)		
Evansville, IN Monroe, MI Norwich, CT	Anderson, IN Kankakee, IL Peoria, IL Terre Haute, IN Altoona, PA Williamsport, PA	Binghamton, NY Decatur, IL Johnstown, PA Weirton, OH
Group 6 (~M~IV)		
Springfield, IL	Lafayette, IN	NA
Group 7 (~M~I~V)		
NA	Bloomington, IL Champaign, IL	NA

Conclusion

My first objective in this chapter was to dissect the broad definition for Rust Belt cities to identify different subgroups of cities that existed in the region in 1970. Additionally, I wanted to assess how well cities fit into their subgroups and how comparable they were to one another. I accomplished this through a fuzzy set approach. I identified seven groups of cities. Within these groups, the fuzzy sets scores indicated how good of an example each city was of each type and how comparable cities within each group were to one another.

My second objective was to determine how cities within each subgroup experienced the period of economic restructuring from 1970 to 2000. I accomplished this by creating a performance index that ranked cities across a variety of socio-economic indicators. The rankings of the cities were then summed and I used the natural breaks in the overall scores to parcel the cities into three performance categories: stable cities, struggling cities, and devastated cities. Each city was then carefully analyzed in comparison to the others in its group and all MSAs on average. Each city's starting point in 1970, change scores, and end point in 2000 was examined for each indicator in the index. This was done to verify that each city in each performance category displayed similar trends. Adjustments were made when necessary to perfect the performance classifications.

By meeting these two objectives, I developed a classification system of cities in the Rust Belt region. The primary purpose of this system was to structure later analyses of economic trends and to serve as a tool for isolating the most comparable cities for

more in-depth case-studies. However, on its own, the classification system serves as a very detailed portrait of how cities in this region experienced the period of economic restructuring. Several general and several group-specific conclusions can be drawn from this portrait, advancing a more thorough understanding of economic restructuring in the region.

First, in general, there are a lot of stable cities in the region. This is surprising, as most research on deindustrialization traces the decline of Rust Belt cities and reinforces the idea that the region as a whole has decayed (e.g., Staudohar and Brown 1987). Stable cities had better than average starting points in 1970 for the socio-economic indicators in the performance index and did not experience sharp declines from these positions. This label is deceiving or four cities that have undergone booms during this time period: Grand Rapids, Ann Arbor, Holland, and Monroe. Surprisingly, all of these cities are in Michigan.

Second, there are not many rebound cities in the region. Rebound cities are those cities that demonstrated early decline but later recovered from their losses on the performance indicators to have better than average end points in 2000. This finding became apparent when graphs of performance were analyzed. Three cities demonstrated rebound trends: Akron, Evansville, and Scranton. While each of these cities deserves further attention, Akron in particular, appears to be a potentially remarkable story. Its fuzzy membership score (.571) suggests it is not the best example of an ideal Rust Belt city, because it scores low in the set of vulnerable cities. In 1970, Akron's manufacturing was not concentrated in metals, but it was a very vulnerable city as a tire producer. Few

cities experienced as rapid and complete an industrial collapse as Akron (Crandall 1993). Its emergence as a winner in 2000 is surprising. On the whole, comeback stories, such as Akron, are rare.

Third, it is important to note that devastated cities in this region did not just start poorly in 1970 and fail to catch up to other cities. These cities consistently plummeted from better than average starting points in 1970 on the indicators in the performance index. There is no question as to which cities in the region are devastated cities. Toledo, Syracuse, Danville, Muncie, Johnstown, and Weirton take incredible tumbles from being better than average cities on nearly all socio-economic indicators in 1970.

Finally, tentative conclusions can be drawn about states. As mentioned above, the clearest examples of stable cities (actually, stable cities) are in Michigan. This is an interesting finding since so much attention is given to the collapse of the automobile industry in the cities of Detroit and Flint. While these cities continue to experience well-publicized struggles, the other cities in the state are thriving. The cities in Indiana are also performing well. This deserves further research, but one possible explanation is that Indiana has always had a weak union presence. As a result, as manufacturing left the Rust Belt region, it left Indiana last (Crandall 1993, Perucci 1994). A final notable state trend is the cities in New York, except for Albany (a struggling city), are consistent failures. Highlighting its poor performance, New York cities were the only cities in the region to experience consistent declines in homeowner's value.

Some specific conclusions can be drawn from the groups as well. First, there are a surprising number of stable cities in Group 1: medium-sized cities with a manufacturing

identity and high vulnerability. Interestingly though, I expected cities with lower maximum membership scores in this group to be the stable cities, thinking degree of vulnerability or degree of manufacturing identity would explain stable and devastated cities. This was not the case. According to their membership scores, Grand Rapids and Worcester have high membership in the group of ideal Rust Belt cities. Additionally, as mentioned above, Akron should have a higher score. Each of these stable cities in 2000 were vulnerable manufacturing cities in 1970. Thus, being a stable city in this group does not depend on degree of vulnerability or manufacturing identity. However, size does seem to matter. Indianapolis, Cincinnati, and Columbus emerged as stable cities. According to their membership scores (.6), these cities are not the best examples of ideal Rust Belt cities and this is due to their larger populations.[9]

Another interesting finding is the divergent paths of Hartford, Connecticut, and Rochester, New York, in Group 2. I expected both of these cities to emerge as winners for a couple of reasons. First, they both occupied well above average starting points on most socio-economic indicators in the performance index in 1970. Second, they both seemed poised to take advantage of the new economy. It is common knowledge that Hartford is a city built on the insurance industry. On the other hand, Rochester has always been a high-tech city with Eastman Kodak and Xerox among its major employers. While Hartford appears to have capitalized on the new economy, Rochester has stumbled.

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[9] An argument can be made that Indianapolis, Cincinnati, and Columbus should be their own group. Their emergence as winners also suggests they may be misclassified. For now, they are analyzed as a part of Group 1, but this may change as more is learned about them.

Similar to Group 1, Group 4 has many stable cities. However, unlike Group 1, degree of vulnerability and manufacturing identity seems to better explain this outcome. Many of the stable cities in Group 4 had lower fuzzy scores in the set of vulnerable cities or manufacturing cities. The struggling and devastated cities had higher fuzzy scores in these sets and were better examples of this type of city. This finding also reinforces the finding from Group 1 that size matters. Larger cities with manufacturing in vulnerable industries do not decline as much as smaller cities with manufacturing in vulnerable industries. Still, Holland, Columbus, Elkhart, and Jackson are stable cities in this group that do not follow this trend.

There is a normal distribution of stable, struggling, and devastated cities in Group 5. These cities are remarkably similar in their starting points in 1970, and in their fuzzy membership scores. As a result, the classification system offers little insight into why these cities took divergent paths. Also, little is known about Groups 6 and 7 at this stage.

In the next chapter I start to explore the economic changes in the cities within each performance category to determine if certain types of employment change characterize the stable, struggling, and devastated cities. Thus, in the next chapter I start to answer the main question of this dissertation: what are the different economic trajectories Rust Belt cities have taken over the course of global economic restructuring from 1970 to 2000?

CHAPTER 3: SECTOR LEVEL EMPLOYMENT TRENDS AND CITY PERFORMANCE

In this chapter, I examine sector-level, or major group, employment changes to begin to identify the different economic trajectories Rust Belt cities have taken over the course of global economic restructuring. Unfortunately, sector-level data provides only a general picture of how employment has changed in cities, as numerous industries are grouped within each broad sector. Ideally, industry-level data would be used to track more specific changes in local economies to better answer the first question of this dissertation. However, longitudinal industry-level data is often incomplete for MSAs, especially smaller MSAs. Additionally, the Federal Government's decision to change industrial classification systems after 1992 from the Standard Industrial Classification System (SIC) to the North American Industrial Classification System (NAICS) broke the continuity of employment data at the industry-level. Data organized by NAICS codes are not comparable to SIC based data. Overcoming these problems to perform an industry-level analysis would be difficult without knowing the industries associated with success and failure of the Rust Belt cities. Therefore, a sector-level analysis is an appropriate starting point. While it may not highlight specific paths cities have taken, it narrows the focus on groups of industries that are important to success and failure, enabling the detailed industry-level analysis that can more thoroughly answer the main question of this dissertation.

In this chapter, I do not analyze cities by their group memberships, as defined by the classification system developed in Chapter 2. This will be done in the following chapter, which also examines sector-level employment trends. Here, I focus on the stable, struggling, and devastated cities in general. The objective is to determine the changes in sector level employment that accompany city performance. To meet this objective, I use multinomial logistic regression to determine the employment trends that distinguish the cities in the different performance categories. However, I first draw from the literature on the economic restructuring of cities to develop several hypotheses on likely employment trends for cities in each performance category. Then, I review the data I use, provide a description of my methods, and describe the results. I conclude with a discussion of the results and what they suggest about the more specific economic paths these cities may have taken from 1970 to 2000. These specific paths will be explored further at the industry-level later, when I discuss my case studies.

Uncovering Paths into the Global Economy: Hypotheses on Sector-Level Employment Change

The decline of manufacturing is widely recognized as the main reason cities in the Rust Belt region have collapsed economically and continue to struggle. The downward spiral accompanying deindustrialization, which was reviewed in the previous two chapters, imposes many obstacles to successful adaptation to the global economy. Mainly, it is difficult to lure new employers to impoverished and polluted cities that are in fiscal crisis. In addition, young, educated workers that are the foundation for the high-end of the service sector and the research-based, high-tech economy leave

deindustrialized cities. Their departure robs these cities of an essential resource they can build upon to recover from deindustrialization (Stanback and Noyelle 1982). Furthermore, some argue that the presence of a healthy manufacturing sector is the most important determinant for the successful transition to services (Cohen and Zysman 1987). A successful shift to services is a shift to producer services. These are services provided to businesses, including: financial, legal, and management services; advertising services; technology maintenance and development services; communications; personnel supply services, and security and insurance services. It is argued the presence of a healthy manufacturing sector in a city facilitates the development of these industries because manufacturing establishments are the primary consumers of their products (Markusen and Gwiasada 1993). Manufacturing decline not only hurts cities by taking away existing jobs and making cities unattractive sites for new investments, but it also strips cities of the resources they need to make successful transitions into the service sector. Therefore, I expect devastated cities to have experienced greater losses in manufacturing.

> Hypothesis 1: The greater the employment loss in manufacturing during the period of economic restructuring, the more likely a city is devastated.

Given the importance of manufacturing to a city's economic well being it is remarkable that there are stable cities at all in the Rust Belt region. Of course, the stable cities could simply be those that preserved their manufacturing base during the period of economic restructuring, but this does not necessarily have to be the case. While

manufacturing certainly still matters for the health of urban areas, it may not matter as much as some suggest. For example, Sassen (1991) notes that it is not necessarily the presence of manufacturing that is important for the development of producer services but rather the geographical dispersion of manufacturing facilities. As manufacturing spreads out geographically the demand for such services increases. Sassen suggests that manufacturing, no matter where it takes place, is important for producer services, but it is not necessarily the incubator of such services in a particular geographical area. She notes that the most successful cities in the global economy, the "global cities," have a strong producer services presence built around major corporate headquarters rather than manufacturing facilities. Unlike manufacturing plants that have migrated to the South and the Sunbelt regions of the United States or overseas, corporate concentration has been sustained in the Rust Belt. In fact, the Rust Belt region has always had a higher concentration of corporate headquarters than other regions of the United States (Logan and Molotch 1987). This does not mean smaller cities in the Rust Belt region with corporate headquarters are likely to become global cities on the scale of New York or Chicago. It simply means one of the main facilitators of producer services growth, corporate headquarters, are present in Rust Belt cities, creating a demand for such services in the absence of manufacturing establishments. Therefore, successful transitions to service-based local economies built around servicing corporate headquarters are possible.

If a producer services transition was made by cities in the Rust Belt, it would be reflected in employment growth in the finance, insurance and real estate sector (FIRE); the legal services, accounting, and engineering industries; and in miscellaneous business services. Most scholarly attention given to the rise of producer services has focused on employment growth in the FIRE sector, as the industries in this sector are the most lucrative and considered the most important for the development of world markets. Yet, it is employment in business services that has grown the most over the period of economic restructuring (Sassen 2001; Castells and Aoyama 1994). Employment growth in either of these sectors signals the presence of high-end services and a successful transition into the global economy. It is reasonable then to expect these changes to be found in stable cities.[10]

Hypothesis 2: The greater the employment gain in FIRE during the period of economic restructuring, the more likely a city is stable.

Hypothesis 3: The greater the employment growth in business services during the period of economic restructuring, the more likely a city is stable.

[10] Due to data limitations discussed in the introduction of this chapter, it was not possible to examine employment growth in legal, accounting, and engineering services. These industries are grouped in the professional services sector. The professional services sector is not used as an indicator for the growth of producer services because it is mostly composed of social service jobs, primarily in the health services.

Cities that have not developed a producer services infrastructure and have also failed to preserve manufacturing are likely to follow a post industrial path based on personal services and wholesale and retail trade. Employment growth in these sectors can signal the rise of a tourist-based economy as well as the presence of Wal-Mart economies, where large retailers replace manufacturers as the major employers in the area. Economic development strategies based on tourism have been heavily promoted by policymakers in Rust Belt cities as a cure for local economic woes. Yet, there is no research available that evaluates how successful such strategies have been. In fact, there may not be many instances of Rust Belt cities taking a tourism path since climate and pollution caused by manufacturing make such transitions extremely difficult. Thus, increased employment in these sectors, especially wholesale and retail trade, is more likely to reflect the growth of a Wal-Mart economy. The wholesale and retail trade sector is the lowest end of the service-based economy and has been associated with the creation of part-time work that pays below poverty-level wages (Sheets, Nord and Phelps 1987). It follows that cities experiencing large employment gains in retail and wholesale trade are likely to be devastated.

Hypothesis 4: The greater the employment gain in wholesale and retail trade during the course of economic restructuring, the more likely a city is devastated.

It is simple to assume devastated cities have attracted low end services while also experiencing greater employment loss in manufacturing, while cities in the stable

performance category have made successful transitions to high-end services. The type of employment change associated with struggling performance is less clear. This is because extant literature does not focus on these cities. However, one possibility is that these cities have not taken a new path at all; their employment trends have not changed much during the period of economic restructuring. Yet, with deindustrialization being recognized as such a serious problem in this region it seems more likely that struggling cities have undergone some sort of employment restructuring.

One possibility is that struggling cities have followed a professional services path. Some of the industries in this sector are associated with the high-end producer services, such as legal and accounting services, but employment change in professional services is mainly driven by the education and healthcare industries, which experienced the greatest growth from 1970 to 1997 (Economic Census, U.S. Census Bureau). In particular, industries in healthcare have been recognized as the engine for the U.S. economy. With sluggish growth in high-tech industries and high-end services and continued declines in manufacturing, it is America's booming healthcare industry that has acted as a security net (Mandel 2006). This is consistent with the findings of Wilson (1994). In his study on economic restructuring and the plight of urban blacks in Chicago, Wilson found that the healthcare industry and social services, especially jobs in hospitals, absorbed the low-skilled labor most affected by the loss of manufacturing. Wilson notes, "given the overall decline of jobs for less educated central city workers, the opportunity for employment in the social service industries prevented many inner-city workers from joining the growing ranks of the jobless" (33). In other cities in the Rust Belt region this may also be the

case. Social services may be acting as a security net and saving the struggling cities from joining the ranks of the devastated, while not quite offering the returns that could help them be stable cities.

Hypothesis 5: The greater the employment gain in professional services, the more likely a city is struggling.

Methods and Analysis

For this chapter, I use employment data from 1970 to 2000 at the MSA level from the U.S. Department of Commerce, Bureau of Economic Administration's (BEA) Regional Economic Accounts for the following sectors: manufacturing; transportation, communication, and utilities; wholesale and retail; finance, insurance and real estate; and government. Employment data for construction and service sector employment from 1970 to 2000 at the MSA level were obtained from the Department of Housing and Urban Development's (HUD) State of the Cities Data Systems. The BEA did not have consistent over time data at the MSA level for the construction sector and this is why HUD data were used instead. HUD service sector data were preferred over BEA data because HUD breaks the service sector into three specific categories: business and repair services, personal services, and professional services. These categories allow for a more detailed exploration of service sector employment. The table below provides the industries within each of the sectors. The mix of industries within each sector highlights the problem with sector-level data discussed in the introduction of this chapter.

Table 3.1: Economic Sectors and Their Component Industries

Major Sector	Industries
Construction	General contractors-residential buildings, Operative contractors-residential buildings, General contractors-nonresidential (industrial buildings and warehouses; institutional buildings; commercial, recreational and amusement buildings)
Manufacturing	Food and kindred products; Tobacco products; Textile mill products; Apparel and other textile products; Lumber and wood products; Furniture and fixtures; Paper and allied products; Printing and publishing; Chemicals and allied products; Petroleum and coal products; Rubber and miscellaneous products; Leather and leather products; Stone, clay, and glass production; Primary metal industries; Fabricated metals; Industrial machinery and equipment; Electronic and other electronic equipment; Transportation equipment; Instruments and related products; Miscellaneous manufacturing industries; Administrative and auxiliary employment in manufacturing
Transportation, Communication and Utilities	Local and interurban passenger transportation; Motor freight transportation and warehousing; Water transportation; Transportation by air; Pipelines, except natural gas; Transportation services; Communications (including cellular telephone services and on-line information providers); Electric, gas, and sanitary services
Wholesale and Retail Trade	Wholesale trade-durable goods and nondurable goods; Building material, hardware, garden supply, and mobile home dealers; General Merchandise stores; Food stores; Automotive dealers and gasoline service stations; apparel and accessory stores; Home furnishings, furnishings, and equipment stores; Eating and drinking places; Miscellaneous retail
Finance, Insurance, and Real Estate (FIRE)	Depository institutions; Nondepository credit institutions; Security and commodity brokers, dealers, exchanges, and services; Insurance carriers; Insurance agents, brokers, and services; Real estate; Holding and other investment offices, except trusts
Government	Financial administration, Other government administration, Judicial and legal, Police protection-

Government (continued)	officers, Corrections, Streets and highways, Water transport and terminals, Welfare, Health, Hospitals, Social insurance administration, Parks and recreation, Housing and community development, Natural resources, National defense, Postal service
Service Sector	Industries
Personal Services	Hotels, rooming houses, camps, and other lodging places; Laundry services; Photographic studios, portrait; Beauty shops; Barber shops; Shoe repair shops and shoeshine parlors; Funeral services and Crematories; Miscellaneous personal services (primarily tax return services, physical fitness services)
Business and Repair Services	Advertising agencies; Consumer credit and mercantile reporting agencies and adjustment and collection agencies; Mailing, reproduction, commercial art and photography, and stenographic services; Services to dwellings and other buildings; Miscellaneous equipment rental and leasing; Personnel supply services; Computer programming, data processing, and other computer related services; Miscellaneous business services (primarily security); Automotive repair, services, and parking; Miscellaneous repair services (electrical, watch, furniture)
Professional Services	Offices and clinics of doctors of medicine; Offices and clinics of dentists, Offices and clinics of osteopathy; Offices and clinics of other health practitioners; Nursing and personal care facilities; Hospitals; Medical and dental laboratories; Home health care; Miscellaneous health and allied services, not elsewhere classified (outpatient services, rehabilitation centers, blood banks); Offices of lawyers; Legal aid societies and similar legal services; Libraries; Vocational schools; Schools and education services, not elsewhere classified; Individual and family social services; Job training and vocational rehabilitation services; Child daycare services; Residential care; Social services, not elsewhere classified (community improvement, social change, and neighborhood development); Membership organizations; Engineering, architectural, and surveying services; Accounting, auditing, and bookkeeping services; Research, development; and testing services; Management and public relations services

I used multinomial logistic regression for my analysis. This is the appropriate technique when the dependent variable is categorical and the categories have no order. The dependent variable in my analyses is city membership in the category of stable, struggling, or devastated cities. There are 24 stable cities, 26 struggling cities, and 19 devastated cities, equaling 69 total cases. The independent variables are the change in the percent employed from 1970 to 2000 in each of the sectors identified in Table 3.1. I also control for the percent employed in each sector at the starting point of 1970 to separate the effects of initial size and change from 1970 to 2000 (see Galaskiewicz 1985; Freeman and Hannan 1975). Table 3.2 provides descriptive statistics on the independent and control variables.

Table 3.2: Variables and Descriptive Statistics

Variable	Mean	Std. Dev.
Independent Variables		
□ in % employed in Construction, 1970-2000	.759	.958
□ in % employed in Manufacturing, 1970-2000	-15.072	5.238
□ in % employed in Transportation, Communication, and Utilities, 1970-2000	.023	1.460
□ in % employed in Wholesale/Retail Trade, 1970-2000	2.046	1.662
□ in % employed in Finance, Insurance and Real Estate (FIRE), 1970-2000	1.582	1.365
□ in % employed in Business and Repair Services, 1970-2000	3.755	.567
□ in % employed in Personal Services, 1970-2000	2.552	1.298
□ in % employed in Professional Services, 1970-2000	6.205	4.657
□ in % employed in Public Administration, 1970-2000	-1.334	5.634
Control Variables		
% employed in Construction, 1970	5.007	.854
% employed in Manufacturing, 1970	35.582	8.347
% employed in Transportation, Communication, and Utilities, 1970	5.557	1.756
% employed in Wholesale and Retail Trade, 1970	18.937	1.664
% employed in FIRE, 1970	3.902	1.473
% employed in Business and Repair Services, 1970	2.198	.416
% employed in Personal Services, 1970	4.162	.527
% employed in Professional Services, 1970	17.763	5.360
% employed in Public Administration, 1970	4.065	2.403

I expected employment changes in some sectors to be highly correlated, which would be a problem for testing my hypotheses using regression analysis. I examined a correlation matrix of the variables and found a strong negative correlation between the starting point in manufacturing and the starting point in professional services. These variables could not be included in the same equation, making it difficult to determine the

individual effects of employment change in these sectors on city membership in a performance category. In an attempt to overcome this problem I first estimated a multinomial regression model with the employment starting point in manufacturing in 1970 and change in manufacturing from 1970 to 2000 as the only independent variables. I then estimated a second model with starting point and change in professional services as the only independent variables. Finally, I estimated a model with change in manufacturing and change in professional services as independent variables without controlling for the starting points in employment for these sectors. The results are presented below in Table 3.3. In all three models, membership in the stable performance category is the reference category. Therefore, the results in the "Struggling" column indicate how each independent variable affects the log likelihood of a city belonging in the struggling category versus the stable category. The results in the "Devastated" column indicate how each independent variable affects the log likelihood of a city belonging in the devastated category versus the stable category.

Table 3.3: MLR Results Comparing Effects of Manufacturing and Professional Services Change on City Membership in Performance Categories

	Model 1		Model 2		Model 3	
	Strug.	Dev.	Strug.	Dev.	Strug.	Dev.
% in Mfr 1970	-.042	-.002				
□ in Mfr 70-00	-.089	-.127			-.011	.194
% in Pro. Srv 1970			.141	.148		
□ in Pro. Srv. 70-00			.276	.710***	.065	.967**
LR Chi2	4.94		27.74		27.71	
Prob>Chi2	0.2936		0.0000		0.0000	
Pseudo R2	0.0328		0.1844		0.1842	
N	69		69		69	

*p ≤ .05, **p ≤ .01, ***p ≤ .001

Surprisingly, the results of these simple models indicate change in manufacturing does not have an effect on the likelihood a city belongs in a certain performance category. These results do not support hypothesis 1, which argued cities that experienced greater losses in manufacturing were more likely to be devastated. If this were the case, change in manufacturing employment would have a negative effect on "Devastated" in models 1 and 3. Instead, change in professional services affects the likelihood a city is devastated.

This finding was surprising, as a commonly accepted argument in the deindustrialization literature is that employment loss in manufacturing sends cities into a downward spiral. I decided to explore this finding further using a different statistical analysis. I conducted an exploratory factor analysis including city performance and the change in employment variables. I was hoping performance type (stable, struggling, or

devastated cities) would load into factors with percent change in employment in each sector from 1970 to 2000. The factors then, would serve as characterizations of how sectoral employment changed in cities in each performance category during the period of economic restructuring. Since the factor analysis would provide general portraits of economic change for each performance type, rather than separating the individual effects of each type of employment change on the likelihood a city was in a performance category, multicollinearity would not be a problem. The results are provided in Table 3.4 below. Only factors with eigenvalues greater than one were retained. I provide the un-rotated results, as these were more interpretable than the results after orthogonal rotation.

Table 3.4: Factor Analysis Results (Characterizations of Economic Change in Stable, Struggling, and Devastated Cities)

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Uniqueness
% □ construction	0.2900	0.2704	0.3651	-0.3417	0.5927
% □ manufacturing	-0.6442	-0.4721	-0.4785	-0.1713	0.1039
% □ trans./comm../utilities	0.0532	0.0733	0.2765	0.3282	0.8076
% □ wholesale/retail	0.3721	0.4390	0.2626	-0.3421	0.4829
% □ FIRE	-0.0690	0.2211	0.1005	0.1938	0.8987
% □ business/rep. services	0.0518	0.2553	0.3103	0.3854	0.6873
% □ personal services	-0.1735	0.0407	-0.0577	0.6341	0.5629
% □ professional services	0.8680	-0.0995	-0.0162	0.1209	0.2217
% □ government	-0.5827	-0.3142	0.1855	-0.3601	0.3977
Stable city	-0.4852	-0.4317	0.7286	0.0272	0.0466
devastated city	0.7479	-0.4137	-0.2355	0.1116	0.2016
struggling city	-0.2126	0.8056	-0.4991	0.0761	0.0509

As intended, the results of the factor analysis do provide portraits of the economic restructuring experiences of cities in each performance type. Factor 1 in Table 3.4

characterizes devastated cities and indicates that they experienced employment losses in manufacturing and the public sector with employment gains in wholesale and retail trade and professional services. Factor 2 characterizes struggling cities, which also experienced a loss in manufacturing employment and a gain in wholesale and retail trade. Factor 3 characterizes stable cities, which also lost employment in manufacturing, but gained employment in construction and business and repair services. Interestingly, while losses in manufacturing employment is a trend that occurs across performance types, it has the highest correlation to factor 1—the representation of devastated cities. This is consistent with the deindustrialization argument, and offers the evidence in support of hypothesis 1 that was expected. However, the high correlation of change in professional services to factor 1 stands out, clearly distinguishing devastated cities. Given these results, there is weak support for hypothesis 1, but the decline of manufacturing is not the complete story for cities in the devastated performance category; they also have experienced greater growth in professional services than struggling and stable cities. Taken together the results from Table 3.3 and Table 3.4 suggest that it is the increase in professional services employment that more clearly distinguishes the devastated cities.

After these attempts to isolate the individual effects of manufacturing and professional services, I proceeded with the multinomial logistic regression analysis. I estimated a series of models that included the remaining independent and control variables with the professional service variables. The first base model includes all of the variables relevant to my hypotheses and also the variables for construction employment. The remaining variables are introduced separately in successive models to avoid further

problems with multicollinearity. The results are provided in table 3.5. In this table, membership in the stable performance category is the reference category.

Table 3.5: MLR Results (Stable=Comparison Group)

	Model 1		Model 2		Model 3		Model 4	
	Strug.	Dev.	Strug.	Dev.	Strug.	Dev.	Strug.	Dev.
% in Prof.Srv. '70	.359*	.607*	.303	1.25**	.377*	.720**	.380*	.517
□ in Prof.Srv. 70-00	.670*	1.62***	.635*	2.23**	.686**	1.74***	.777**	1.77***
% in FIRE '70	.209	-.215	.177	.005	.235	-.650	.357	.014
□ in FIRE 70-00	.185	-.338	.744	-.858	.191	-.282	.126	-.316
% in Bus/Rp.Srv. '70	-2.10	-4.55*	-1.99	-4.76*	-2.55*	-5.04**	-2.26	-4.51**
□ in Bus/Rp.Srv, 70-00	-1.53	-4.82**	-1.51	-5.36***	-1.98*	-6.09***	-1.85*	-5.32***
% in Whl/Retail '70	.768*	.677	.801*	.601	.792*	1.11*	.876*	.828
□ in Whl/Retail 70-00	.741*	.509	.744*	.632	.713*	.799	.898*	.579
% in Construction '70	-.916	-1.30	-1.06	-1.28	-1.11	-1.89*	-1.15	-1.64*
□ in Construction 70-00	-.660	-.361	-.779	-.166	-.747	-.441	-.344	-.026
% in PersonalSrv. '70			.199	-2.60				
□ in PersonalSrv. 70-00			.188	-2.33				
% in Trn/Com/Util '70					.366	.154		
□ in Trn/Com/Util 70-00					.452	.697		
% in Government '70							.095	.300
□ in Government 70-00							.005	.325
LR Chi2	60.13		64.61		63.26		63.01	
Prob>Chi2	.0000		.0000		.0000		.0000	
Pseudo R2	.3997		.4294		.4205		.4188	
Number of cases	69		69		69		69	

*p ≤ .05, **p ≤. 01, ***p ≤ .001

The results in Table 3.5 do not explicitly indicate how employment trends may differ between struggling and devastated cities. For this comparison, the analysis was repeated, using strugling cities as the comparison group. The results are presented in Table 3.6. Since the employment differences between stable and struggling cities were identified in Table 3.5, only the results for devastated cities, as compared to struggling cities, are provided in table 3.6.

Table 3.6: MLR Results for Devastated Cities (Struggling Cities=Comparison Group)

	Model 1	Model 2	Model 3	Model 4
% in Professional Srv. '70	.248	.949	.342	.137
□ in Professional Srv. 70-00	.958*	1.59**	1.04*	.997*
% in FIRE '70	-.425	-.172	-.885	-.343
□ in FIRE 70-00	-.523	-1.05	-.473	-.442
% in Business/Repair Srv. '70	-2.44	-2.76	-2.49	-2.25
□ in Business/Repair Srv, 70-00	-3.29**	-3.86**	-4.11*	-3.47**
% in Wholesale/Retail '70	-.091	-.200	.316	-.047
□ in Wholesale/Retail 70-00	-.232	-.112	.085	-.318
% in Construction '70	-.384	-.227	-.781	-.495
□ in Construction 70-00	.299	.613	.306	.318
% in Personal Services '70		-2.80		
□ in Personal Services 70-00		-2.52		
% in Trans/Comm/Util '70			-.212	
□ in Trans/Comm/Util 70-00			.245	
% in Government '70				.205
□ in Government 70-00				.320

*p ≤ .05, **p ≤. 01, ***p ≤ .001

The results shown Tables 3.5 and 3.6 relate to hypotheses 2 through 5. Hypotheses 2 and 3 were related. Hypotheses 2 argued that cities that experienced employment gains in FIRE from 1970 to 2000 were more likely to be stable cities. Thus, change in FIRE would have a negative effect on the likelihood of a city being in the struggling or devastated category. Hypothesis 3 argues the greater the change in employment in business and repair services the more likely a city is a stable city. Similar to FIRE, change in this sector would have a negative effect on the likelihood a city is in the struggling or devastated category. If both of these hypotheses were supported, this would indicate stable cities were likely taking a high-end producer services path to adjust to the global economy.

The results in Table 3.5 only provide support for hypothesis 3. Increased employment in business and repair services clearly increases the likelihood a city is stable city in comparison to devastated cities. However, there is not as strong a distinction between stable and struggling cities. For struggling cities, the effect of employment change in this sector is in the right direction and nears significance at the.05 level in models 1 and 2, while reaching significance at the .05 level in models 3 and 4. This provides evidence in support of the hypothesis that cities with increased employment in business services are stable cities rather than struggling cities, but it is rather weak. Struggling cities also seem to have gained employment in some of these higher-end services. Interestingly, the results in Table 3.6 indicate that increased employment in business and repair services decreases the likelihood a city is devastated in comparison to struggling cities. This suggests cities in the struggling performance

category are gaining employment in this sector, but have not done so at the rate of stable cities. Overall, there is support for hypothesis 3, but increased employment in this sector also increases the likelihood a city is struggling rather than devastated.

Hypothesis 4 suggests that increased employment in wholesale and retail trade increases the likelihood a city is a devastated city. With this hypothesis I argue such a change indicates the presence of large, chain, retail stores or shopping malls and outlets—a low-end service path. There is no support for this hypothesis. Rather, the results indicate that gains in wholesale and retail employment increases the likelihood a city is a struggling city rather than a stable city. The results in Table 3.6 indicate that employment growth in this sector does not have a significant effect on the likelihood a city is a struggling performer in comparison to a devastated city. In sum, rather than finding support for hypothesis 4, it appears increased employment in wholesale and retail trade increases the likelihood a city is struggling in comparison to stable cities. However, increased employment in this sector does not distinguish struggling cities from devastated cities.

Hypothesis 5 argues that increased employment in professional services increases the likelihood a city is a struggling city. I expected professional services (employment in hospitals and social services) to act as a security net that saved cities from being in the devastated category. This too would be a low-end service route, but one that seemed likely to have better returns for a city than wholesale and retail trade. Therefore, this change in employment was expected to be found in struggling cities rather than devastated cities. This was not entirely the case. The results from Table 3.5 support

hypothesis 5, but the effect of change in professional services is stronger for devastated cities. When struggling cities are compared to devastated cities (Table 3.6) employment gains in professional services increases the likelihood a city is devastated. Thus, increased employment in professional services is more likely to be a path for devastated cities rather than struggling cities. This finding was also supported by the factor analysis.

In sum, I tested five hypotheses, and found support for two. While this is somewhat disappointing, the results of the analyses in this chapter are still very informative. The purpose of this chapter was to identify the employment trends that differentiate cities in each performance category. This objective was met despite the fact the results were not as expected. What these findings suggest for how cities in each performance category have transitioned to the post-industrial economy is further elaborated in the concluding section.

Conclusion

Perhaps the most interesting finding in this chapter is that the decline in manufacturing employment does not appear to be the only, or even most important, economic trend separating stable and devastated cities. Indeed, the results of the analysis in this chapter indicate the greater the loss of manufacturing employment, the more likely a city is devastated. However, this is only half of the story for the devastated performers. The different service-based paths cities have taken after deindustrialization are equally, if not more, important. The employment trend most strongly associated with devastated cities is not their manufacturing losses but rather their gains in the low-end professional services. Thus, the downward spiral argument emphasized in the deindustrialization

literature is incomplete. Devastated cities have not simply lost their manufacturing base. They have also followed a low-end service path based on increased employment in the professional services. Considering the industries that drive employment in this sector, it appears devastated cities are taking a hospital and social services path to adjust to the global economy.

On the other hand, stable cities have lost manufacturing employment but increased their employment in business services. I expected growth in business and repair services to compliment growth in FIRE in these cities, as producer services economies are recognized as agglomeration economies (Sassen 2001). However, the findings in this chapter indicate that only gains in business and repair services had a significant effect on the likelihood a city was a stable performer. Thus, the structure of the producer services economy in Rust Belt cities is likely to take on a different form than that described in the global cities literature. Table 3.1 lists the industries in this sector, but even with this list of industries it is unclear as to what employment growth in business services might look like in these cities. To clarify this finding, I tracked new business formations from 1980 to 2000 in several of the stable cities that showed growth in this sector.[11] The new employers mainly produced information for businesses and their clients. For example, Ross Laboratories opened a new facility in Columbus, Ohio, in 1993. Ross is a

[11] *Site Selection Handbook* is an annual publication that lists new investments in metropolitan and non-metropolitan areas by state. I used this publication to identify new employers in the Rust Belt cities that were classified in the business services sector (SIC 73). The products of the new facilities were always listed, but the actual SIC codes were only provided for select years. The establishments identified only by product were compared to those identified by SIC to ensure they produced similar services, and therefore, a part of the business services sector.

subsidiary of Abbott Laboratories and both companies manufacture nutritional and pharmaceutical products. The business services wing of Ross is responsible for providing information to healthcare professionals on all of their new products. It prepares research pamphlets and educational materials, organizes classes and conferences, and has a public affairs office. All e-commerce is also conducted through the Columbus facility. Other examples of business service employers that opened in other stable Rust Belt cities include:

- Compuserve: An early provider of internet services and email. It was once the largest consumer information services in the world. It was primarily involved in selling computer networking services to businesses.
- Xerox: While known as a producer of office equipment, Xerox also has a business services component, which focuses on printing and production support. It offers imaging, archiving, and retrieval services to healthcare, education, banking and finance industries.
- Harland: This company produces a variety of business services, including printing of all legal and professional forms for financial institutions; computer software systems for customer services, marketing, finance, and management departments; and Scantron data gathering services for businesses, educational institutions, and government.

Also included in the business services sector are publishers (McGraw Hill and Merrill) that print pamphlets for businesses, internet and computer security software providers, check printers (Paychex), and catalog services (including online). In sum, the employers

I identified in this sector offer hundreds of services that mostly center on the collection and reproduction of data/information and the distribution of this information. The stable cities in the Rust Belt region are following a producer services path that does not seem to include employment gains in FIRE. Thus, producer services in these cities appear to take a different form than that commonly recognized in the global cities literature. Instead of being coordination sites for international production and exchange, the Rust Belt cities appear to be major players in information production and data processing.

I believed struggling cities would be propped up by the growing healthcare economy, and therefore, they would be distinguished by employment gains in professional services. The findings in this chapter supported this hypothesis. However, as described above, increased employment in professional services had the strongest effect on the likelihood a city was devastated. Interestingly, increases in business services also increase the likelihood a city is a struggling city (when compared to devastated cities). Therefore, overall, struggling cities experienced greater gains in the high-end services (business and repair services) than devastated cities, but they also experienced greater gains in low-end services (professional services and wholesale and retail trade) than stable cities. With this mix of services, it makes sense they are struggling performers. They are interesting hybrids that demonstrate employment growth in both the low-end services that characterize devastated cities and the high-end services associated with stable cities.

In the next chapter, I take a closer look at these findings. In Chapter 2, I separated the Rust Belt cities into smaller groups of comparable cities. For example, there is a

group of medium-sized, industrial cities with a high concentration of manufacturing employment in the vulnerable metals-based industries that is of particular interest. The employment trends described in this chapter may differ in subtle but meaningful ways in the stable, struggling, and devastated cities in this group. The next chapter explores this possibility, reintroducing the groups of comparable cities to provide the most thorough account possible of economic transitions at the sector level in different types of Rust Belt cities.

CHAPTER 4: REASSESSING EMPLOYMENT TRENDS AND PERFORMANCE FOR CITIES IN DIFFERENT GROUPS

As mentioned in the beginning of the previous chapter, the lack of consistent longitudinal data at the industry level for MSAs is a hindrance to identifying specific economic transitions cities in the Rust Belt have made during the period of economic restructuring. As a result, I was only able to provide a general picture of these transitions using sector-level data and conventional quantitative methods. Yet, identifying specific transitions is a major goal of this research. To better meet this goal, in this chapter I reintroduce three of the groups of comparable cities from the classification system I developed in chapter 2. I use fuzzy set qualitative comparative analysis (QCA) to examine how changes in sector-level employment combine in the stable and devastated cities within each of these groups (Ragin 2000, 1987). By identifying combinations of employment change in different sectors, rather than the individual effects of sector-level employment change on the likelihood a city is a stable or devastated city, I refine the general picture of economic restructuring provided in the previous chapter.

The advantage provided by identifying combinations of employment change is that combinations better describe the type of local economy that exists within a city. For example, on its own, the positive effect of employment growth in business services on city membership into the stable performance category says little about the kind of local economy found in stable cities. However, this change combined with employment growth in other sectors, such as finance, insurance and real estate (FIRE) is more telling of the kind of local economy in a city. Employment growth in business services and

FIRE is a commonly used indicator for the presence of a producer services economy. My objective in this chapter is to use QCA to highlight the meaningful combinations of employment trends in stable and devastated cities. By uncovering these combinations, I describe the kinds of local economies that exist in certain cities. This allows me to better assess the specific paths Rust Belt cities have taken to adapt to the global economy. This does not mean I identify specific paths with certainty. Examining combinations of employment trends does not completely overcome the problems with sector-level data. However, I do indicate the most probable paths certain cities have followed.

There are four parts to this chapter. First, I reintroduce three of the groups that were created in Chapter 2. Each group contains cities that had a similar population size and manufacturing history in 1970, the starting point of the research. Group membership is likely to influence the economic transitions Rust Belt cities have made during the period of global economic restructuring. Therefore, I formulate new hypotheses for the combinations of employment change that are likely to be associated with the stable and devastated cities in each group. These hypotheses are not causal statements meant to test theory. My goal in this chapter is descriptive. Therefore, the new hypotheses are simply a general set of expectations for how employment trends are likely to combine in cities within each group. Importantly, I formulate new hypotheses only for stable and devastated cities. I do this because from this point forward, the dissertation will focus on cities that have clearly taken divergent paths.

In the second section of this chapter I detail the methods used to evaluate the new group-specific hypotheses. The bulk of this section focuses on my use of fuzzy set

qualitative comparative analysis. QCA is a method designed to assess the multiple ways causal conditions can combine to produce an outcome. It is also an appropriate method to use when analyzing a smaller number of cases. Thus, it is ideal for my purposes. To use this method I had to transform the variables I used in the last chapter into fuzzy sets. I begin this section with a detailed review of this process. Then, I provide a short review of how QCA identifies the different combinations of conditions associated with an outcome (i.e., the combinations of employment change in different sectors found in stable and devastated cities). Finally, since I only examine change in employment using QCA, I discuss how employment starting points can affect the QCA results and what I did to account for this.

In the third section I discuss the results. This is a lengthy section because I conducted separate analyses of the stable and devastated cities in each group, producing six different sets of results. I begin this section with a quick introduction on how to interpret the QCA results. Then, I review the findings for the stable cities, followed by a review for the devastated cities.

Finally, in the conclusion I condense the large quantity of information provided in the results section into a table. The table is a more concise presentation of the results. I use it to evaluate the hypotheses and to point out other interesting/unexpected findings.

Cities in Different Groups and Their Likely Paths over the Course of Global Economic Restructuring

In chapter 2, I identified seven groups of comparable cities in the Rust Belt region. The majority of cities fell into three main groups: Group 1, Group 4 and Group 5.

In this section, I reintroduce these three groups and provide hypotheses on how employment trends are likely to combine in their stable and devastated cities. The combinations suggest specific ways cities have reorganized their local economies to adapt to the global economy. I begin with the stable cities.

The results of the earlier quantitative analysis indicated employment growth in business services increases the likelihood a city is a member of the stable performance category. One specific path in which business services is a prominent component is a producer services path. As mentioned earlier, in the economic restructuring literature there is some debate regarding how this type of economy develops. Some scholars argue manufacturers are necessary for the development of a producer services economy (Markusen and Gwiasada 1993; Cohen and Zysman 1987). Others assert the development of this type of economy stems from the flight of manufacturing, which creates a demand for specialized services that assist corporate headquarters in the management of their geographically dispersed operations (Sassen 2000, 1991).

Really, these are two different types of economies. A city developing a producer services economy that accommodates the needs of a corporate headquarters is plugging into a network of high-level, multi-national firms. I call this a corporate-based producer services economy. Cities developing high end services around manufacturers can take two forms. In the Rust Belt, it is very unlikely an old automobile or steel factory has stayed in its original location and sparked the growth of a producer services economy around it. Instead, for high-end services to develop around manufacturing the manufacturing in a city has to be in products whose markets are expanding in the global

economy. Thus, a city can either be producing new products for new markets, such as bio-medical or computer-related products, which is a high tech production path, or producing old products that are suddenly in greater demand, such as plastics. The growth of manufacturing in expanding industries necessitates the growth of producer services. Separating the new high-tech production path from the expansion of old manufacturing is not possible analyzing sector-level data. Thus, both of these forms are included in what I call the manufacturing-based producer services path.

I believe the first type of producer services economy, the corporate-based producer services path, is most likely to be found in the stable cities in Group 1. These are medium-sized cities that had a strong manufacturing history in the vulnerable metals-based industries. There are fifteen of these cities, which are listed by their performance categories in Table 4.1 below.

Table 4.1: Group 1 Cities by Performance Category

Stable Cities	Struggling Cities	Devastated Cities
Grand Rapids, MI Indianapolis, IN Cincinnati, OH Columbus, OH Worcester, MA Akron, OH Allentown, PA	New Haven, CT Springfield, MA Dayton, OH	Toledo, OH Syracuse, NY Youngstown, OH Flint, MI Buffalo, NY

The cities in this group have always been home to a large number of corporate headquarters. In fact, more *Fortune 500* corporate headquarters were located in these cities in 1970, the starting point of global economic restructuring, and in 2000, the end point of the research, than in all the other cities in the study combined (*Fortune* 1969,

1999). The strong corporate presence in these cities should be a catalyst for producer services growth. Also, outside of the major metropolises, these are the largest cities in the region. Employers in the producer services tend to cluster in larger cities, especially since larger cities are more likely to have the amenities workers in the high-end services find appealing (Sassen 1991, 1990; Stephens and Holly 1980). Together, the strong corporate presence and the advantages of size make the stable cities in Group 1 the most likely to have followed a corporate-based producer services path. This would be reflected in the combination of employment trends described in Hypothesis 1.

> Hypothesis 1: Over the course of economic restructuring, the loss of manufacturing employment accompanied by growth in business and repair services and FIRE occurred in the stable cities in Group 1. (A corporate-based producer services path)

I believe the second type of producer services economy, the manufacturing-based producer services path, is most likely to be found in the stable cities in Group 4 and Group 5. The cities in Group 4 are smaller cities with a strong manufacturing history in the vulnerable metals-based industries. There are 32 of these cities listed by performance category in table 4.2 below.

Table 4.2: Group 4 Cities by Performance Category

Stable Cities	Struggling Cities	Devastated Cities
Ann Arbor, MI	Niles-Benton Harbor, MI	Mansfield, OH
Holland, MI	Muskegon, MI	Springfield, OH
Lancaster, PA	Reading, PA	Saginaw, MI
Columbus, IN	Rockford, IL	Erie, PA
York, PA	Michigan City, IN	Lima, OH
Bloomington, IN	Canton, OH	Elmira, NY
Elkhart, IN	Bay City, MI	Danville, IL
Jackson, MI	Battle Creek, MI	Muncie, IN
Kokomo, IN	Moline, IL	Utica, NY
Fort Wayne, IN	South Bend, IN	
Lansing, MI	Pittsfield, MA	
Kalamazoo, MI		

The cities in Group 5 are listed by performance category in Table 4.3 below. There are 13 of these smaller, manufacturing-based cities. Their manufacturing employment was not concentrated in the vulnerable metals.

Table 4.3: Group 5 Cities by Performance Category

Stable Cities	Struggling Cities	Devastated Cities
Evansville, IN	Anderson, IN	Binghamton, NY
Monroe, MI	Kankakee, IL	Decatur, IL
Norwich, CT	Peoria, IL	Johnstown, PA
	Terre Haute, IN	Steubenville, OH
	Altoona, PA	
	Williamsport, PA	

During the period of economic restructuring, not only was manufacturing moving from the Rust Belt to the South and out of the U.S. entirely, but within the region it was shifting from large cities to smaller cities. In particular, manufacturing was moving to

cities with a population of under 250,000 people (Glickman and Glasmeier 1989; Markusen 1987). The largest city in 1970 in both Groups 4 and 5 was Lansing, Michigan, which had a population slightly over 379,000 people (MSA). Thus, manufacturing was becoming increasingly concentrated in the cities in these two groups. The stable cities most likely relied upon their strong manufacturing sectors to adapt to the global economy.

Of the two forms of the manufacturing-based producer services economy, the expansion of old manufacturing is most likely to be found in the stable cities in these two groups. As manufacturing became increasingly concentrated into these cities, it is likely many of them acquired production facilities in industries whose products would be in greater demand in the global economy. The growth of new manufacturing in these cities is less likely, especially in Group 4. New manufacturing, such as the production of biomedical, computer, or telecommunications equipment, is clean manufacturing that is incompatible with Group 4's history in the polluting, metals-based industries. Conversely, the cities in Group 5 are clean cities that would be optimal sites for new manufacturing. Unfortunately, as mentioned earlier, I cannot identify these two different forms of manufacturing-based producer services economies with sector-level data. Both forms would reflect the combination of employment trend described in Hypothesis 2.

> Hypothesis 2: Over the course of economic restructuring, employment growth (or retention) in manufacturing accompanied by growth in business and repair

services and FIRE occurred in the stable cities in Group 4 and 5. (A manufacturing-based producer services path)

While the movement of manufacturing into smaller cities could have been a resource to build upon for cities in Group 4 and Group5, it is also likely the stable cities in these groups have simply survived deindustrialization. In other words, they were able to retain their old manufacturing and continue to be production centers (i.e., branch locations for large manufacturers, like GM), while the devastated cities experienced a more severe phase of deindustrialization. I expect this to be more common in the stable cities in Group 4. Their history in metals-based production makes them more vulnerable to manufacturing flight. Their manufacturing history also makes them attractive sites for foreign transplants. After all, if transplants locate in this region, they often locate where there is an already available manufacturing infrastructure (Perucci 1994). The cities in Group 4 have such an infrastructure. Therefore, maintaining old manufacturing or attracting a transplant is another likely path for stable cities in Group 4. I expect these cities to show retention or employment growth in manufacturing in combination with an absence of growth in all other sectors, except perhaps, wholesale/retail.[12]

Hypothesis 3: Over the course of economic restructuring, employment growth (or retention) in manufacturing accompanied by employment growth in

[12] Bluestone and Harrison (1982) show there is a strong link between a healthy wholesale/retail sector and a strong manufacturing sector. Therefore, I assume this sector will rise and fall with manufacturing. This is why I predict employment growth in wholesale/retail with a strong manufacturing sector.

wholesale/retail and an absence of growth in all other sectors occurred in the stable cities in Group 4. (A manufacturing path)

The results of the earlier regression analysis showed employment growth in professional services increases the likelihood a city is a devastated city. After examining the industries that compose this sector and recognizing that hospitals have been cited as a security net for displaced manufacturing workers in larger cities (Wilson 1994), I concluded employment growth in professional services is an indicator of a healthcare-based path into the global economy. I expect employment growth in professional services to be characteristic of the local economies of all devastated cities. If employment in this sector combines with growth in any other sector, I expect it to combine with the other low-end services—wholesale/retail or personal services. I do not expect to find high-end service growth in any of the devastated cities. Thus, Hypothesis 4 follows.

Hypothesis 4: Over the course of economic restructuring, employment growth in professional services combined with employment growth in wholesale/retail and/or personal services occurred in the devastated cities in Groups 1, 4, and 5. (A healthcare-based path)

If the paths for the devastated cities do differ at all, the loss of manufacturing employment is likely to figure more prominently for devastated cities in Group 4 and

Group 5. As explained above, the life or death of cities in these two groups is likely to hinge on the retention of manufacturing employment, especially for cities in Group 4. If this is the case, a key component of the local economies of both stable and devastated cities in Group 1 will be manufacturing loss. On the other hand, a key component of the local economies of stable cities in Groups 4 and 5 will be retention or gains in manufacturing employment, while the devastated cities in these groups will show local economies characterized by manufacturing loss.

> Hypothesis 5: Manufacturing loss will be a key component of the local economies in both stable and devastated cities in Group 1. Manufacturing loss will be a key component of the local economies only in the devastated cities in Groups 4 and 5.

Methods

I use the same sector-level employment data in this chapter that were used in Chapter 3, but I had to alter these data to be compatible with fuzzy set qualitative comparative analysis (QCA) (Ragin 2000). To use this method I had to first convert the dependent variable used in the previous chapter, a city's membership into a performance category, into fuzzy sets measuring each city's degree of membership into the set of stable and devastated cities.[13] In the analysis, these serve as my outcomes of interest.

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[13] Since I provide a review of fuzzy sets in Chapter 2, where they were used to define the different groups of comparable cities in the Rust Belt, I do not repeat this information here. If needed, the review is on pages 33-37.

Creating these sets was straightforward for Group 1 and Group 5. The boundaries between performance categories for these two groups are well defined, meaning there are clear differences in how cities performed on the quality of life index developed in Chapter 2. Stable cities clearly performed better than struggling cities and struggling cities clearly performed better than devastated cities. Additionally, there is little variation in performance on the quality of life index between cities within each category. Therefore, to develop the fuzzy set for stable outcomes I used a simple three-value scale. Stable cities received a score of "1," denoting full membership into the set of stable cities. Struggling cities received a membership score of ".5," meaning their membership into the set of stable cities is ambiguous, and finally, the devastated cities received a score of "0," indicating they are fully out of the set of stable cities. By negating this set, I developed the fuzzy set for membership into devastated cities: negation = 1 - the fuzzy score for membership into the set of stable cities.

Developing the fuzzy sets for the outcomes for Group 4 was more difficult. The boundary between the struggling and devastated categories was not problematic; all devastated cities performed poorly on the quality of life index and were clearly different than struggling cities. Consequently, devastated cities received a membership score of "0" into the set of stable cities. The boundary between stable cities and struggling cities was less clear. In Table 4.2 the cities are listed in their performance category according to how well they scored on the quality of life index. So, in the stable category Ann Arbor is the best performer while Kalamazoo is the worst performer. Similarly, Niles-Benton Harbor was the best performing struggling city while Pittsfield was the worst. The

differences in performance on the quality of life index between the stable cities listed below Jackson, Michigan, and the struggling cities of Niles-Benton Harbor and Muskegon is not completely clear. In addition, there is quite a bit of variation in performance on the quality of life index amongst the cities ranked between Niles Benton Harbor and Pittsfield. Due to the lack of a distinct boundary between the worst of the stable cities and the best of the struggling cities and the variation in city performance between the struggling cities, I thought the use of a three-value fuzzy set would be an inaccurate qualitative description of membership into the set of stable cities. After carefully re-examining how these cities performed on the quality of life index, I opted to use a six-value scale. Table 4.4 is a reproduction of Table 4.2, but I have included each city's membership scores into the fuzzy set of stable cities. Once again, the negation of the fuzzy set for stable cities produced the fuzzy set for devastated cities.

Table 4.4: Group 4 Cities by Performance Category (Membership Scores into the Fuzzy Set of Stable Cities)

Stable Cities	Struggling Cities	Devastated Cities
Ann Arbor, MI (1)	Niles-Benton Harbor, MI (.6)	Mansfield, OH (0)
Holland, MI (1)	Muskegon, MI (.6)	Springfield, OH (0)
Lancaster, PA (1)	Reading, PA (.6)	Saginaw, MI (0)
Columbus, IN (1)	Rockford, IL (.6)	Erie, PA (0)
York, PA (1)	Michigan City, IN (.4)	Lima, OH (0)
Bloomington, IN (1)	Canton, OH (.4)	Elmira, NY (0)
Elkhart, IN (1)	Bay City, MI (.4)	Danville, IL (0)
Jackson, MI (1)	Battle Creek, MI (.4)	Muncie, IN (0)
Kokomo, IN (.8)	Moline, IL (.2)	Utica, NY (0)
Fort Wayne, IN (.8)	South Bend, IN (.2)	
Lansing, MI (.8)	Pittsfield, MA (.2)	
Kalamazoo, MI (.8)		

Once I created the fuzzy sets for my outcomes of interest, I had to convert the interval-scale employment variables from the previous chapter into fuzzy sets. I did this for all of the change in employment variables except for construction; transportation, communications, and utilities; and government. These variables did not have a significant effect on city performance in the earlier regression analysis, and I was primarily interested in how employment change in manufacturing and the services combined in stable and devastated cities. I also did not develop fuzzy sets for employment starting point in 1970, as I had to limit the number of causal conditions included in the analysis. However, I do consider employment starting points and end points to verify the results of the analysis.

To transform the change in employment variables into fuzzy sets I followed Ragin's calibration procedure (2007). The first step in this procedure is to identify the range of scores on an interval-scale variable that separate cases that are fully in a set from those that are mostly in, mostly out, or fully out. Ideally, in this first step the researcher draws heavily upon substantive and theoretical knowledge to identify agreed upon standards that are used to demarcate these qualitative differences. Existing literature on my research provides no known standards for the levels of change in employment that indicate whether a city is fully in or fully out of a set of personal service-based, professional service-based or wholesale/retail-based cities. To develop such standards, I started by defining the range of scores between which a city is neither in nor out of these sets—the zones of maximum ambiguity. For these three sectors, I defined this zone as the range of scores between the average change in employment from 1970 to 2000 for all

MSAs in the United States and the average change in employment for the cities within each group. I then looked for reasonable breaks in the change in employment scores above and below this zone to define the other qualitative categories. After continually re-evaluating and adjusting the coding scheme, I ended up with six qualitative categories for each of these three sectors. These categories are listed below with their associated numerical values:

- Fully in the set (4)
- Probably in the set (2)
- More in than out of the set (.5)
- More out than in the set (-.5)
- Probably out of the set (-2)
- Out of the set (-4)

While the zone of maximum ambiguity discussed above suggests I should have a definite middle point, and therefore, an odd number of qualitative categories, I decided to divide this range of scores in half to create the two middle categories (more in than out, more out than in).

The numerical values for the qualitative categories listed above (4, 2, .5, -.5, -2, -4) are estimates of the log of the odds of full membership in the sets of personal service-based, professional service-based, and wholesale/retail-based cities. In the next step of the calibration procedure I used these values as the dependent variable in three linear regression analyses (one for each sector) using all 60 cities. The independent variables were the actual change in employment scores. The resulting predicted values from these

regressions were the log odds of membership into the sets based on their actual employment change and numerical values attached to the qualitative categories. By exponentiating these into simple odds I was finally able to assign degree of membership scores into the fuzzy sets for personal service-based, professional service-based and wholesale/retail based cities. The formula for membership scores is given below: Degree of membership = (odds of membership) / (1+odds of membership)

I use Kalamazoo, Michigan, as an example to clarify this process. Kalamazoo's change score in wholesale/retail employment was above the average change for all MSAs in the United States. However, it was below the average for all the cities in Groups 1, 4, and 5. Thus, Kalamazoo is in the zone of maximum ambiguity. When I divided this zone in half, Kalamazoo was in the upper half of this zone. It was more in than out of the set. Thus, it received a score of .5, which is an estimate of this city's log of the odds of full membership in the set of wholesale-retail-based cities. After the regression procedure described above, it received a degree of membership score of .55.

The literature on deindustrialization and economic restructuring provides clearer standards for city membership into sets of manufacturing, business service-based, and FIRE-based cities. For the fuzzy set of manufacturing cities, I started by identifying the range of scores that fully exclude cities from the set. In the deindustrialization literature, cities that lost at least 20 percent of their employment in manufacturing, such as Cleveland, Pittsburgh, Buffalo, and Youngstown, are frequently cited as severely deindustrialized cities (Crandall 2002; Pappas 1989; Goldman 1983). I used this benchmark to denote cities that were fully out of the set. I used the same criteria above,

splitting the range of scores between the average change in manufacturing employment for all MSAs in the United States and the average change in manufacturing employment for the cities in each group, to define the middle categories (more out than in, more in than out). Cities that had gained employment from 1970 to 2000 had full membership into the set of manufacturing cities. The other qualitative categories were assigned by examining breaks in the change scores. In total there were six qualitative categories for this set. Finally, I followed the calibration procedure described above to assign the degree of membership scores and complete the fuzzy set for manufacturing cities.

To create the final two fuzzy sets I started by defining the standards for full inclusion. I used producer services cities commonly recognized in the global cities literature to develop this benchmark. New York, Chicago, Los Angeles, Washington D.C., Boston and San Francisco had, on average, a 4.4 percentage point increase in business services employment and a 2.5 percentage point increase in FIRE from 1970 to 2000. These became my standards for full inclusion into these two sets. Once again, the same criteria I used to make the other fuzzy sets were used for the middle categories, and breaks in the change scores were used to define the range of scores delineating the other qualitative categories. Both of these fuzzy sets had six qualitative categories as well. The calibration procedure using linear regression was then followed to develop and assign final membership scores into these two sets.

Once I constructed all of the fuzzy sets for employment change (my causal conditions in the analysis), I was ready to identify how they combined with the fuzzy sets for stable and devastated cities (the outcomes in the analysis). In QCA, truth tables are

constructed to achieve this end. In a truth table, cases are arranged according to the presence and absence of causal conditions. The researcher identifies cases that share causal conditions and also agree on the outcome of interest. Following the principles of set algebra the researcher reduces the causal combinations to provide a solution to the truth table that identifies the "prime implicants" associated with the outcome of interest (Ragin 1987: 95-98).

This is a simple procedure when using "crisp sets." When fuzzy sets are used all cases can display unique combinations of membership scores into the causal conditions, and agreement on the outcome can vary. This complicates the procedure. Ragin (2005) outlines how these problems can be circumvented. He describes how fuzzy algebra can be used to assess fuzzy subset relations and how the rows of truth tables can be interpreted as descriptions of corners of a multi-dimensional vector space created by the intersection of the fuzzy sets.[14] Following the procedures detailed by Ragin, I developed six fuzzy set truth tables using fs/QCA—one for stable outcomes and one for devastated outcomes for each group of cities.[15]

To solve these truth tables (i.e., identify the combinations of employment trends connected to stable and devastated cities in each group), I had to define frequency and consistency thresholds. Frequency is the number of cases that adhere to the causal combinations in a row of the truth table (a corner of the vector space). A frequency

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[14] For a more detailed description of how truth tables are constructed using fuzzy sets, see Ragin (2005: 6-12). For a description of multi-dimensional vector spaces, see chapter 2, pages 43-45, or Ragin (2000).

[15] Fs/QCA is the software program developed by Charles Ragin for qualitative comparative analysis using both crisp and fuzzy sets (Ragin, Drass and Davey 2006).

threshold then, is the minimum number of cases necessary to classify a row, or combination of causal conditions, as relevant to the outcome of interest. The frequency threshold I used was one case. Consistency is the proportion of the sum of membership scores that are consistent with the set relation (outcome) of interest. A consistency of 1.0 indicates the entire sum of membership scores is consistent with the outcome. Perfect consistency is rare and the general rule in QCA is a consistency score equal to, or greater than, 0.8. I followed this general rule.

Once I obtained the solutions to the truth tables (i.e., descriptions of the employment trends most relevant to stable and devastated outcomes), I examined the employment starting points and end points in each sector to verify the results. Only employment change scores were incorporated into the fuzzy sets, but change can have a different meaning for cities depending on starting point. For example, if two cities lost a lot of manufacturing employment from 1970 to 2000, but one city had a much higher percent of the labor force concentrated in manufacturing in 1970 than the other, despite its losses, the city with the higher starting point in manufacturing could still be a manufacturing-based city in 2000. The other city would not be. These differences would not be captured in the QCA results.

To check for these differences and how they may have affected the results, I first examined the data to identify the cities that were the strongest empirical instances of the QCA solution. I compared the employment starting points of these cities to make sure they experienced the employment changes similarly. If not, I noted these differences. Then, I examined the data to identify the cities that were not good empirical instances of

any of the QCA solutions. I checked to see if their lack of conformity to a QCA solution was due to the starting point problem. If not, I examined their employment trends to determine the structure of their local economy to see if it implied a specific path they have taken from 1970 to 2000.

Overall, this was a process in which I moved back and forth between the QCA results and the data. The QCA results served as a starting point by identifying patterns in the data I should examine first. From there, I tried to clarify how these patterns may have been experienced differently, as determined by employment starting points. I also accounted for the combinations of employment trends in cities that did not conform to these patterns. By the end of this process, I had identified the different combinations of employment trends in all stable and devastated cities in each group. These combinations suggest the specific path each city has likely taken to adapt to the global economy and find a new economic niche.

Results

In this section I follow a consistent format in presenting the results. I begin with the stable cities. For each group I first present and discuss the QCA results, identifying the cities that most closely follow them. Second, I detail how, if at all, these results were affected by employment starting points. Next, I describe the combinations of employment trends in the cities that did not closely follow the QCA results. Finally, I provide a brief summary of the combinations of employment change found in each city and discuss what they mean for my hypotheses. I then repeat this format for the

devastated cities. However, before I do this, it is necessary I provide some background information on how to interpret the QCA results.

In the tables below, three different types of truth table solutions are provided. Since QCA is a method designed specifically to reveal multiple, combinatorial solutions to an outcome of interest, a complex solution is provided first. I am especially interested in these, as my objective in this chapter is to describe the different paths cities have taken over the course of economic restructuring. By incorporating simplifying assumptions into the analysis, intermediate and simple solutions are provided as well (see Ragin and Sonnett 2004). These solutions indicate the causal conditions most relevant to the outcome of interest. These solutions provide additional evidence for my hypotheses, but again, I focus primarily on the complex solutions. Importantly, none of these solutions should be recognized as the correct solution. Rather, they should be interpreted as the range of paths to the outcome that exist along a complexity/parsimony continuum.

The results are presented in QCA notation, where a plus sign indicates logical *or* and an asterisk indicates logical *and.*[16] All capital letters indicate the presence of a condition and all lower case letters indicate the absence of a condition. In the tables below, I use abbreviations for the conditions, but they should be easy to interpret. Still, I provide a key to the abbreviations under the first results table.

In the tables, consistency and coverage scores are provided for each term in a solution. As mentioned above, consistency is the proportion of the sum of membership scores that are consistent with the set relation in question (combinations of employment

[16] The difference between these logical operators was discussed in Chapter 2. Additionally, a review of how they are used in QCA is available in Ragin (1987: 89-92).

and city performance). Consistency scores are used to answer the following question: Does a certain combination of conditions reliably produce the outcome of interest? Raw coverage is the proportion of the sum of the membership scores in the outcome (stable or devastated) that can be accounted for using membership in the causal combination (combinations of employment change). Importantly, causal combinations can overlap and this is not captured in the raw coverage score. This is why a unique coverage score is also provided. Unique coverage is the proportion of the sum of the membership scores in the outcome that are accounted for exclusively using membership in the cusal combination. Essentially, coverage is similar to variance explained. It assesses the proportion of cases showing the outcome that are explained by each causal combination. Coverage scores are used to answer the following question: How much of an outcome is accounted for by a particular combination of conditions?[17]

I now turn my attention to the findings. I begin with Table 4.5, which shows the fuzzy set QCA results for stable cities in Group 1. In Hypothesis 1, I argued the combination of employment loss in manufacturing with employment growth in business services and FIRE to be a common path for stable cities in this group. This combination of employment changes suggests a corporate-based producer services path into the global economy. This hypothesis would be confirmed if the combination "mfr*FIRE*BUSRV" appears in the QCA results. These results are also relevant to hypothesis 5, in which I argued the loss of manufacturing employment is likely to be a key condition in the paths

[17] These scores identify the solutions most relevant to the outcome, but when I analyze employment starting points, the relevance of a solution might change. This affects these scores. See Ragin (2006) for a more detailed discussion of consistency and coverage scores.

of stable cities in this group. Support for this hypothesis would be provided if "mfr" appears in the results.

Table 4.5: FS QCA Results for Cities in Group 1-Stable Outcomes

Solution Type	Solution Terms	Raw Coverage	Unique Coverage	Consistency
Complex Solution	mfr*FIRE*BUSRV*prosv	0.481708	0.411691	0.976714
	+ MFR*whret*fire*busrv*persv*prosv	0.131564	0.077268	0.933103
	+ mfr*whret*fire*busrv*PERSV*prosv	0.123177	0.048875	0.914931
Intermediate Solution	whret*prosv+	0.443543	0.151439	0.974829
	FIRE*BUSRV*prosv	0.507497	0.215392	0.977871
Simple Solution	Prosv	0.678931	0.678931	0.980498

Abbreviations Key: mfr=manufacturing; whret=wholesale/retail; fire=finance, insurance and real estate; busrv=business and repair services; persv=personal services; prosv=professional services.

The results provide support for Hypothesis 1. Employment loss in manufacturing and growth in FIRE and business services combine in the first term of the complex solution. The consistency score for this solution term is very high, suggesting a very strong relationship between this combination of conditions and stable performance. The coverage scores are also very high. Nearly half of the sum of membership scores in the outcome, as indicated by the raw coverage score of .48, follows this solution.

Employment loss in manufacturing is not a major causal condition in the second term of the intermediate solution, but the combination of employment growth in FIRE and business services is. Again, the consistency and coverage scores are high. These two terms provide very strong evidence that stable cities follow a corporate-based producer services path into the global economy. Examining the data, Akron, Ohio; Allentown, Pennsylvania; and Columbus, Ohio, are the best examples of cities following this solution. Worcester, Massachusetts, also follows this solution but has weaker membership into the set of business services-based cities.

The results also provide initial support for hypothesis five. The loss of manufacturing employment is a key condition in the first and third solution terms of the complex solution. However, the second solution term indicates the presence of manufacturing and the absence of services is consistent with a stable outcome. This path does not support hypothesis 5, but the coverage scores accompanying this term are very low, suggesting not many stable cities follow this path. Thus, employment growth or retention of employment in manufacturing is not very relevant to stable cities in this group, except for perhaps a couple of cases. Examining the data, manufacturing is retained in Grand Rapids, Michigan, which is the best example of a city following the second term in the complex solution.

When I examined employment starting points it was clear the change trends described in the QCA results were not entirely accurate descriptions of the changes these cities experienced. The starting points in manufacturing were a problem for Akron, Ohio; Allentown, Pennsylvania; Flint, Michigan; and Youngstown, Ohio. These cities

had very high starting points in manufacturing. Therefore, despite substantial losses in employment over the course of economic restructuring, they remain manufacturing-based cities. How this effects Flint and Youngstown will be discussed later. For Akron and Allentown, these cities are developing high-end service sectors, as the results suggest, but manufacturing may be playing a role in the development of these sectors. Thus, it is not certain they are following a corporate-based producer services path. They could just as well be following a manufacturing-based producer services path.

The employment starting points in the service sectors were a problem for Indianapolis, Indiana; Cincinnati and Youngstown, Ohio; and Grand Rapids and Flint, Michigan. Again, Youngstown and Flint will be discussed later. Indianapolis had one of the slower rates of change in FIRE, but it had a very high starting point. As a result, its membership into the set of FIRE based cities is ambiguous (near .5). Yet, Indianapolis had substantially more employment concentrated in this sector in 2000 than any other city in this group. Therefore, despite sluggish growth, it is a FIRE-based city. Taking this into consideration and examining its other employment trends, Indianapolis is a good example of a city following a corporate-based producer services route.

Cincinnati had a similar problem with its membership score into the set of business services cities. It had a very high starting point in this sector but a sluggish rate of change. The slow rate of change produced a low membership score into this set when Cincinnati is indeed a business services-based city. It is very similar to Indianapolis and also appears to be following a corporate-based producer services route.

Employment starting points were less of a problem for Grand Rapids, but I thought it noteworthy this city had somewhat high starting points in both of the high-end service sectors. It experienced slow change, but it is probably more of a FIRE-based and business-services based city than its membership scores indicate. Thus, Grand Rapids can either be a manufacturing city, as the second term of the complex solution suggests, or it could have followed a manufacturing-based producer services path.

In combination, the QCA results and the adjustments made to them when employment starting points were analyzed provide insight into how the local economies in stable cities in Group 1 changed over the period of global economic restructuring. I expected these cities to follow a corporate-based producer services path into the global economy. It is almost certain four of the stable cities followed this path, confirming hypothesis 1. However, there are differences in how these cities took this path. Indianapolis, Indiana, and Cincinnati, Ohio, lost their manufacturing but they had strong, early foundations in the high-end services. On the other hand, Worcester, Massachusetts, and Columbus, Ohio, are cities that lost manufacturing and then built up their high-end service sectors from low starting points. It is likely Allentown, Pennsylvania, and Akron, Ohio, have also followed this path, but these cities still have quite a bit of employment concentrated in manufacturing. Therefore, it is uncertain as to how their high-end services are growing. These cities can be taking either a corporate-based producer services route or a manufacturing-based producer services route. Finally, one stable city from this group, Grand Rapids, maintained a manufacturing path. It has not experienced notable growth in the services, but it had relatively high starting points in FIRE and

business services. Therefore, even with sluggish growth rates, these sectors are fairly well developed in this city. This suggests Grand Rapids could also have followed a manufacturing-based producer services path.

In the analysis of Group 4, I decided to exclude Ann Arbor and Lansing, Michigan, and Bloomington, Indiana. According to the classification system developed in chapter 2, these cities have the lowest membership scores into this group, but more importantly, as homes to large, research-based universities, the path these cities are taking into the global economy is obvious. They are educational centers, and as such, they are much different from the other cities in this group. It was appropriate to remove them from the analysis.

In Hypothesis 2, I argued the stable cities in Group 4 were likely to follow a manufacturing-based producer services path. If they followed this path, the combination of "MFR*FIRE*BUSRV" would appear in the QCA results. In hypothesis 3, I argued it was also likely stable cities in Group 4 simply maintained manufacturing. The combination of "MFR*WHRET" in the results would indicate some of these cities took a manufacturing path into the global economy. Finally, the results for stable cities in this group are also relevant to Hypothesis 5. The presence of "MFR" in the solution terms, regardless of how it combined with other types of employment, would provide support for this hypothesis. The QCA results are provided in Table 4.6 below.

Table 4.6: FS QCA Results for Cities in Group 4-Stable Outcomes

Solution Type	Solution Terms	Raw Coverage	Unique Coverage	Consistency
Complex Solution	MFR*fire*busrv* persv*prosv	0.325370	0.048169	0.813764
	+ MFR*WHRET*fire* busrv*persv	0.351651	0.064593	0.810475
	+ mfr*whret*fire*BUSRV* persv*PROSV	0.271655	0.096209	0.807027
Intermediate Solution	whret*fire*BUSRV*persv	0.285458	0.085204	0.800610
	+ MFR*fire*busrv*persv* prosv	0.325370	0.069374	0.813764
	+ MFR*WHRET*fire*persv* PROSV	0.348863	0.064593	0.796653
Simple Solution	busrv*prosv+	0.396950	0.066787	0.775150
	MFR*WHRET*fire*busrv+	0.366686	0.059408	0.816822
	whret*fire*BUSRV*persv+	0.285458	0.006856	0.800610
	mfr*fire*BUSRV*persv+	0.327649	0.000000	0.771808
	fire*BUSRV*persv*PROSV	0.361231	0.000000	0.788536

The results do not support Hypothesis 2. None of the solution terms combine manufacturing employment with employment growth in FIRE and business services. On the other hand, there is clear support for Hypothesis 3. The combination of employment growth in manufacturing and wholesale/retail appears in the second term of the complex solution. The unique coverage for this term is rather low (.06), but this is likely due to overlap with the first term in the complex solution. The second term of the simple solution also identifies this combination, with an absence of FIRE and business services,

as consistent with the outcome. Over 30 percent of the sum of membership scores is consistent with this solution. Examining the data, the strongest empirical instances of this solution are Columbus, Indiana, and Holland and Kalamazoo, Michigan.

The results also provide evidence in support of hypothesis 5. The presence of manufacturing in QCA results suggests maintaining manufacturing is more important to stable cities in this group than stable cities in Group 1. Even though Grand Rapids, Akron, and Allentown were identified as manufacturing cities in Group 1 a healthy manufacturing sector appears to be more important to the stable cities in Group 4. In addition to the three previously mentioned Group 4 cities, Elkhart and Fort Wayne, Indiana, and Jackson, Michigan, are manufacturing-based stable cities that closely follow the first term of the complex solution.

I did not expect the combination of business services with professional services in the results. When I examined the data to determine the cities following the last term of the complex solution, I found the best empirical instances to be those cities that straddled the border between stable and struggling cities (i.e., those with a .6 membership in the set of stable cities). These cities include Niles-Benton Harbor, Michigan; Rockford, Illinois; and Reading, Pennsylvania. This reflects the results of the regression analysis, which showed struggling cities experienced employment growth in business services and professional services. It is not clear what this combination of employment implies for a specific path these cities have taken.

When I examined the employment starting points for the cities in this group there were some obvious instances in which cities had been misclassified based on their change

scores. In manufacturing, the following cities had membership scores that were too low: Kokomo, Indiana; York and Erie, Pennsylvania; Muskegon, Michigan; and Mansfield, Ohio. Accounting for the starting points of the stable cities, Kokomo is a solid example of a city combining employment in manufacturing and wholesale/retail, providing additional support for Hypothesis 3. York becomes an interesting case, as it has high membership in the set of business services-based and FIRE-based cities. York clearly follows a manufacturing-based producer services path, providing support for Hypothesis 2 that was not evident in the QCA results.

Examining starting points in the services, Columbus, Indiana, had a membership score in the set of business services cities that was too low. Fort Wayne, Indiana, and Lancaster, Pennsylvania, had high starting points in business services and FIRE but low change scores. Therefore, their membership scores in these sectors were too low as well. Accounting for these problems, Columbus and Fort Wayne are similar to York, but they have not experienced the same amount of employment growth in the high-end services. Still, they provide support for Hypothesis 2. Some of the stable cities in Group 4 are likely to have taken a manufacturing-based producer services path.

Lancaster is an odd case. It combines employment growth in the high-end services with growth in wholesale/retail and personal services. This combination of employment trends can reflect a tourism-based path or Lancaster may simply be a college town. The college cities that were excluded from this group showed similar employment trends.

Besides the cities discussed above, employment starting point was also a problem for Erie, Pennsylvania. This city had a high starting point in business services that was not accounted for by its sluggish rate of change. It is more of a business services-based city than its membership score into this set indicates. Similarly, the membership score in the set of personal services-based cities is too low for Lima, Ohio. How these scores affect the results for these cities will be discussed when the devastated cities from Group 4 are discussed below.

Summing up the results for stable cities in Group 4, manufacturing is a very important condition in their local economies, which supports hypotheses 3 and 5. Holland and Kalamazoo, Michigan, and Kokomo, Indiana, are cities that combined retention or growth in manufacturing employment with growth in the wholesale/retail sector. Elkhart, Indiana, and Jackson, Michigan, also retained or expanded their manufacturing sectors but in the absence of growth in all other sectors. These five cities have taken pure manufacturing-based paths over the course of economic restructuring and are likely sites for foreign transplants. These cities support hypothesis 3.

Fort Wayne and Columbus, Indiana, have retained their manufacturing but they also built upon well developed service sectors that the other manufacturing cities do not have. Their path parallels that of Grand Rapids from Group 1. They either followed a manufacturing path or a manufacturing-based producer services path. York, Pennsylvania, also has a strong manufacturing sector but it has experienced growth in what used to be weak high-end service sectors. York appears to be following a manufacturing-based producer services path. These cities provide weak support for

Hypothesis 2, as it is not as clear Fort Wayne and Columbus have followed manufacturing-based producer services paths.

Lancaster, Pennsylvania, was the only city in this group with a weak manufacturing sector. It experienced employment loss in manufacturing, employment growth in the high-end services, and growth in wholesale/retail and personal services. This could reflect a tourism-based path, or, similar to those cities excluded from the analysis, Lancaster is another college city.

The results for stable cities in Group 5 are shown in Table 4.7. For these cities I again expected manufacturing to be an important. More specifically, following Hypothesis 2, I argued these cities would experience employment growth or retention in manufacturing combined with high-end service sector growth. I believed this to be a likely path for these cities because of their history in cleaner manufacturing. They are likely more attractive sites for the location of new manufacturing and services. The combination of "MFR*FIRE*BUSRV" in the QCA results would support Hypothesis 2. Additionally, these results relate to hypothesis 5, in which I argued manufacturing matters more to the stable cities in Groups 4 and 5 than to those in Group 1. The presence of "MFR" in the results would provide support for this hypothesis.

Table 4.7: FS QCA Results for Cities in Group 5-Stable Outcomes

Solution Type	Solution Terms	Raw Coverage	Unique Coverage	Consistency
Complex Solution	mfr*whret*fire*BUSRV* PERSV*prosv	0.222552	0.133174	0.868958
	+ MFR*whret*FIRE* BUSRV*persv*PROSV	0.196951	0.107573	0.836187
Intermediate Solution	whret*fire*BUSRV*prosv	0.222552	0.119425	0.868958
	+ MFR*whret*BUSRV* persv	0.210700	0.107573	0.845222
Simple Solution	whret*fire+	0.296189	0.017836	0.861193
	BUSRV*prosv+	0.403225	0.075570	0.848123
	MFR*PROSV	0.393029	0.116854	0.809102

The QCA results support Hypothesis 2, as manufacturing is shown to combine with high- end services in stable cities. In the second term of the complex solution employment growth in manufacturing combines with employment growth in FIRE and business services. The coverage score is rather low though, and there are only three stable cities in Group 5. So, support for Hypothesis 2 is not very strong. Only Evansville, Indiana, follows this solution.

Norwich, Connecticut follows the first term of the complex solution, which combines the absence of manufacturing, wholesale/retail, fire and professional services with the presence of business services and personal services. The growth of personal services can be an indicator of a tourism-based path, but if this is the case, the pairing with business services growth is peculiar. Norwich's location near the ocean makes a

local economy based on tourism likely. However, being near New York and Boston also makes it possible that this city is the site of back office work in the producer services. Essentially, Norwich shows a unique combination of employment trends that do not suggest a clear path it has taken.

Monroe, Michigan, is the other stable city in this group. It follows the second term of the simple solution closely, but when I examined starting points for the cities in this group, it was revealed that Monroe's manufacturing score is much too low. It had a very high starting point in the manufacturing sector and still has a healthy manufacturing base. Therefore, it combines a sizeable manufacturing sector with employment growth in the business services. This could be a manufacturing-based producer-services path, making Monroe similar to Evansville, and providing additional support to Hypothesis 2. This is unclear though, and Monroe is just as likely to have benefited from back office work in the business services.

Otherwise, employment starting points are problematic for Binghamton, New York, and Decatur, Illinois. These problems will be discussed when devastated cities from this group are analyzed below.

In sum, the results for stable cities in Group 5 provide weak support for Hypothesis 2. Only Evansville, Indiana, combined manufacturing growth with the high-end services. It has likely taken a manufacturing-based producer services path. The path for Monroe, Michigan, is unclear. Despite experiencing heavy employment losses, it still has a large manufacturing sector. It has also experienced employment growth in business services. This combination suggests Monroe either followed a manufacturing-based

producer services path or it is a back-office economy of business service employers. The third stable city, Norwich, Connecticut, shows an odd combination of service employment that does not suggest it has taken a specific path. It may be similar to Lancaster and have a tourism-based local economy, but this is not certain. It is equally likely this city has back office work in the business services. These results do confirm Hypothesis 5, which argued manufacturing is more important to stable cities in Groups 4 and 5 than stable cities in Group 1. Of course, several cities in Group 1 continue to have decent manufacturing sectors, but nearly all of the stable cities in Groups 4 and 5 have gained employment or retained their employment levels in this sector.

The devastated cities in these three groups are likely to show similar combinations of employment change. The presence of employment growth in high-end services in these cities would be surprising. Instead, employment loss in manufacturing with employment growth in the low-end services, which include wholesale/retail, personal services, and professional services, likely define the paths devastated cities have followed. In hypothesis 4, I argue strong membership in the set of professional services-based cities will be a key component in the paths of devastated cities in all three groups. This hypothesis will be supported if the QCA results for all of the groups show "PROSV." The results for the devastated cities in Group 1 are shown in table 4.8 below.

Table 4.8: FS QCA Results for Cities in Group 1-Devastated Outcomes

Solution Type	Solution Terms	Raw Coverage	Unique Coverage	Consistency
Complex Solution	mfr*whret*fire*busrv* PERSV*PROSV	0.273476	0.188612	0.855304
	+ mfr*WHRET*fire* BUSRV*persv*PROSV	0.256318	0.171454	0.859396
Intermediate Solution	mfr*fire*PERSV* PROSV	0.412645	0.136354	0.882654
	+ mfr*fire*BUSRV* PROSV	0.383101	0.106809	0.813020
Simple Solution	fire*PERSV*PROSV+	0.458777	0.231049	0.893193
	persv*BUSRV*PROSV	0.312540	0.084812	0.538516

The results provide initial support for Hypothesis 4. In the first term of the complex solution, employment growth in the professional and personal services combines with employment loss in all other sectors. Syracuse and Buffalo, New York, and, to a degree, Toledo, Ohio, are the best examples of cities following this solution. The presence of professional services combined with the presence of business services in the second term of the complex solution is somewhat odd. I did not expect employment growth in high-end services in devastated cities in any group. The best examples of cities following this solution are Flint, Michigan, and Youngstown, Ohio.

As mentioned above, I did find problems with employment starting points for some of these cities. Flint and Youngstown had misleading membership scores into the sets of manufacturing and business services-based cities. In manufacturing, these two

cities had extremely high starting points and lost a lot of manufacturing employment, but both cities still have a high concentration of employment in this sector. They had low membership scores into the set of manufacturing-based cities based on their impressive employment loss in this sector, but really, they continue to have strong manufacturing sectors. These two cities were also assigned high membership scores into the set of business services-based cities, but they had the two lowest employment starting points out of all cities in Group 1. They received high membership scores in this set because they experienced strong growth, but despite this growth, they still had low employment end points in this sector. Therefore, they are not business services-based cities. The second term of the complex solution refers exclusively to these two cities, but if it was altered to account for their starting point, the solution would be as follows: MFR*WHRET*fire*persv *PROSV. Outside of Flint and Youngstown, employment starting points were not a problem for any of the other devastated cities. It is however, worth noting that Toledo, Ohio, has a fairly strong manufacturing sector. Otherwise, it is similar to Buffalo and Syracuse.

In sum, the devastated cities Group 1 have developed large professional service sectors. I believe this is a key indicator of a healthcare-based path into the global economy. For Syracuse and Buffalo, New York, the development of the healthcare economy occurred with heavy losses that almost completely eroded their manufacturing sector and growth in personal services. The growth in personal services is somewhat confusing. This sector is driven by hotel/motel employment. Its expansion could reflect efforts to attract tourists, conventions, or sprawl that has developed to service travelers.

Regardless, these two cities have followed a path based entirely on the low-end services. Toledo is similar to Syracuse and Buffalo, but it still has a fairly well developed manufacturing sector. Flint and Youngstown have also retained some manufacturing. Otherwise, these two cities have experienced employment growth in professional services and wholesale/retail. Flint and Youngstown have retained remnants of their manufacturing but they have surrounded it with professional service employment.

I expected employment growth in the professional services to be a prominent condition in the devastated cities in Group 4 as well. Additionally, following Hypothesis 5, the loss of manufacturing should matter more for the cities in Groups 4 and 5. Table 4.9 shows the results for devastated cities in Group 4.

Table 4.9: FS QCA Results for Cities in Group 4-Devastated Outcomes

Solution Type	Solution Terms	Raw Coverage	Unique Coverage	Consistency
Complex Solution	mfr*fire*PERSV*PROSV	0.396959	0.075448	0.879461
	+			
	mfr*WHRET*PERSV*PROSV	0.481119	0.159608	0.881960
Intermediate Solution	mfr*PERSV*PROSV	0.557232	0.557232	0.873148
Simple Solution	PERSV*PROSV	0.557232	0.557232	0.854097

The results for devastated cities in Group 4 show strong membership in the set of professional services-based cities in all of the solutions. The first solution term in the complex solution has a rather low unique coverage score (.07). This suggests it is almost

entirely a subset of the intermediate solution. This applies to the second term of the complex solution as well, but with a unique coverage score of .15 this is a slightly more relevant path than the first term. The intermediate solution shows strong membership in the set of professional services-based cities combines with strong membership in the set of personal services-based cities and weak membership in the set of manufacturing cities. The cities that are the best empirical instances of this solution are Saginaw, Michigan; Erie, Pennsylvania; Muncie, Indiana; and Elmira and Utica, New York. Erie, and to a certain extent, Muncie, are the cities uniquely covered by the second term of the complex solution.

The cities in this group that do not clearly follow the QCA results all share strong growth in the professional services but combine it with growth in different sectors. Lima, Ohio, combines growth in this sector with a large manufacturing sector. Mansfield and Springfield, Ohio, and Danville, Illinois, combine growth in professional services with wholesale/retail growth. Danville, however, also shows employment growth in the business services. Basically, there are many different combinations of employment change characterizing the devastated cities in Group 4.

When I examined employment starting points, I identified two cities that are still manufacturing cities. Erie, Pennsylvania, and Mansfield, Ohio, still have a lot of employment concentrated in manufacturing that is not recognized when only their change scores are examined. Additionally, Erie has a rather strong business services sector that is not recognized by its membership score into the set of business services-based cities.

Adjusting the QCA results to account for these starting points did not reduce the variety of employment combinations associated with the devastated cities in this group. In sum, about half of the devastated cities in Group 4 have developed a strong professional service sector in combination with manufacturing loss and employment growth in personal services. The Group 4 cities that follow this path include: Elmira and Utica, New York; Muncie, Indiana; and Saginaw, Michigan. Three cities have retained their manufacturing while expanding their professional services. The cities that show this combination of employment change are Lima and Mansfield, Ohio, and Erie, Pennsylvania. While showing strong manufacturing sectors, these cities do not provide evidence against Hypothesis 5. Despite having large manufacturing sectors, they lost a considerable amount of manufacturing employment. Erie and Danville show high-end service sector growth in business services with professional services growth. The specific path implied by the combination of employment trends in Erie and Danville is uncertain, but it is likely back office work. Finally, Springfield, Ohio, combines professional services with wholesale/retail growth. Despite the variety of employment combinations detailed above, all of these cities built up their professional services sector. This supports Hypothesis 4 and suggests these cities are following healthcare-based paths into the global economy.

Finally, the QCA results for devastated cities in Group 5 are shown in Table 4.10. The presence of professional services in the results will confirm Hypothesis 4. Additionally, the absence of manufacturing is expected in the results, which will support Hypothesis 5.

Table 4.10: FS QCA Results for Cities in Group 5-Devastated Outcomes

Solution Type	Solution Terms	Raw Coverage	Unique Coverage	Consistency
Complex Solution	mfr*WHRET*FIRE*busrv *persv*PROSV	0.289603	0.289603	0.838760
Intermediate Solution	mfr*WHRET*FIRE*busrv *persv*PROSV	0.289603	0.289603	0.838760
Simple Solution	FIRE*busrv*PROSV	0.296649	0.296649	0.758786

The results indicate there is only one solution consistent with the devastated outcome: the loss of employment in manufacturing, business services, and personal services combined with employment growth in wholesale/retail, FIRE, and professional services. Since the presence of professional services appears in the solution, Hypothesis 4 is confirmed; devastated cities in all groups are more likely to have built up their professional-services sector. The odd part of the results is the presence of FIRE. I examined the data to verify this finding, thinking it resulted from a problem with employment starting points. This was not the case. Johnstown, Pennsylvania, and Steubenville, Ohio, are cities that have taken this path. Both had low employment starting points in FIRE in 1970, gained a substantial amount of employment in this sector over the course of economic restructuring, and had high end points. They are devastated cities with high-end service employment in FIRE.

There are two other devastated cities in this group: Binghamton, New York and Decatur, Illinois. From my earlier analysis of starting points, Decatur stood out as a

manufacturing city. It received a lower membership score than it should have into the set of manufacturing cities because of its strong loss of manufacturing employment, but its high employment starting point in 1970 has kept Decatur a manufacturing city. Otherwise, its most notable employment trend over the course of economic restructuring is growth in wholesale/retail. Binghamton is another odd devastated city in that it has gained high-end service employment. Binghamton underwent massive deindustrialization, gained employment in the low-end of the services (wholesale/retail and professional services), and gained employment in the high-end business services.

In sum, all devastated cities in Group 5 have expanded their professional service sectors at an impressive rate. This confirms Hypothesis 4. One city lost a lot of manufacturing employment but still has a large manufacturing sector. Actually, all devastated cities in this group lost manufacturing employment, which supports hypothesis 5. The most surprising finding though, is three of the four devastated cities in this group show employment growth in the high end services. A couple of cities in Group 4 also showed this trend. Again, this is very likely to be a large employer providing back office work. In the case of Johnstown and Steubenville, this would be back office work for a large insurance company. For Binghamton, whose growth was in business services, the source of growth is less clear.

Conclusion

My goal in this chapter was to develop a more detailed picture of economic restructuring in the Rust Belt region than that provided in Chapter 3. In particular, I wanted to uncover specific paths cities have taken to adapt to the global economy. To

meet this goal I narrowed my focus to the stable and devastated cities in three of the groups that were formed in Chapter 2. I used fuzzy set qualitative comparative analysis to identify how employment change in different sectors combined in the stale and devastated cities in each group. The combination of change trends suggest specific paths the cities have taken to over the turbulent period from 1970 to 2000. To verify that these changes were experienced similarly, and cities were indeed following similar paths, I checked if the fuzzy set results were affected by employment starting points in each sector in 1970. If starting points were a problem, I discussed how they were and what this meant for the affected cities. I also analyzed the combinations of employment trends in cities that did not conform to the fuzzy set QCA results to account for their unique paths.

Overall, the process detailed in this chapter can be seen as one in which I transformed the quantitative dataset used in the last chapter into a qualitative dataset. The qualitative dataset provides a much more detailed portrait of how the period of economic restructuring was experienced by certain cities in the Rust Belt region. I provide a summary of this portrait in Table 4.11. This is a large table (essentially, it is a qualitative dataset), but it is a more concise presentation of the results discussed above. The first column of the table lists the cities in each group. The second column shows the employment trends each city displayed in QCA notation. However, in the QCA notation I also indicate where employment starting points were problematic and required adjustments be made to the QCA solutions. These adjustments are provided in parenthesis. The third column is a description of these trends and the final column lists

the specific path the cities appear to be taking. I conclude by using this table to once again evaluate my hypotheses and to highlight some of the more interesting trends.

Table 4.11: Summary of the Results

Results for Stable Cities			
Group 1: Medium-sized manufacturing cities with a high concentration of employment in the metals-based industries			
City	Combination of Employment Trends (QCA)	Description of Employment Trends	Specific Path
Columbus, OH Worcester, MA	mfr*FIRE*BUSERV* prosv	These two cities lost a substantial amount of manufacturing, but they expanded their employment in the high-end services. They had weak FIRE and business service sectors in 1970 that grew rapidly. They experienced minimal growth in professional services.	Corporate-based Producer Services
Indianapolis, IN	mfr*BUSERV* prosv*(strong FIRE sector that experienced slow growth)	This city also lost a great deal of employment in manufacturing but experienced the strongest rate of change in business services out of all cities in this group. It already had a strong base in this sector that it expanded. It also had a strong base in FIRE that experienced slow growth, remaining a strong sector in 2000. It experienced minimal growth in professional services. This city expanded an already strong high-end service economy.	Corporate-based Producer Services
Cincinnati, OH	mfr*FIRE*prosv* (strong BUSRV sector that experienced slow growth)	Cincinnati experienced massive deindustrialization, but greatly expanded employment in an already strong FIRE sector. It also had a strong base in business services that experienced slow growth, remaining strong in 2000. It experienced minimal growth in professional services. In sum, Cincinnati expanded an already strong high-end service economy	Corporate-based Producer Services

City	Combination of Employment Trends (QCA)	Description of Employment Trends	Specific Path
Akron, OH Allentown, PA	mfr (but still strong MFR presence)* FIRE*BUSRV*prosv	These two cities lost a considerable amount of employment in manufacturing, but they had very high starting points in this sector and a strong manufacturing presence remains. These cities surrounded their manufacturing with growth in the high-end services and did not experience growth in professional services.	Corporate-based Producer Services OR Manufacturing-based Producer Services
Grand Rapids, MI	MFR*whret*persv*prosv*(strong FIRE and BUSRV sectors)	This city retained its manufacturing and gained very little employment in the low-end services. It has always had strong high-end service sector employment and experienced slow employment growth in both FIRE and business services. Remarkably stable city.	Manufacturing OR Manufacturing-based Producer Services
Group 4: Smaller manufacturing cities with a high concentration of employment in the metals-based industries			
Ann Arbor, MI Bloomington, IN Lansing, MI	Growth in all sectors, except manufacturing	These cities were excluded from the analysis. Since they are home to major research universities, they are different from the other cities in this group.	Research/ Knowledge-based
Holland, MI Kalamazoo, MI Kokomo, IN	MFR*WHRET*fire*busrv*persv*prosv	These cities retained their manufacturing and experienced growth in the wholesale/retail sector. Otherwise, they did not experience significant employment growth in any other sector	Manufacturing
Elkhart, IN Jackson, MI	MFR*whret*fire*busrv*persv*prosv	These cities retained manufacturing and did not experience notable growth in any other sector	Manufacturing

City	Combination of Employment Trends (QCA)	Description of Employment Trends	Specific Path
Fort Wayne, IN Columbus, IN	MFR*whret*persv* prosv* (strong FIRE and BUSRV sectors that experienced slow growth)	These two cities retained manufacturing employment and experienced slow growth in all other sectors, but they had strong foundations in the high-end services they built upon. These cities were remarkably stable.	Manufacturing OR Manufacturing-based Producer Services
York, PA	mfr (but still strong manufacturing presence)* *whret*FIRE*BUSRV*prosv	York lost a lot of manufacturing employment, but it had such a high concentration of employment in this sector that, despite these losses, there is still a strong manufacturing base there. York also experienced growth in high-end service sectors that had a weak presence in the city in 1970.	Manufacturing-based Producer Services
Lancaster, PA	mfr*WHRET*FIRE* BUSRV*PERSV	This city lost its manufacturing and experienced notable growth in all service sectors, except professional services. This combination of employment trends suggests several possible paths.	Tourism OR Corporate-based Producer Services OR Research/ Knowledge-based
Group 5: Smaller manufacturing cities with a high concentration of employment in nonmetals-based industries			
Norwich, CT	mfr*whret*BUSRV* PERSV*PROSV	Norwich lost its manufacturing and only experienced notable service sector growth in business services and personal services. This is an odd combination that suggests a couple of paths.	Tourism OR Back Office Services
Evansville, IN	MFR*whret*FIRE* BUSRV*persv	Evansville has maintained a strong manufacturing sector and experienced impressive rates of growth in the high-end services.	Manufacturing-based Producer Services

City	Combination of Employment Trends (QCA)	Description of Employment Trends	Specific Path
Monroe, MI	mfr (but still strong manufacturing presence) *whret*fire*BUSRV* persv	Monroe is similar to Evansville, but it lost a lot of manufacturing employment. Still, there is a strong manufacturing presence in this city, and around it, Monroe has experienced employment growth in high the BUSRV sector.	Manufacturing-based Producer Services OR Back Office Services
Results for Devastated Cities			
Group 1: Medium-sized manufacturing cities with a high concentration of employment in the metals-based industries			
Syracuse, NY Buffalo, NY	mfr*whret*fire* busrv*PERSV* PROSV	These cities experienced dramatic deindustrialization. Their only notable growth was in low-end services, specifically personal services and professional services. The personal service growth is peculiar. This is a sector linked to tourism but it is also a sector that can grow from typical sprawl.	Healthcare-based OR Tourism
Toledo, OH	mfr (but still strong manufacturing presence)*whret* fire*busrv*PERSV* PROSV	Toledo is very similar to Syracuse and Buffalo but it still has a high concentration of employment in manufacturing.	Manufacturing OR Healthcare-based OR Tourism
Flint, MI Youngstown, OH	mfr (but still strong manufacturing presence)* WHRET*fire*persv* PROSV	Flint and Youngstown have experienced dramatic employment losses in manufacturing, but there is still a strong manufacturing presence in these cities. Otherwise, they have experienced growth in wholesale/retail, which likely reflects big box and chain stores, and in professional services.	Manufacturing OR Healthcare-based

Group 4: Smaller manufacturing cities with a high concentration of employment in the metals-based industries			
City	Combination of Employment Trends (QCA)	Description of Employment Trends	Specific Path
Elmira, NY Utica, NY Muncie, IN Saginaw, MI	mfr*PERSV*PROSV	These cities experienced dramatic declines in manufacturing. Their only growth areas have been in the low-end services. Again, employment growth in personal services is peculiar.	Healthcare-based OR Tourism
Lima, OH	mfr (but still strong manufacturing presence)* PROSV	Lima lost manufacturing employment but still has a manufacturing presence. The only other notable employment trend is growth in professional services.	Manufacturing OR Healthcare-based
Mansfield, OH	mfr (but still strong manufacturing presence)* WHRET*PROSV	This city is similar to Lima but has shown impressive growth in wholesale/retail, which is likely from big box and chain stores.	Manufacturing OR Healthcare-based
Springfield, OH	mfr*WHRET*PROSV	This city deindustrialized and gained employment in only the low-end services.	Healthcare-based
Erie, PA Danville, IL	mfr*WHRET*BUSRV*PROSV	Danville lost its manufacturing employment and gained an odd mix of employment in high and low end services. The combination of business services and professional services could reflect back office employment in a major business services employer. Erie however, still has some manufacturing despite impressive losses in this sector.	Back Office Services OR Healhcare-based

Group 5: Smaller manufacturing cities with a high concentration of employment in nonmetals-based industries			
City	Combination of Employment Trends (QCA)	Description of Employment Trends	Specific Path
Decatur, IL	mfr (but still a strong manufacturing presence)*WHRET	Decatur lost a lot of manufacturing but continues to have a considerable amount of employment concentrated in this sector. Only wholesale/retail growth has accompanied the manufacturing there.	Manufacturing
Johnstown, PA Steubenville, OH	mfr*WHRET*FIRE* busrv*persv*PROSV	These cities show the same development of professional services with the loss of manufacturing. However, they stand out in that they have gained employment in FIRE. This is likely to be back office work.	Back Office Services OR Healthcare-based
Binghamton, NY	mfr*WHRET* BUSRV*persv* PROSV	This city is very similar to Johnstown and Steubenville, but its high-end service growth is in the business services.	Back Office Services OR Healthcare-based

Table 4.11 condenses a large quantity of information to allow for an easier evaluation of the hypotheses than the previous discussion of the results. In Hypothesis 1, I argued the stable cities in Group 1 were the most likely to follow a corporate-based producer services path into the global economy. Four out of seven stable cities in this group have almost certainly taken this path. Two more cities, Akron and Allentown, show a combination of employment trends that make it likely they too have reorganized their local economies in this way. Lancaster, Pennsylvania, is the only other city in all three groups that shows the potential for following a corporate-based producer services path. Thus, there is strong evidence in support of Hypothesis 1. A corporate-based producer services economy is more likely in stable cities in Group 1.

In Hypothesis 2, I argued that a manufacturing-based producer services path was most likely to be taken by stable cities in Groups 4 and 5. In particular, Group 5 cities, due to their manufacturing histories, were more likely to follow this path. Three stable cities in Group 4 show the combination of employment trends associated with following this path, and two out of three stable cities in Group 5 appear to have taken this path as well. These cities would provide support for Hypothesis 2, but three stable cities in Group 1, Grand Rapids, Akron, and Allentown, also show the potential for manufacturing-based producer service economies. Thus, this path is not specific to the stable cities in Groups 4 and 5. It could be a more common path for cities in these groups, especially Group 5, but given the potential for this path in Group 1 cities there is not enough evidence to support Hypothesis 2.

There is enough evidence to support Hypothesis 3, in which I argued that simple manufacturing paths were more likely in the stable cities in Groups 4 and 5. Grand Rapids is the only stable city in Group 1 that did not experience a dramatic deindustrialization. On the other hand, five stable cities in Group 4 have retained or experienced growth in this sector. One stable city in Group 5 has retained manufacturing, but its combination of employment trends suggest a manufacturing-based producer services path is more likely. Therefore, a plain manufacturing path is more common in stable cities in Group 4. This supports Hypothesis 3.

In Hypothesis 4, I stated professional services would combine with low end services in all devastated cities. This is indeed the case. Only one stable city, Decatur, Illinois, did not show employment growth in professional services. Otherwise, every devastated city experienced expansion of this sector. Interestingly, only one stable city, Norwich, Connecticut, exhibited impressive growth in this sector. The lack of notable growth in this sector for stable cities provides additional evidence that professional services economies (i.e., healthcare economies) are most common in devastated cities.

Finally, in Hypothesis 5 I argued that manufacturing is likely to be a more significant resource for the smaller cities in Groups 4 and 5 than for the larger cities in Group 1. This hypothesis would be supported if both stable and devastated cities in Group 1 experienced extreme losses of employment in manufacturing. Additionally, stable cities in Groups 4 and 5 had to retain manufacturing, while the devastated cities in these two groups had to show extreme employment loss in this sector. All cities in Group 1, except for Grand Rapids, Michigan, did experience massive deindustrialization.

Furthermore, the retention of manufacturing employment was evident in nearly all stable cities in Groups 4 and 5. Finally, the devastated cities in these groups did deindustrialize. Together, these results supported hypothesis 5. Manufacturing is a more important part of the local economies in the smaller, stable cities.

A final noteworthy finding is that there is high-end service growth in some of the devastated cities. Some of these cities experienced employment growth in business services or FIRE but not in both sectors at the same time, or with manufacturing. This was a trend found in some of the stable cities in Group 4 as well. I did not include these Group 4 cities in Table 4.11 because they were not the best examples of stable cities. They straddled the boundary between the stable and struggling performance categories used in the previous chapter, and therefore, they only had (.6) membership into the set of stable cities in this chapter. Regardless, the Group 4 cities and these devastated cities share the combination of employment growth in business services or FIRE with employment growth in the professional services. In Table 4.11, I suggested this combination is very likely to indicate back office work for major business services or FIRE firms, but this suggestion overlooks any sort of relationship between professional services and these sectors. It just focuses on the growth in business services or FIRE. The type of economy, or specific path, suggested by high-end service sector growth combined with employment growth in professional services is not clear and deserves further exploration. Drawing from the regression results, it is very likely that how these two sectors connect explains the differences between struggling and devastated cities.

In conclusion, in this chapter I show how certain combinations of sector-level employment change suggest specific paths cities have taken into the global economy. By doing so, I provide the most detailed description possible of economic restructuring in the Rust Belt region using sector-level data. In the following chapters, I use a case study approach to elaborate upon these combinations of employment change in specific cities.

CHAPTER 5: MANUFACTURING CHANGE IN SPECIFIC STABLE AND DEVASTATED CITIES

In previous chapters, I have examined how cities in the Rust Belt region have reorganized their local economies to adapt to the global economy in two ways. First, I provided a general picture for all the cities in the region by identifying the changes in sector-level employment that characterize stable, struggling, and devastated cities. Second, I refined this general picture by narrowing my focus to specific groups of stable and devastated cities. I highlighted how sector-level employment changes combine to suggest more specific economic trajectories these cities have followed over the course of economic restructuring. This is the first of two chapters in which I further narrow my focus to explain the processes of economic transformation that have happened in specific cities.

The cities I analyze are drawn from Group 1. These are the medium-sized cities in the region that had strong manufacturing histories in the vulnerable metals-based industries. Many of the cities in this group are commonly cited in the deindustrialization literature as victims of industrial decline. This makes their different experiences over the course of economic restructuring particularly interesting. I reconstruct the economic histories of two stable cities and two devastated cities from this group. I begin by examining manufacturing.

In the previous chapter, I showed loss of manufacturing employment did not distinguish stable cities from devastated cities in Group 1. At first, this finding makes cities from this group a curious choice for a closer analysis of manufacturing. Over the

course of economic restructuring, both stable and devastated cities experienced substantial losses in manufacturing employment. However, despite these losses, many of these cities still have large manufacturing sectors. It is likely existing manufacturing is important to city performance, but exactly how or why is not captured by analyzing broad, sector-level data. Using a case study approach, I can push the analysis past general employment trends to show how existing manufacturing differs in type and form in stable and devastated cities. By highlighting these important differences I present a more nuanced understanding of the relationship between manufacturing change over the course of economic restructuring and city performance.

There are four parts to this chapter. First, I review what existing manufacturing may look like in type and form and what I expect to find in my stable and devastated cases. Second, I provide a methods section in which I discuss the selection of my cases and the sources of information I used to conduct the analysis. In the third section, I discuss the results. I provide a detailed description of how manufacturing has changed and how it currently exists in each of my cases. In this section I not only discuss employment trends but I also focus on the types of manufacturing that remain in the stable and devastated cities and how the remaining manufacturing industries are organized. In the fourth section, I offer concluding remarks. I focus specifically on what my findings suggest about the relationship between deindustrialization and urban decline.

Possibilities for Changes in Manufacturing in Stable and Devastated Cities

As noted above, some cities in Group 1 continue to have large manufacturing sectors despite experiencing dramatic losses in manufacturing employment over the course of economic restructuring. By examining the remaining manufacturing in these cities, I develop a more thorough account of how manufacturing has changed in specific cities. In particular, changes in the types of products being made and how manufacturing industries are organized can distinguish stable and devastated cities. These changes are not captured when I analyze sector-level employment change. In this section, I briefly outline what these changes may look like.

The remaining manufacturing can be of two different types. It can consist of old manufacturing that has proven to be resilient, or it can consist of new manufacturing that has quietly developed in the background of deindustrialization. By "old" and "new" I mean differences in the products being produced. The former consists of industrial manufacturing in those industries whose growth led to the rise and subsequent decline of this region: the metals-based industries. The production of primary metals, automobiles, appliances, and machinery is old manufacturing. The latter consists of post-industrial manufacturing in industries that have experienced growth with the rise of the global economy. The production of equipment related to the computer, biomedical, telecommunications, and alternative energy industries is new manufacturing.

The remaining manufacturing can also take on two different forms. The first form is a mass production model where large factories employ thousands of workers and

produce a substantial share of an industry's output. The second form consists of many small competitive producers. These two forms have coexisted as alternative models of industrial organization (see Sabel 1980), but the second form has increasingly been associated with new types of manufacturing (Lash and Urry 1994). This does not have to be the case though. Old types of manufacturing can take this form and vice versa.

There are two ways Rust Belt cities can have remaining manufacturing of the old type in the mass-production form. First, the extent of manufacturing loss in a city may not have been great enough to wipeout the massive manufacturing sector that had developed there. Basically, the city did not completely deindustrialize. In cities where this has happened, the same establishments that served prominent roles in the local economy before economic restructuring are likely to be where work is still being performed, albeit in a lesser capacity. This is a very likely outcome in "company towns" where a single employer dominated the economic, social, and cultural life of the city (Jacobs 1969). The second way cities can end up with remaining manufacturing of this type and form is through the acquisition of a foreign transplant. Of course, transplants do not necessarily have to be in old types of manufacturing, but for the most part, the kind of transplant that cities are the most active in trying to lure is the large automobile manufacturer (Perucci 1984). Acquiring this kind of transplant replenishes old manufacturing in the large, mass-production form.[18]

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[18] Foreign companies may organize the labor process differently within their establishments. This is especially common in Japanese automobile manufacturers (see Osterman 1999). This makes them different than typical manufacturers that take the mass-production form. However, when I discuss form I am specifically interested in how an industry is organized within a local economy rather than how work is organized within

Existing manufacturing in cities can be of the old type in the small, competitive form if cities have craft systems of production that have survived the period of economic restructuring. In craft systems, skilled manufacturers compete vigorously with one another to create the highest quality product. These industries have been shown to develop alongside old manufacturing in the large, mass production form (Piore 1980). In many cases, they serve as highly skilled suppliers to the larger, mass producers. This makes it unlikely this type and form of manufacturing would be found without some of the manufacturing discussed previously (remnants of incomplete deindustrialization or transplants), unless they are flexibly specialized.

Flexible specialization is a term used to describe a unique form of production involving small, competitive manufacturers. Flexibly specialized producers maintain relationships with their competitors, suppliers, and customers that are based on cooperation and trust (see Best 1990; Sabel 1989; and Sabel & Zeitlin 1985). They utilize these relationships to cut production costs, respond quickly to changes in market conditions, and reduce the time it takes to perform tasks, but most importantly, these relationships are used to fuel product innovation (Piore and Sabel 1984). Flexibly specialized craft industries are very adaptable to changes in the broader economic environment, and they can more easily transform their products and improve upon quality to remain competitive in uncertain economic circumstances. Flexibly specialized systems of production are resilient and have been found in older types of manufacturing, such as textiles (Zeitlin and Totterdill 1989), tool-making (Schmitz 1992; Lorenz 1989)

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an establishment. Thus, a Japanese automobile manufacturer is consistent with the mass-production model, as I conceptualize it.

and furniture (Best 1989), but it is more common in post-industrial manufacturing (Lash and Urry 1994). The history of old types of manufacturing in large, mass production facilities makes it unlikely manufacturing of this type and form exists in Rust Belt cities, but it is possible.

Since new manufacturing often takes the small competitive form and is often flexibly specialized, the combination of new manufacturing in the large, mass-production form is uncommon. Even so, Rust Belt cities can have manufacturing of this type and form if existing large manufacturers were able to expand their old production in new ways. Essentially, old, mass-producers need to be innovative for this combination to develop in a city. Jane Jacobs (1969) provides an example of how this could happen by detailing the transformation of Minnesota Mining & Manufacturing Company. This company, currently known as 3M, had its start in processing rock into sand. 3M saw the manufacturing of sandpaper as a logical extension of the work it was performing, but it consistently failed in attempts to develop an adhesive that adequately held the sand onto the paper. Nevertheless, in its exploration of adhesives, 3M unintentionally produced a variety of tapes that could be used for personal, office, and industrial purposes (52-54). As a result, 3M became a manufacturer of sand and tape. Following this example, Rust Belt cities can have manufacturing of the new type and old form if they have large companies that "parented" new types of manufacturing in ways similar to 3M (55).

Finally, the remaining manufacturing in Rust Belt cities can be of the new type in the small, competitive form. This is post-industrial manufacturing that is more common to growth regions of the United States, such as the Southwest and West. It is also

knowledge and research driven manufacturing that is often flexibly specialized. The aerospace and biotech industries in Orange County (see Scott and Pauls 1990), and of course, the computer-industry in Silicon Valley (see Saxenian 1994) are examples of manufacturing of this type and form. Post-industrial manufacturing is often linked to large research universities, government research institutions, or defense spending (Saxenian 1994, Hill and Feagin 1987). If Rust Belt cities have developed manufacturing of this type and form it is likely they have done so by utilizing these resources.

Table 5.1 summarizes the discussion above. It also provides an analytical framework for comparing manufacturing in my stable and devastated cases.

Table 5.1: Possibilities for Remaining Manufacturing in Rust Belt Cities

		Type of Manufacturing: Old	Type of Manufacturing: New
Form of Manufacturing: Large, Mass Production		Incomplete deindustrialization or Foreign transplant manufacturing 1	Companies that have "parented" new products or manipulated existing products to exploit emerging markets. 2
Form of Manufacturing: Small, Competitive		4 Metals-bases suppliers or Flexibly specialized craft manufacturing	3 Post-industrial manufacturing that is high-tech and flexibly specialized

Not only does Table 5.1 describe the different ways remaining manufacturing can appear in my cases, but it can also be used to map manufacturing progress. For instance, quadrant 1 is describes a type and form of manufacturing that can currently exist, but it is also the starting point for all Group 1 cities at the beginning of economic restructuring. The local economy in all of these cities was defined by large factories in the metals-based industries. How did this manufacturing change within these cities over the course of economic structuring? If a city did not change its manufacturing significantly (reduced capacity or was replenished by a transplant), that city did not progress beyond quadrant 1. Despite the fact that surviving manufacturing and transplants are important because they employ a substantial number of people, ultimately, these cities need to transform themselves to better fit the global economy for long term economic stability. This kind of transformation is not accomplished if cities started in quadrant 1 in 1970 and remain in quadrant 1 in 2000. Instead, these cities are holding on to a fading past, perhaps desperately. Therefore, I expect the remaining manufacturing in my devastated cases to consist of remnant manufacturing that survived deindustrialization and foreign transplants.

On the other hand, if the remaining manufacturing in a city is of the type and form described in quadrant 3, that city has completely transformed its manufacturing. It transitioned from quadrant 1 to quadrant 3, which means over the course of economic restructuring it has progressed from being a vulnerable, metals-based, manufacturing city into an "innovation center" that develops the new, cutting edge products for the global economy (Logan and Molotch 1987). While this is not an impossible transition, it is

extreme and very unlikely in Rust Belt cities. Their deep integration into the old manufacturing economy and the economic shock caused by its collapse put these cities at a comparative disadvantage to cities in growth regions. The socio-economic problems caused by industrial crisis made Rust Belt cities "disfavored cities" in the global economy (Savitch and Kantor 2002). Therefore, I do not expect to find manufacturing of this type and form in my cases, but that does not mean it cannot develop in these cities in time.

In fact, the development of the manufacturing described in quadrant 3 likely hinges on a city having the types and forms of manufacturing described in quadrants 2 and 4. Again, Table 5.1 does not only describe remaining manufacturing in Rust Belt cities, it can be interpreted as a continuum of progress made towards transforming manufacturing from the old type and form into the new. Where quadrant 3 represents successful transformation, quadrants 2 and 4 may represent the intermediate stages cities need to go through to get there. Thus, I expect the manufacturing in quadrants 2 and 4 to be indicators of cities in transition. As opposed to cities whose manufacturing is described by quadrant 1, cities with quadrant 2 and 4 manufacturing are not holding on to the past. However, they have not developed to the point that they have fully transformed into post-industrial production centers, such as cities whose manufacturing is described by quadrant 3. Still, I believe this intermediate stage of development is enough to distinguish my stable cases from my devastated cases.

Methods

I conduct a historical comparison of the economic changes that occurred in two stable cities and two devastated cities. Grand Rapids, Michigan, and Akron, Ohio, are my stable cities. Flint, Michigan, and Toledo, Ohio, are my devastated cities. I selected a stable and a devastated city from the same state to minimize state-level differences that could account for city performance. I also selected cases that were similar with respect to size and industrial composition at the starting point of economic restructuring. I used the classification system developed in Chapter 2 to assist in the case selection. The four cities I analyze have the highest membership scores into Group 1, meaning they are the best examples of medium-sized, manufacturing cities with a history in the metals (see chapter 2, Table 2.4, pages 48-49).[19] The exception is Akron. This city has a lower membership score into Group 1 because it did not have as much manufacturing concentrated into the metals-based industries as the other cities. Concentration into metals was my measure for a city's vulnerability to deindustrialization. Akron's manufacturing was concentrated in the rubber industry, which was vulnerable because of its direct tie to automobile manufacturing. Actually, the rubber industry experienced a more dramatic transformation over the course of economic restructuring than the steel and automobile industries (Crandall 1993). Thus, Akron was just as vulnerable as the

[19] Actually, Youngstown, Ohio, has a higher membership score in Group 1 than Toledo and could have been chosen as the second devastated case. I decided not to focus on Youngstown because in my estimation it is a unique case. Youngstown had more employment concentrated in manufacturing and more manufacturing employment concentrated in the metals than all other cities in the region. It was uniquely vulnerable to deindustrialization. Toledo seemed a better match to the other cases.

other cases, if not more, to deindustrialization. Table 5.2 provides descriptive statistics on my cases at the starting point of economic restructuring.

Table 5.2: Demographic and Economic Descriptive Statistics (1970)

	Akron	Flint	Grand Rapids	Toledo
MSA Population	679,077	446,058	523,536	644,655
Central City Population	275,420	193,380	197,534	384,015
% Graduating High School	35.3	35.4	33.8	34.5
Poverty Rate	8.4	8.4	9.1	9.2
Unemployment Rate	4.4	5.3	5.9	4.0
Median Income	18,404	17,724	17,253	18,874
% Employed in Manufacturing	34.5	38.5	29.0	29.0
% Employed in Metals-based Industries	35	50	52	53

My research consists of close examination of archival materials and interviews. I started by carefully examining the Sunday business pages of the local newspaper to acquire information on significant changes to the local economy in each city. The local papers of each city are listed below:

- Akron, OH: Beacon Journal
- Flint, MI: Flint Journal
- Grand Rapids, MI: Grand Rapids Press
- Toledo, OH: Toledo Blade

The local newspapers primarily focused on the largest employers in the city and on negative news (i.e., closings and layoffs). Therefore, they were especially useful for

gathering information on the large, mass producer forms of manufacturing and how they changed.

I supplemented the newspaper information with information from local business journals. These were either monthly or weekly journals published by economic planning departments of the city government or local chambers of commerce. Unfortunately, they were not available for the earlier years of economic restructuring but did provide consistent and valuable local economic information from the mid-1980's to 2000. The business journals I used are listed below:

- Akron, OH: Akron Business Register (1986-1995)

  Small Business News (1995-2000)
- Flint, MI: Business to Business (1986-2000)
- Grand Rapids, MI: Grand Rapids Business Journal (1985-2000)
- Toledo, OH: Toledo Business Journal (1985-2000)

  Development News (1995-2000)

These journals also provided information on larger employers in the city, but unlike the local newspapers, they also focused on smaller companies and positive news (business formation). Additionally, they frequently described relations between manufacturing establishments, making them the best sources of information on forms of manufacturing.

Other sources of information I used were local directories of employers and secondary historical accounts. The directories listed every employer in the city, the number they employed, and the type of manufacturing they performed. These directories

were not available for all of the years in the time period I was interested in. Still, the available directories proved useful for analyzing how types and forms of manufacturing changed in each city. The secondary sources provided general accounts of economic transition. They were the least detailed source of information, but they did often describe the organization of industries within the cities. Thus, they were acceptable sources of information on manufacturing forms.

Finally, I interviewed city government officials, leaders of economic development organizations, local business owners, members of the local press, and community leaders. The interviewees were asked to explain economic change in their cities from 1970 to 2000. Additionally, the interviewees provided valuable information on the individuals and organizations involved in economic planning, how these actors developed economic plans for their cities, and how these plans were implemented during this turbulent time period.[20]

I combined the information from all of these sources to reconstruct the economic histories of each city from 1970 to 2000. I present these histories in the next section, and compare how manufacturing has changed in my stable and devastated cases.

Results: Comparing Manufacturing in Stable and Devastated Cases

I begin my discussion with the large mass producers in old types of manufacturing (the manufacturing described in quadrant 1 of Table 5.1). Below, I describe how

[20] I do not use the information I obtained on organizations and individuals in this dissertation. I collected these data with the hopes of adding onto this project in the future by explaining why stable and devastated cities were able to make the transitions they made. At that point, I intend to focus on collaboration and competition between economic, political, and community organizations. For now, the interviews served as checks on the information I had acquired from my archival sources.

manufacturing of this type and form existed in each city at the starting point of economic restructuring and how it changed over time. I begin with my devastated cases, starting with Flint, Michigan.

Old Types of Manufacturing in the Large, Mass Production Form:

Flint, Michigan, was a company town in 1970 and continues to be today. General Motors, which once had its headquarters in Flint, dominates the local economy. In the early 1970s, GM employment peaked in Flint at a little over 80,000 workers. Employment in the auto industry fluctuated throughout the 1970s, but by the end of 1979, Flint still had 76,910 workers dispersed in different car and truck assembly plants, metal fabricating plants, and engine assembly plants ("New Layoffs Announced by Area GM Plants" 1982). In the 1980s a dramatic wave of deindustrialization would hit Flint, with 1982 being a particularly devastating year. From 1970 to 1980, GM cut less than 5,000 jobs in Flint. By the end of 1982, over 16,000 GM employees were on furlough without a recall date ("GM Layoffs Again to Top Record Monday" 1982). Table 5.3 provides a timeline for the announcements. It shows the number of employees idled by the end of the week for the date provided. After this flurry of layoffs, Flint would receive more bad news to start the next year. In February of 1983, General Motors announced it was closing the Fisher Body Flint Plant on March 5, 1985. The plant employed 3,700 workers (Guilford 1983, Noble 1983). This would be the first of complete plant shutdowns.

Table 5.3: Timeline of GM Layoffs in Flint (1982)

Date	Facility	Number Laid Off
1/15/82	Buick Manufacturing Facility	1,000
	Fisher Body Flint	2,500
	Chevrolet Engine Plant	1,614
	Chevrolet Metal Fabricating	1,250
8/13/82	Chevrolet Engine Plant	475
8/27/82	Buick Engine Plant	2,000
9/21/82	Buick Manufacturing Facility	1,100
9/24/82	Fisher Body Flint	375
10/15/82	Unspecified GM Plants	804
	Flint GM Truck Plant	1500
	Chevrolet Manufacturing Complex	503
12/10/82	Unspecified GM Plants	122
	Unspecified Chevrolet Plants	66
12/24/82	Flint GM Truck Plant	3,000
		Total = 16,309

Sources: "More Face Layoffs at Area GM Plants" 1982; "Chevy Engine Plant to Idle 475" 1982; "2000 Buick Workers to be Idled" 1982; "New Layoffs Announced by Area GM Plants" 1982; Espo 1982a; "Area GM Plants to Put 378 More on Indefinite Layoff" 1982; Espo 1982b; "GM Idled Roll to Hit Record 157,000" 1982; Espo 1983.

Some of these laid off workers were recalled in 1983, but this would be the last good year for Flint manufacturing. Starting in the mid 1980s and throughout the 1990s, GM would shift employment in and out of its manufacturing facilities in Flint. Some plants dramatically reduced operating capacity and others closed entirely. Others would be absorbed by a different facility or downsize and take on a different name. This makes the specific changes in employment in each facility difficult to track, but overall, by the

beginning of the 1990s, overall GM employment in Flint was near 51,000 workers (Wickham 1991). By the end of the period of economic restructuring there would be less than 20,000 GM jobs in Flint. City officials state that from 1970 to 2000 Flint lost around 60,000 manufacturing jobs at General Motors facilities. In addition, other companies connected to the auto industry, such as Du Pont Auto Paint Division and AC Sparkplug, also vanished in Flint (Wickham 1992; Personal Interview 1/17/07a; Personal Interview 1/17/07b).

Despite this incredible wave of deindustrialization, Flint remains a manufacturing city and GM maintains a strong presence there. After the turbulent 1980s, Flint retained its position as the leading General Motors employment center worldwide, and the company continues to be the largest employer in the city (Wickham 1991; "Flint Area Still GM's 'Number One'" 1989). Existing General Motors facilities include:

- GM Truck Group, Flint Truck Assembly
- GM Powertrain Flint North
- GM Powertrain Flint South
- GM Flint Metal Center
- Delphi Flint East
- GM Flint Tool & Die
- GM Grand Blanc Weld Tool Center
- GM Service Parts Operations (warehouse and offices)

As expected, large factories that produce automobiles continue to play a prominent role in the local economy of this devastated city. The remaining manufacturing in Flint consists of remnants of its old manufacturing sector. Unlike Flint, Toledo was not a single company town. In fact, at the starting point of economic restructuring, Toledo was home to seven *Fortune 500* company headquarters, including: Libbey Owens Ford (LOF), Sheller Globe, Dana Corporation, Champion Sparkplugs, Kaiser Industries, Owens-Corning, and Owens-Illinois. Even though it was not dominated by one main employer, Toledo was deeply integrated into one main industry—automobile manufacturing ("32 Toledo Operations Among Nation's Top 500; Seven Corporate Headquarters" 1968). The first four of the above companies produced parts for cars, and Kaiser Industries manufactured Jeep 4x4s. Kaiser sold Jeep production to AMC in 1970 and it would later become a part of Chrysler. In addition to Jeep, GM and Ford both had large manufacturing facilities in Toledo.

The other companies listed above, including LOF, are glass manufacturers. Thus, Toledo was also known as the "Glass City," but really, auto production dominated the local economy. LOF and O-I were the only glass companies that had manufacturing facilities in Toledo. Owens-Corning, a manufacturer of fiberglass, continues to be headquartered in Toledo, but it never had production based in the city (Pakulski 1999; "Owens-Corning Lays Off 2600" 1974). In the late 1990s, LOF was bought by Pilkington Industries of London, England. This reduced LOF's presence in Toledo and by 2000 only a windshield production facility employing around 1,000 workers remained. Costly legal battles concerning asbestos led to a dramatic restructuring of O-I

from 1980 to 2000. Over this time period, the company would reduce its blue and white collar workforce in Toledo by at least 5,000 workers. By 2000, O-I employed around 1,000 workers, mostly at its local headquarters (Ohio Manufacturers Directory 2000; Lane 1995; Brickey 1983). Thus, the manufacturing that made Toledo the "Glass City" has been nearly wiped out. What is left of glass production primarily serves the auto industry.

The auto-industry continues to dominate the local economy but, similar to Flint, it has undergone a radical transformation from what it once was. By 2000, Sheller-Globe and Champion Sparkplugs had shutdown.[21] In 1992, Dana Corporation would close its last manufacturing facility in the city, the Spicer Transmission Plant, which employed more than 3,000 workers at the peak of operations (Baessler 1992).[22] Jeep, which became Toledo's largest employer, experienced cutbacks in the mid-1970s, when 6,500 workers were idled, and in the mid-1980s, when around 2,000 workers were laid off (Chavez 1986; Vernyi 1986a; "3000 Laid Off" 1975; "Jeep Lays Off 3500" 1974).[23] The Jeep employment losses in the mid-1980s were especially disconcerting for Toledo and rumors swept through the city that the factory was going to close. These rumors were fueled by Jeep ceasing completed vehicle production, and shifting to kit manufacturing.

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[21] According to a local directory of employers, Champion employed 2,000 workers in 1986 (Ohio Manufacturers Directory 1986). This was the earliest year for which a local directory of employers was available. Sheller Globe had already closed by this year. Still, the closing of Champion represents a loss of at least 2,000 workers; the company may have employed more at peak operations.

[22] Dana Corporation would declare bankruptcy in 2006. This would result in a loss of nearly 800 non-manufacturing jobs in Toledo (McKinnon 2006). The company is now defunct.

[23] It is uncertain as to whether or not any of these employees were recalled.

The kits would later be exported to assembly plants in China and Venezuela while layoffs continued locally (Vernyi 1986b). In the 1990s, Jeep would increase the number of kits being produced in China and add an assembly plant in Viet Nam (McLaughlin 1994; Kisiel 1993). The start of kit production sparked a city-wide "keep Jeep" campaign that would intensify when Chrysler announced plans to build a new Jeep facility, but not necessarily in Toledo (Hallett 1986).

Toledo was able to retain Jeep. In July of 1998 Chrysler broke ground on a new $600 million Jeep facility. The new plant preserved nearly 5,500 automobile manufacturing jobs in the city (Pakulski 1998). In combination with its GM/Power Train Plant that still employed around 4,400, LOF's windshield manufacturing, and remnants of a struggling Dana Corp, Toledo was very similar to Flint by the end of economic restructuring. Large manufacturers in the automobile industry still dominated the local economy. This would not happen in the stable cities.

Large, mass producers in old industries were completely wiped out in Akron. As mentioned earlier, Akron was not deeply integrated into the metals industries, but it was tied to the auto industry through tire production. The city was home to the headquarters of four major tire producers: Goodyear, B.F. Goodrich, Firestone, and General. At the starting point of the economic restructuring period, these companies employed approximately 22,000 production workers (U.S. Census Bureau, Economic Census

1972).[24] From 1972 to 1982, all of these jobs would be eliminated and there would be no tire production in Akron (Koshar 1983).

In the early 1970s, responding to the downturn in the auto industry that hit Flint and Toledo, Akron tire companies started to lay off production workers. Around 4,000 workers were furloughed from 1972 to 1975. Possible recalls were announced during this time period, but in 1975 B.F. Goodrich crushed those hopes when it announced it would close its plant and no longer make passenger tires in the city (Stuart 1977). Goodyear was the next company to phase out its passenger tire production. It closed its manufacturing operations in Akron in 1979 (Koshar 1983). Firestone had two large facilities in the city. The first was closed in 1978, and the second, its truck tire building operation, shutdown in April, 1981 (Koshar 1980). A year later, General Tire announced its production facility would be closed before the year's end, officially ending all tire production in the city (Hoffman 1982). In a rapid phase of deindustrialization, the industry responsible for Akron's growth was gone. Equally disturbing to city leaders, while production jobs were being cut, the companies also decided to move their headquarters. In 1981, General Tire moved to a distant suburb. In 1986, Goodrich followed, and in 1987, Firestone moved to Chicago (Gertel 1987). Only Goodyear remains in Akron.

These changes had repercussions on other companies in Akron. The city had several steel plants that employed about 4,000 steel workers at the beginning of the

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[24] In total, these companies employed nearly 60,000. The production workers were phased out quickly. In the early 1980s, all rubber company layoffs involved white collar, salaried employees (Opplinger 1985).

economic restructuring period (Feldstein 1974). In the same way rubber was linked to the automobile industry, steel in Akron was linked to the rubber producers. As the tire facilities closed shop, the steel mills also collapsed (Giffels and Van Tassel 1998). With all of the rubber companies and steel mills closed by the early 1980s, the presence of old manufacturing in large, mass production facilities was virtually nonexistent in Akron.

Grand Rapids did not have as drastic a reorganization in manufacturing. In 1970, General Motors was the largest employer in the city. Grand Rapids also had some of its manufacturing concentrated into larger suppliers to the automobile industry, such as Doehler Jarvis, several steel mills, machinery companies, and metal factories. Grand Rapids also had several large furniture factories, which gave the city some diversity in the type of manufacturing being performed there. The furniture companies would survive economic restructuring and preserve the old form of manufacturing in Grand Rapids. The metals-based employers were not as fortunate.

In the early to mid-1970s, just as in the other cities, jobs were being cut at auto-related production plants in Grand Rapids. In 1974, 1,400 workers were laid off indefinitely at GM and the company announced it would eventually cut its productive capacity at the Grand Rapids facility by 25 percent (DeMaagd 1974a). The downturn in the auto industry also led to the complete shutdown of several auto-related manufacturers in the city, including Doehler Jarvis, Michigan Plating and Stamping, Hiram and Applied Parts, and Teledyne (Demaagd 1974b). The number of job losses due to each of these closings was not available, but overall, Grand Rapids went through waves of disinvestment in the 1970s that were comparable to the job losses in Akron and Toledo.

For example, in 1979, one of the worst years for layoffs and shutdowns for the city, Grand Rapids lost 5,000 manufacturing jobs (McCarthy 1980).

Layoffs and closings continued into the 1980s in the metals-based industries in Grand Rapids. Keeler Brass, Dennen Steel Corporation, Dexter Lock, Clark Equipment and National Steel, all metals producers or producers of metals-based products, shutdown, and GM continued to sporadically lay off workers into the early 1990s ("GM Layoffs" 1986; "GM Lays Off 384" 1986; "Two Steel Plants Closing Here" 1982; Limmer 1979). However, in the background of these losses, other major employers in Grand Rapids started to expand. This would lead to a shift in the type of manufacturing being done. By the end of economic restructuring, Grand Rapids had large, mass producers engaged in new types of manufacturing.

New Types of Manufacturing in the Large, Mass-Production Form:

In 1982, while employers in the auto industry and metals production were struggling to survive, Steelcase, a furniture maker in Grand Rapids, announced it would double its size and add as many as 5,000 new jobs in the next decade (Gryzan 1982). Part of its expansion plan was a new, $40 million, 650,000 square foot, manufacturing facility. This expansion was possible because Steelcase was benefiting greatly from the shift to a service-based, economy, which dramatically increased the demand for "office systems" furniture. Office systems are combinations of panels, partitions, and surfaces that can divide offices into smaller units. With the office population expanding, Steelcase's orders for office systems were increasing dramatically ("Steelcase Expansion to Add 800 Jobs" 1979). According to U.S. Department of Commerce figures, in 1975,

office systems furniture only accounted for a 7 percent share of the office furniture market. By 1984, that share had grown to 29 percent of all office furnishings sold (Brodsky 1985). Steelcase was a rare manufacturer that was benefiting greatly from the shift to the service-based, global economy.

Steelcase was not the only manufacturer in Grand Rapids that prospered during the period of global economic restructuring. American Seating, another furniture manufacturer in the area, took advantage of the boom in downtown sports stadium development. Starting in the 1980s, the seats in nearly every new professional sports stadium would be manufactured by American Seating (Meehan 1979). Rapistan started as a producer of conveyor belts, but as technology transformed how companies managed their supply chain, it became a manufacturer of "material flow" systems (i.e., systems for transporting, sorting, storing, tracking and delivery of finished products) (Aylsworth 1998). Bissell vacuum cleaners also expanded its manufacturing operations in Grand Rapids ("Bissell Expands" 1989). Finally, Amway, the maker of personal products and cleaners, prospered during this difficult period for manufacturers.

These companies did not simply grow because of unique opportunities afforded to them by the new global economy. They were also very engaged in research and development. Steelcase opened an R&D facility in 1986, where it not only tested new materials, primarily plastics, but also engaged in acoustic, ergonomic, and photometric research. The goal of the company was not just to provide desks and filing cabinets to new offices, but to transform the office environment (Turner 1986). Amway opened its research facility in 1981 to test materials for manufacturing, especially chemicals that

would go into their cosmetic and cleaning products (Gryzan 1981). Rapistan's R&D facility opened its "Technology Center" in 1997. The bulk of Rapistan's research focused on developing software that it could integrate into its materials handling systems to improve speed and precision (Aylsworth 1998). These facilities employed hundreds of skilled researchers, technicians and engineers, which provided Grand Rapids with the innovative potential to develop new products that could replace the old types of manufacturing.

Grand Rapids' ability to retain its large production facilities does make it somewhat of a unique case, but it is not completely different from Akron. Surprisingly, even though Akron lost its large, mass-production factories, it still retained research and development. Goodyear, the one tire company that kept its headquarters in the city, invested heavily into research and development. In 1980, it spent $75 million converting one of its old production facilities in the city into a new technical center. This technical center consolidates all of Goodyear's research and development activities in Akron (Koshar 1980). B.F. Goodrich also left its local research and development in Akron. Most importantly, these facilities collaborated with the University of Akron.

In the 1950s, the University of Akron developed a rubber chemistry program and worked closely with Goodyear researchers. In time, this program would expand, and today, it is the College of Polymer Science. The College of Polymer Science would collaborate with Case Western Reserve to form the Edison Polymer Innovation Corporation (EPIC). Through this program, a regional research and development infrastructure was established. The focus of EPIC was on products and processes that

could have commercial value for business (Cooper 1992). The combination of corporate and educational research and development provided Akron with te potential for new product development. Akron however, is different from Grand Rapids in that it does not have large factories that apply the research. Instead, it relies on smaller, skilled manufacturers. This will be discussed in greater detail below.

Not only are there no large, employers engaged in new types of manufacturing in the devastated cities, but the presence of research and development in these cities is weak. This is not surprising for Flint. It has always been a company town, and its main employer has demonstrated a weakening commitment to the city over the course of economic restructuring. On the other hand, Toledo is still home to the international headquarters of Owens-Illinois and Owens-Corning. These companies did undergo turbulent times, but they have both been cited as companies that have successfully adjusted to the new economy (Lane 1995; Stewart 1997). Given the apparent success of these companies, why does Toledo not show any progress in manufacturing?

Owens-Corning has always been committed to research and development. It has explored every possible use for fiberglass and it has tried to develop entirely new products for new markets. The location of its technical center though, is in Grandville, Ohio. This is more than 150 miles away from Toledo. Thus, not only does Toledo not have any O-C production, is has absolutely no local O-C related research and development. Toledo is just the place where corporate decisions are made, and except for the decision to build a new headquarters in Toledo, these decisions often go against the city. This has created a tense relationship between the company and city boosters. For

instance, in 1994, O-C announced it developed a new form of insulation that would revolutionize the home insulation industry. Toledo boosters were assured by O-C executives Toledo would be considered a possible location for the new production facility that would manufacture this insulation. Instead, when O-C announced its new invention it also declared production would begin in a week at a new plant it had recently built and staffed in secrecy near its technical center in Grandville (Pakulski 1994).

Owens-Illinois does have research and development in the Toledo area, but it is different from that found in Grand Rapids and Akron. First, while research and development activities have been expanding rapidly in the stable cities, since 1980, O-I continually reduced the size of its R&D by cutting its research-related labor force in Toledo. (Pakulski 2000; Brickey 1990; Brickey 1983; "O-I to Eliminate 35 Technical Jobs" 1982). Second, in 1982, O-I underwent an organizational restructuring phase in an effort to become a leaner, more efficient company. This involved de-emphasizing exploratory research on new product design in favor of developing methods to improve productivity. Therefore, O-I research is aimed at improving the quality of existing products, reducing energy costs related to production, and improving the speed of glass-making machinery. Finally, O-I adopted a "decentralized model of R&D" whereby each division of the company became responsible for its own research and development. With this move, researchers in Toledo no longer report to corporate leaders in the city but to division heads and plants all over the country (Brickey 1990). These changes have helped O-I retain its position as the leader in the production of glass bottles, but it has not helped the company move into new types of manufacturing in the Toledo area.

The difference in research and development has had an effect on the small, competitive manufacturers within the stable and devastated cities. These effects are discussed next.

Old Types of Manufacturing in the Small, Competitive Form:

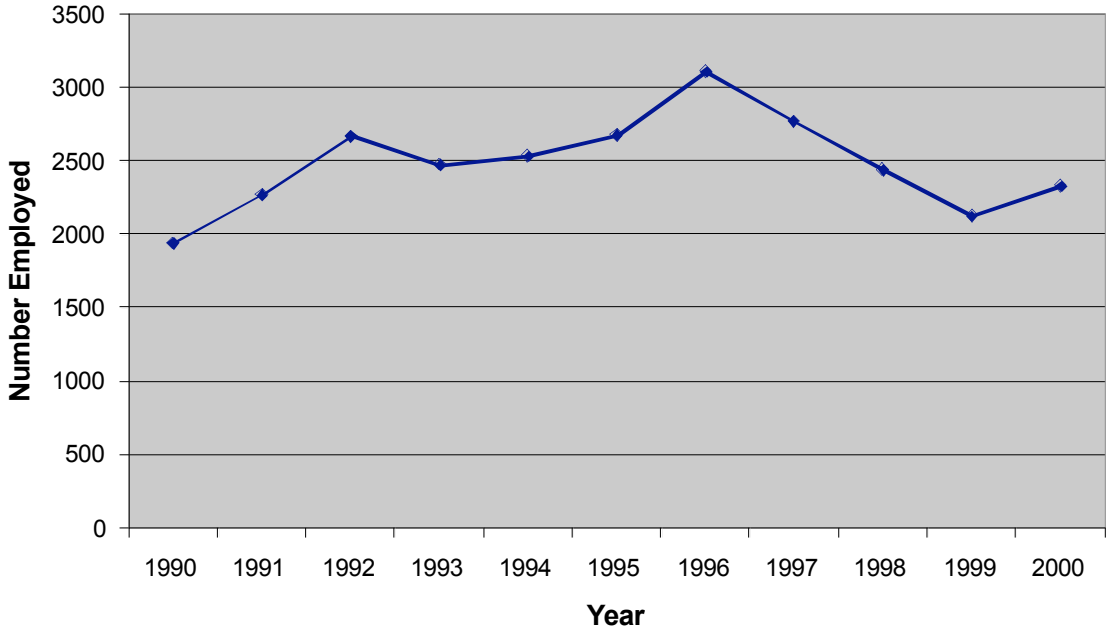
In Grand Rapids, small, specialty manufacturers have been recognized as an important part of the local manufacturing base. In fact, they have been cited as the driving force behind the city's manufacturing success (Czurak 1995). While some of the manufacturers are suppliers to the auto industry, others are critical resources for the development of new products. The tool and die makers and machinists work closely with the research and development facilities to help create new products. In Grand Rapids, the relationship between Steelcase and specialty manufacturers highlights the importance of these smaller producers. Steelcase started as a metal safe and file cabinet maker. However, the demand for lighter yet durable office furniture led to a transition from the metals to plastics. Steelcase relied on the specialty manufacturers to develop new plastic materials and new plastic parts that would help Steelcase make this transition (Interview 1/10/07a).[25]

This provided new work to local specialty manufacturers. As a result, these industries, such as tool and die manufacturing, have thrived. Figure 5.4 shows the growth

[25] With the shift to plastics production, it is somewhat inaccurate to assert these small manufacturers are still engaged in "old types" of manufacturing. Yet, these producers are not making materials for larger post-industrial markets, like biotechnology or computers either. In fact, a lot of early plastics manufacturing still went into the automobile industry.

in employment in the Grand Rapid's tool and die industry since 1990.[26] It indicates Grand Rapids had a strong tool and die industry in 1990 that grew by the end of the period of economic restructuring (*Book of Lists* 1990-2000).

Figure 5.4: Number Employed in the Tool and Die Industry, 1990-2000 (Grand Rapids)



Source: *Grand Rapids Business Journal, Book of Lists*, 1990-2000

The dip in employment that starts in 1996 is largely due to the collapse of Autodie. This company was a large supplier to the automobile industry that started to undergo financial problems in the early 1990s (Autodie Warns of Closing" 1992). Overall, Grand Rapids had a strong tool and die industry in 1990 that experienced growth.

[26] I created this figure using lists provided by the Grand Rapids chamber of commerce on local employers. Unfortunately, 1990 was the first year these lists were available.

The connection to local R&D also forced specialty manufacturers to update their technologies and learn how to handle new materials. To accomplish this change, they turned to one another for assistance in this transition. Collaboration however, was not spontaneous. An area local development organization, the Right Place, has been cited as a critical motivator for organizing Grand Rapids area industries. Through educational workshops and seminars sponsored by the Right Place, local skilled manufacturers had a forum to develop relationships with other similar companies. Company owners would utilize these relationships to assist one another in technology development and customer service (Hoekman 1998; VanderVeen 1994; Ververka 1992).[27] This transformed these industries into flexibly specialized systems.

Akron experienced a similar change. Interestingly, in 1979, a survey was conducted by a regional economic development organization of all Akron area suppliers to the rubber companies. Concerned with the impact of deindustrialization, the organization asked: "What happens to your company if rubber production leaves Akron?" The unanimous answer was, "Nothing, so long as research and development stays in the area" (Northeast Ohio Four County Planning and Development Organization 1979: 13-14). This is what has happened in Akron. The city had a strong foundation of small, skilled manufacturers that actually grew in the latter half of the economic restructuring period.

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[27] This is a simplified version of how these relationships between companies were formed. It did take a lot of outreach on the part of the Right Place and also required collaboration from local universities and corporate sponsors (Interview, 1/10/07)

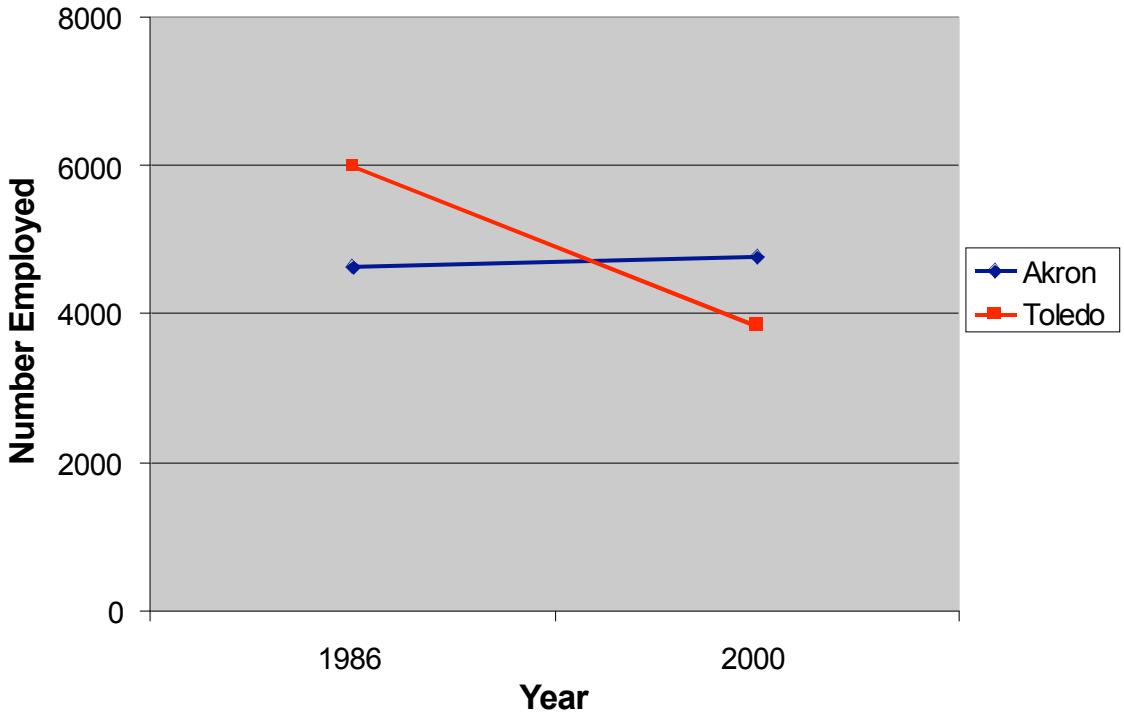
The small, manufacturers in Akron also started to produce plastic products. Researchers at Goodyear and B.F. Goodrich would develop plastic resins that their companies did not find useful, so they would separate from their companies, utilize the strong specialty manufacturing base, and form their own enterprises. Early plastics companies in the Akron area produced toys, kayaks, and plastic parts for cars (Fernandez 1992). Similar to small manufacturers in Grand Rapids, the change in materials required new technology and expertise. The Akron Machining Institute served the same role as the seminars designed by the Right Place in Grand Rapids. The Institute was an organization through which relationships between competing companies were forged. Small tool and die and machining companies would rely on these relationships to assist one another in technology development and customer service. It was not uncommon for Akron manufacturers to work together on developing new products for one customer (Interview 2/07/07b). Thus, the small, highly skilled manufacturers in Akron are also flexibly specialized.

Figure 5.5 shows the specialty manufacturing infrastructure that existed in Akron in comparison to Toledo from 1986 to 2000. It not only includes tool and die makers, but also fabricators, mold makers, and designers of specialized machinery.[28] The figure shows Akron had a strong foundation of skilled manufacturers in 1986 that experienced a

[28] I was able to identify these additional skilled manufacturers because the directory of employers I used to create this figure listed the specific products each manufacturing establishment made. This allowed me to identify additional skilled manufacturers beyond tool and die makers. I examined the products made by each manufacturer to identify those that produced new specialized products, such as plastic mold cavity pressure equipment.

slow rate of growth to 2000. On the other hand, Toledo had a strong foundation but lost a substantial number of employees by 2000.

Figure 5.5: Number Employed in High-Skilled Specialty Manufacturing (Tool, Die, Molding, Specialty Machinery, & Fabricators), 1986-2000



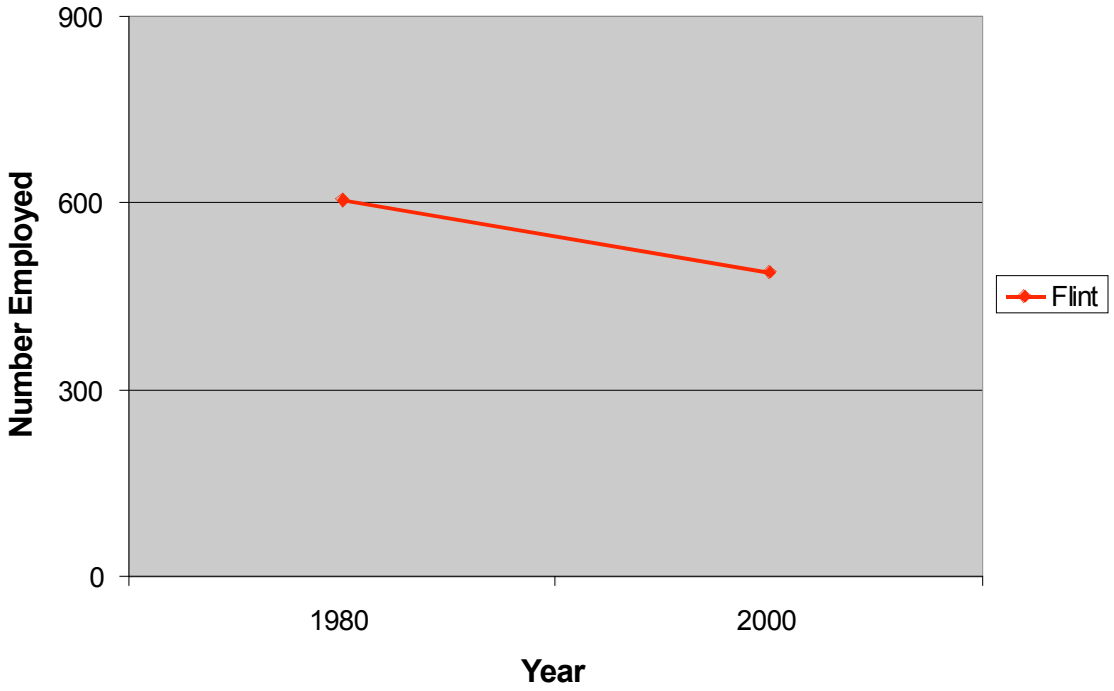
Source: *Ohio Manufacturer's Directory,* 1986-2000.

As mentioned above, the presence of R&D is not as strong in Toledo as it is in the stable cities. Additionally, the research and development it does have is not oriented to new product development. It is through the creation of new products that specialty manufacturers maintain their livelihood. Thus, it is not surprising that Toledo has seen its employment in skilled manufacturing slide. Toledo continues to have a sizeable number of workers employed in these high-skill industries, but they are concentrated in larger

automobile suppliers. Since Toledo has maintained automobile manufacturing it has also retained some supply work. In fact, Chrysler's announcement that would build a new Jeep plant in the city helped Toledo attract new suppliers (Pakulski 1999; Chavez 1998). Interestingly, several Japanese auto suppliers have also moved into the Toledo area. The city's close proximity to Detroit and to several Japanese transplants in the Midwest has made it an attractive site for foreign auto suppliers (Warner 1988; "Company Profile" 1988). These new auto suppliers provide Toledo with a sizeable labor force in specialty manufacturing, but it is strongly linked to automobiles and still involved in metals-based production.

In Flint, specialty manufacturers are virtually nonexistent. Figure 5.6 shows the specialty manufacturing infrastructure in Flint was never strong, and from 1980 to 2000 employment in skilled manufacturing decreased.

Figure 5.6: Number Employed in High-Skilled, Specialty Manufacturing in Flint (Tool, Die, Molding, Specialty Machinery & Fabricators)



Source: *Harris Industrial Guide*, 1980-2000.

The presence of General Motors actually stifled the development of strong tool and die, machinery, and specialty fabrication industries in Flint. First, GM often stole workers from the small, specialty manufacturers; the small shops could not compete with the wage scales and benefits offered by GM. As a result, the shops served as training facilities for technicians that would eventually leave for GM (Noble 1986). Second, in the early 1990s, GM demanded price concessions from its suppliers ("Auto Suppliers Attempt to Meet New Challenges" 1992). With this change, GM also severed ties to local suppliers and introduced competitive bidding for parts contracts. Not only did this intensify competition between local firms, but now Flint suppliers had to compete with suppliers across the country for business from GM, their largest local employer

("Supplier/Buyer Relationships Changed" 1994). Many smaller shops in the city could not compete with larger companies and shutdown. Others lost contracts and tried to diversify into other markets to not be so reliant on GM. Despite these efforts by local specialty manufacturers, their main client remains GM, and as a result, they continue to produce metals-based products for the auto industry (Mason 1991).

The inability of the devastated cities to retain or attract research and development and to combine it with a strong infrastructure of specialty manufacturers has blocked them from developing any post-industrial manufacturing. Conversely, Akron and Grand Rapids have made strides towards becoming post-industrial manufacturers.

New Types of Manufacturing in the Small, Competitive Form:

The presence of research and development combined with a strong infrastructure of specialty manufacturers creates a transformative environment in which spinoff companies are possible. In Akron, early spinoffs from Goodyear and B.F. Goodrich research in Akron were plastic companies. For example, in the early 1980s, a new plastic resin was developed that could be used to form stiff and durable plastics. A couple of researchers saw the potential in using this product to form very large and odd-shaped products inexpensively. They combined this new material with an old form of molding technology, rotational molding, to produce plastic picnic tables, slides, and jungle gyms for children. The toy company, Little Tikes, was born (Fernandez 1992).

Currently, Akron is working to expand research and development beyond plastics, which is a hard form polymer. Polymers are materials that are found naturally in plant and

animal tissues, and represent such materials as rubbers, adhesives, and fibers. Essentially, they are "strings of chemical units linked in long intertwining chains" (Paynter 1983). Through the rubber research that has been concentrated in Akron, researchers have found ways to manipulate polymers into other unnatural forms that may have incredible market potential. Political, economic, and community leaders believe that with the right publicity, Akron can develop an agglomeration economy around polymers similar to that in Silicon Valley. The research facilities that have developed around polymer research and the infrastructure of skilled manufacturers are expected to act as magnets for luring other scientists and manufacturers (Interview 1/29/07; Interview 1/30/07a; Interview 1/30/07b).

The markets Akron polymer researchers and manufacturers are particularly focused on exploiting are the life sciences and computer industries. As mentioned above, plastics are a hard polymer, and its development has allowed Akron to get its foot in the door as a manufacturer of life sciences products. Plastic syringes and specialized packaging materials have been produced in Akron. However, it is in the development of soft polymers that Akron sees its future in the life sciences. Soft polymers, like rubber, have been manipulated into artificial organs and limbs. Researchers see polymers being used one day as "anchoring agents for the controlled release of drugs, for artificial body membranes, and even synthetic blood" (Paynter 1983). Wound care is another area that Akron has concentrated a lot of research. BFGoodrich's Wound Care Products Department has created wound dressings that heal wounds faster. The commercial application of this technology is the invisible Band-Aid, and advanced wound dressings

that have been supplied to the military ("Ohio-Based Polymer Research Consortium Grants Wound Care License to BFGoodrich" 1990). The extension of this research has been in the production of synthetic skin. The work on skincare has made Akron area hospitals some of the best for burn treatment (Interview 1/30/07a).

Computer equipment is another industry Akron is actively trying to strengthen. Area businessmen and political leaders understand that they will not supplant other tech regions in the country, such as Silicon Valley, but they have developed polymer fibers that have improved efficiency in computers and electric transmissions generally (Paynter 1983). Researchers at the University of Akron have also collaborated with liquid crystal engineers from Kent State to develop new monitor screens for the computer industry. The advantage of these screens is that there size and shape can be manipulated. For instance, one of the screens can be rolled up and unrolled like a small movie screen (Interview 1/29/07).

Slowly, Akron has been realizing the benefits of polymer research and product development. Small research firms have located into the Akron area. Several companies produce new polymer resins and there are many resins processing companies. Overall, Akron employs over 30,000 in more than 400 polymer-related businesses (Milbank, 1995). The next phase of Akron's development is to connect its four hospitals downtown and the University of Akron's Polymer research facilities into a downtown "medical alley." This medical complex will be less than five city blocks from the region of the city that has grown with new, small, polymer-based companies (Interview 1/30/07c).

Grand Rapids also sees its future in post-industrial manufacturing for the life sciences. Interestingly, while Akron has had to lure manufacturers to accompany its strong base in advanced research, Grand Rapids has had to do the opposite. Grand Rapids' strong plastics industry developed from research and development of new office systems. Many specialty manufacturers creating advanced plastic products for office furniture branched out to develop syringes, parts for medical devices, medical instruments, and sanitary packaging (Ververka 1990). Simultaneously, Steelcase saw its future not just in office furniture but in designing work space in general. What Steelcase was particularly focused on was how it could move from designing systems for offices to designing systems for research labs, and different medical facilities. New research went into clean room technologies, room temperature systems, and lab furniture (Interview, 1/11/07).

The Right Place, the aforementioned development organization, noticed this development and called these medical suppliers together to gage future needs to help the industry grow. The Right Place also talked local manufacturers into forming the Michigan Medical Device Manufacturers and Suppliers Association (Ververka 1992; 1990). The purpose of the association is to encourage collaboration between local manufacturers in the life sciences to create the flexible production networks similar to those found in other high-tech regions, specifically Silicon Valley (Convissor 1994; Calabrese 1994). However, while Grand Rapids was developing the infrastructure to develop new medical products, they were lagging in medical research. The corporate R and D provided by large employers was sufficient to pull Grand Rapids out of the

vulnerable metals and into new plastics-based manufacturing, but without a major university, Grand Rapids did not have the same advantages as Akron.

This concern was expressed by local producers when the Right Place surveyed the medical device makers. Immediately, efforts were taken to lure research into the Grand Rapids area. Fortunately, Grand Rapids was able to lean on a rich tradition of corporate philanthropy to build a base for medical research. In 1996, plans were announced for the formation of the Van Andel Medical Institute (VAI). The center would be dedicated to cancer research and it would be linked to the Michigan State medical school in Lansing (Gehring 1996). The Right Place immediately commissioned a study to determine the impacts VAI would have on the city. In particular, the organization wanted to know how discoveries made at VAI could be converted into marketable products. One of the findings was the maintenance of a strong specialty manufacturing infrastructure, which Grand Rapids had in place, needed to be maintained (Hoekman 1998b).

On May 10th, 2000, the Van Andel Institute opened in Grand Rapids to mark the beginning of the city's "Biotech Era" (Hoekman 2000). The research center started with twelve scientists, two senior-level and ten regular, forty-four scientific support personnel, and fifteen administrators. VAI has since expanded and Michigan State has decided to strengthen its collaboration with the research center by moving the medical school in its entirety to Grand Rapids (Interview 1/10/07b). The school is currently being constructed next to the Van Andel Institute. Much like Akron, the hopes are for an agglomeration economy in the life sciences.

In devastaed cities, there is no sign of manufacturing progress similar to the experiments underway in Akron and Grand Rapids.

Conclusion

In this chapter I examined how manufacturing changed in specific cases over the course of economic restructuring. I focused on changes in types of and forms of manufacturing. These detailed changes were overlooked when I examined sector-level employment change, and they are overlooked by current research on deindustrialization. Yet, there are very important differences in how manufacturing changed in type and form in my stable and devastated cities. These changes provide insight into how Rust Belt cities can rebound from industrial decline and find a niche in the global economy.

As expected, manufacturing in my devastated cities did not change in type and form. At the starting point of economic restructuring, manufacturing was concentrated in large automobile factories. At the end of economic restructuring, auto factories continue to be the main employers in each city. However, there are a couple differences between Flint and Toledo. Flint is a city that is desperately holding onto old GM facilities. The only change it has experienced is massive cuts in employment. Toledo has also experienced substantial job cuts in the auto industry, but Chrysler committed to building a new Jeep facility in the city. This may provide Toledo with some security, as Chrysler is less likely to close a brand new facility in the near future. The new plant in Toledo has also kept suppliers in the area alive and even lured some new suppliers. Thus, Toledo has an infrastructure of specialty manufacturers that Flint does not have. These companies

are auto-industry suppliers though, and as such, they are still working with metals. Flint and Toledo have not progressed out of vulnerable, metals-based production.

My stable cases have transitioned out of the metals-based industries and their manufacturing is beginning to take a new form. Both Grand Rapids and Akron have made larger strides toward becoming flexibly specialized, post-industrial manufacturers than I expected. However, this transition is not complete and it appears to be an end point in a process of change that I did expect. I anticipated manufacturing in these cities to have progressed beyond old types in the mass-production form. Specifically, I believed their local economies would be defined by small, craft manufacturers or large companies making new products. In fact, these two appear to combine and make the development of a post-industrial manufacturing economy possible. At least, this is what is shown by my case studies.

Both Grand Rapids and Akron had a strong infrastructure of small, specialty manufacturers that actually grew over the course of economic restructuring. They grew because they were given new work by large companies that were very active in new product development. The companies had local R&D facilities that relied on local specialty manufacturers. The local R&D did differ somewhat in Grand Rapids and Akron. Akron's large companies formed a relationship with the local university, which provided Akron with the educational base associated with the global economy's innovation centers. Interestingly, Grand Rapids would eventually import this. The point however, is the catalyst for change was corporate R&D, which is often overlooked, as universities become a larger and larger presence in the service-based economy; a remnant

of deindustrialization was actually the building block for new manufacturing. In fact, the small manufacturers are also remnants of the old type and form of manufacturing. In combination, innovative environments were created that made integration into the global economy as post-industrial manufacturers possible for Akron and Grand Rapids.[29]

These changes in manufacturing have an effect on the service employment in these cities. This is the topic of the next chapter.

[29] Another stable case I examined is Worcester, Massachusetts. When examining sector-level data, it has lost a substantial amount of manufacturing employment, making it seem like a typical deindustrialization story. When examining manufacturing change in detail, and the manufacturing that still remains in Worcester, it too combines corporate R&D (Hoover Vacuums and Glidden paints) with a strong and growing specialty manufacturing base. It is a city that is exploiting biotech markets with the manufacturing of biochemical reagents and MRI technologies.

CHAPTER 6: BUSINESS AND PROFESSIONAL SERVICES IN SPECIFIC STABLE AND DEVASTATED CITIES

In this chapter I examine changes in service sector employment. In particular, I focus on employment growth in business services and professional services. Earlier analyses indicate employment growth in these two sectors distinguish stable and devastated cities. Using the same archival materials and interviews I used in Chapter 5, I provide a detailed description of what these services are and how they developed differently in my stable and devastated cases. Since I employ the same methodological strategy I used earlier, I do not provide an additional review of my methods. Thus, this chapter consists of only two main sections.

In the first section, I focus on business services. Employment growth in these services separate stable cities from devastated cities. At the end of chapter 3, I identified major business services employers in several stable cities in order to discern exactly what these services are. I concluded employment growth in this sector likely means a city has captured back office work in data processing or information production for large companies. Upon closer examination at the case-level, I find changes in business services are linked to changes in manufacturing. Additionally, it is not large employers in data processing and information production that separate the stable cases from the devastated cases, but rather, small computer software and consulting companies.

In the second section of this chapter I examine how employment in professional services has changed in my case studies. Earlier analyses indicate employment growth in professional services distinguishes devastated cities from stable cities. Throughout the

dissertation, I have suggested employment growth in this sector reflects hospital growth. My cases confirm this. While all cities have experienced employment growth in health-related industries, devastated cities in the Rust Belt have experienced massive hospital expansion. In the second section of this chapter, I detail this expansion and offer reasons for why devastated cities have experienced greater employment growth in the hospital industry.

Business Services in Stable and Devastated Cities

Scholars have debated whether or not a healthy manufacturing sector is necessary for the development of a producer services economy. While some assert manufacturers are the primary consumers of business services, and therefore, necessary for their development, others argue corporate headquarters are sufficient for driving the growth of high-end services (Drennan 1992; Markusen and Gwiasada 1991; Sassen 1991; Noyelle and Dutka 1988). In my cases, the connection between corporate headquarters and business services growth was not clear, but I was only able to acquire limited information on larger companies headquartered in Grand Rapids and Toledo. In Grand Rapids, a stable city, Steelcase and Amway performed some of their business services, such as advertising and data processing, in house. Amway even imported service work, as it handled some advertising for General Motors (Murphy 1987). On the other hand, the larger, international companies headquartered in the devastated city of Toledo, Owens-Corning and Owens-Illinois, reported outsourcing their services to larger, non-local providers ("REMEDI Consulting Co. Nets Contract With O-C" 1999; "Deal With O-C Brings HP Office to Toledo" 1994). While these differences are interesting, from the

quality of the information available I could not determine with certainty how corporate headquarters affect the local business services sector.[30] However, I did find evidence in support of the argument that a strong manufacturing sector acts as a springboard for local business services growth, especially in computer-related services.

In the late 1980s, coinciding with the development of new plastic products, the specialty manufacturers in the stable cities started to update their technologies (Shusta-Walkes 1988; Interview 1/23/07). Manufacturers began to utilize computers to improve their product design and development capabilities and also to coordinate different organizational functions, such as processing product orders and keeping inventory. Computer Aided Design (CAD) software became essential for manufacturers to design and develop new products. CAD systems range from simple two-dimensional drafting and three-dimensional modeling software to specialty packages for niche users. Computer Aided Manufacturing (CAM) software is often integrated into the CAD software (CAD/CAM), allowing manufacturers to move quickly from design to the development of product prototypes. These software programs became necessary tools for specialty manufacturers to remain competitive in new industries where the new product development cycles are much more rapid than in the old metals-based industries.

Manufacturers were not only speeding up their design and production capabilities, but they were also implementing software packages to improve the efficiency of ordinary

[30] Even though Steelcase and Amway performed some services in house, I do not know if this employment was classified as business service employment in the census figures used in previous chapters. I also could not find information on how this may have changed for these companies over time. Perhaps, as they expanded, they followed the example of O-I and O-C. Unfortunately, I could not acquire this information.

business functions, such as processing orders and shipping products. Common software packages that manufacturers started to utilize for these purposes were Electronic Data Interchange (EDI), Material Requirements Planning (MRP), and Enterprise Resource Planning (ERP) software. EDI allows the computer-to-computer exchange of business documents and is especially useful for coordinating orders for shipment. Planning software is much more advanced. Planning software processes product orders from clients, calculates the amount of raw materials needed to produce the product to fill the order, places an order for the raw materials, tracks the delivery of raw materials from the suppliers, coordinates the distribution of raw materials onto the shop floor, monitors the production process, and tracks the shipment of the final product to the cutomer. With planning software, manufacturers are informed of where the company is in the process of filling an order at all times. The company is also able to perfect its own orders of raw materials and their handling to eliminate waste in the production cycle.

In the stable cities, computer service companies specializing in the development and installation of these types of software drove local employment growth in business services. In Grand Rapids, the implementation of specialized design and organizational software packages was initially handled by IBM. However, as IBM business associates formed relationships with local manufacturers and came to understand their specific needs, many broke away from their parent company to start their own businesses (Calabrese 1993a). The small, specialty manufacturers working in plastics and in the office systems industry provided these start-ups with a considerable amount of business. From 1988 into the early 1990s, implementation of EDI in manufacturers in the Grand

Rapids area grew at 40 percent a year (Stempack and Richards 1991). Additionally, specialty manufacturers of products for the office systems companies began to use design software in place of models. With the software, manufacturers were not only able to develop new products but also situate them in virtual office spaces of different sizes to visually represent how the products would appear in actual environments. Essentially, manufacturers started to develop blueprints of office spaces with the help of computer technology (Luyumes 1991). Local computer service providers were relied upon to install the new software, train manufacturers how to use it, and maintain the computer service needs of the manufacturers. Later, these computer service firms would be cited by manufacturers as an important resource and one of the main reasons production remained in the Grand Rapids area (Molinari 1998).

In Akron, some of the new software companies developed as spin-offs of larger computer service companies, such as IBM, but also, a former Goodyear production facility was transformed into a local high-tech incubator. The incubator produced many new computer service start-ups that targeted manufacturers as clients (Interview 1/30/07a). Again, the ability to quickly move from design to development using new computer technologies was in demand by specialty manufacturers working with new plastic materials. These manufacturers fueled computer service growth in the Akron area (1/30/07b).[31]

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[31] Unfortunately, small business services companies did not receive much publicity in the local paper and business journal in Akron. I had to rely on interviews to assess whether or not they were present in the city and economic census data. The economic census data confirms Akron has a strong infrastructure of small computer service providers (see figure 6.2).

In the devastated cities, small, computer software companies specializing in design and organizational software did not develop. In Flint, General Motors was again an obstacle to the development of new employment. It was the main manufacturer in the city and relied on non-local suppliers for technological upgrades (Interview 1/17/07a). The other local manufacturers, who were mainly suppliers to GM, simply failed to upgrade their technologies.[32] In 1989, a study of technology in the Flint region conducted for the Flint Area Chamber of Commerce and funded by the C.S. Mott Foundation showed Flint area manufacturers were slow to implement new technologies. Specifically, local companies were not using CAD/CAM software, which "decreased their ability to compete with other manufacturers in the region" ("Area Manufacturers Need to Upgrade Technologies Study Shows" 1989). Particularly disturbing to the Chamber of Commerce, local companies surveyed for the study had no plans to implement new computer and software technologies in the immediate future. This failure to upgrade technologies would later be reflected in employment trends. A study conducted two years later by GEAR, a Flint area economic development organization, showed Flint lacked high to mid-wage service jobs, specifically computer programmers, systems developers, and consultants (Mason 1991). Basically, Flint lagged in employment growth in the business services.

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[32] In two interviews with members of a local economic development organization, interviewees suggested local suppliers did not upgrade their technologies because they believed their business with GM was secure. They did not expect the introduction of competitive contracting and believed longstanding business relationships with GM would be valued over cost savings the company would accumulate by switching to new, cheaper vendors.

Local business journal reports provide additional evidence that Flint area employers were slow to adopt emerging technologies. From 1986 to 2000 the local business journal produced a list of participants of the annual Flint area business fair. All major companies in Flint attended the fair and the journal provided a brief description of each. Companies offering computer services were not listed until the late 1990s. However, the new computer-related companies did not specialize in the development, implementation, or maintenance of new software. They were simply retailers. Besides the annual lists, the local business journal also provided a "Technology Section," that featured technological innovations that could be useful to local manufacturers and other businesses. Throughout the 1990s, telephone technology was featured, including car phones, debit card phone services, and videophones ("This is No Dumb Computer" 1998, "Tech News" 1994). In 1996, computers were finally recognized as a useful resource for local businesses and the lead story in the Flint area business journal was entitled, "The Computer: How do You Learn How to use It?" (1996). Overall, business journal reports highlight the failure of local businesses to adopt new technologies and provide no indication of a business services infrastructure in Flint.

Toledo is similar to Flint in that local business journal reports on new technological innovations concentrated on telephone-based products throughout the late 1980s and the 1990s ("Tech News" 1998, "LiTel Corp Introduces New Business Service" 1985). In fact, in the mid-1980s, when manufacturers in Grand Rapids and Akron were implementing EDI and advanced design software, a data storage company that stored

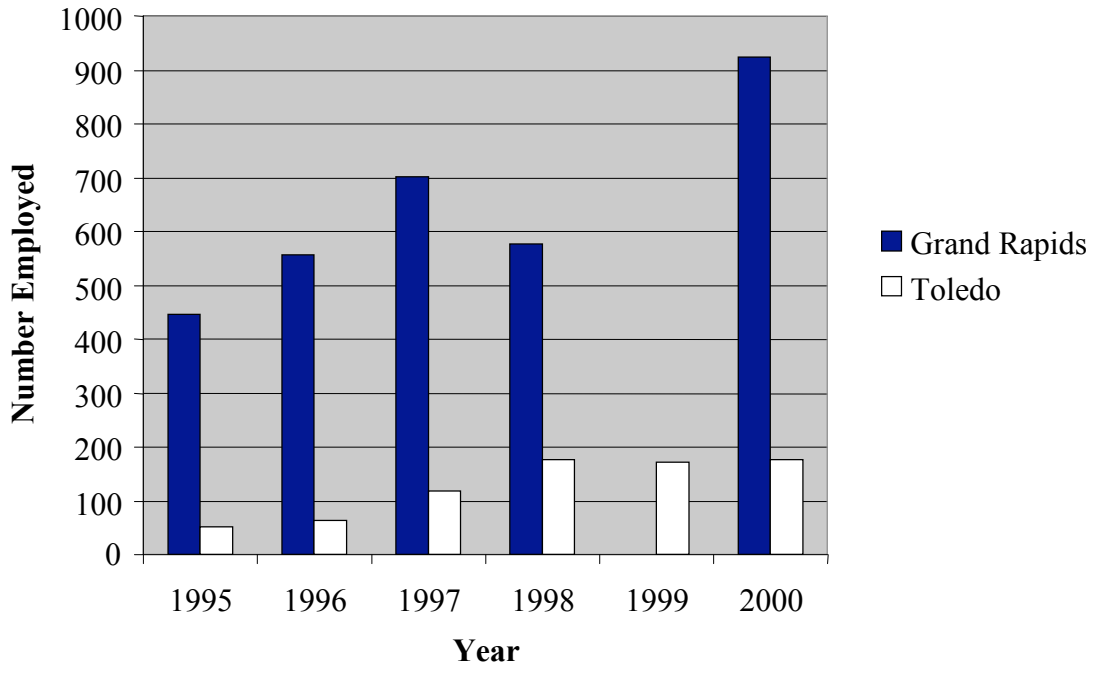
data in vaults opened in Toledo, signaling the lack of technological sophistication in the city's business service sector ("Leonard Bros. Opens First Area Storage Vault" 1985).

Toledo did have a high-tech incubator, but it was not as successful as Akron's and closed in the mid-1990s (Interview 2/6/07; Interview 2/7/07a). The business services companies that did develop through the incubator mostly focused on the retail industry (Hassen 1987). Thus, Toledo had a variety of point-of-purchase companies and providers of accounting software. The software and computer services provided by these companies focused on payroll services for local restaurants, auto suppliers, and hospitals ("Toledo Firm Offers Computer Solutions" 1994; "Toledo Computer Center Specializes in Payroll Work" 1989).

The providers of design and manufacturing software in Toledo were not private companies but rather the Edison Center, a state-run organization, and the University of Toledo. The Edison Center was part of a state-level program designed to encourage new manufacturing in Ohio cities. At the Edison Center, manufacturers could lease computer-assisted product design and testing machines on a time-share basis with other local manufacturers ("Edison Center Acquires Industrial CT Unit" 1990). At the University, a $1 million grant from IBM was used to develop the National Center for Tooling and Precision Parts. The Center was expected to be a technology hub for local manufacturers, but its main goal was training specialty manufacturers for jobs in the northwest region of Ohio. It offered classes in CAD/CAM design and other specialty design and manufacturing programs. Outside of these two centers, there were no clear providers of computer-based services or software developers for manufacturers in the Toledo area.

In 1995, the local business journal in Toledo began providing annual lists of employment in different industries. These lists allow for a comparison of employment in software development companies in Toledo and Grand Rapids. The local business journal in Grand Rapids produced a similar book of lists starting in 1989.[33] The local chambers of commerce in each city compiled the employment statistics, which only include employment in the central city. The comparison between these two cities is shown in Figure 6.1 below.

Figure 6.1: Number Employed in Software Development Companies, 1995-2000 (Grand Rapids vs. Toledo)

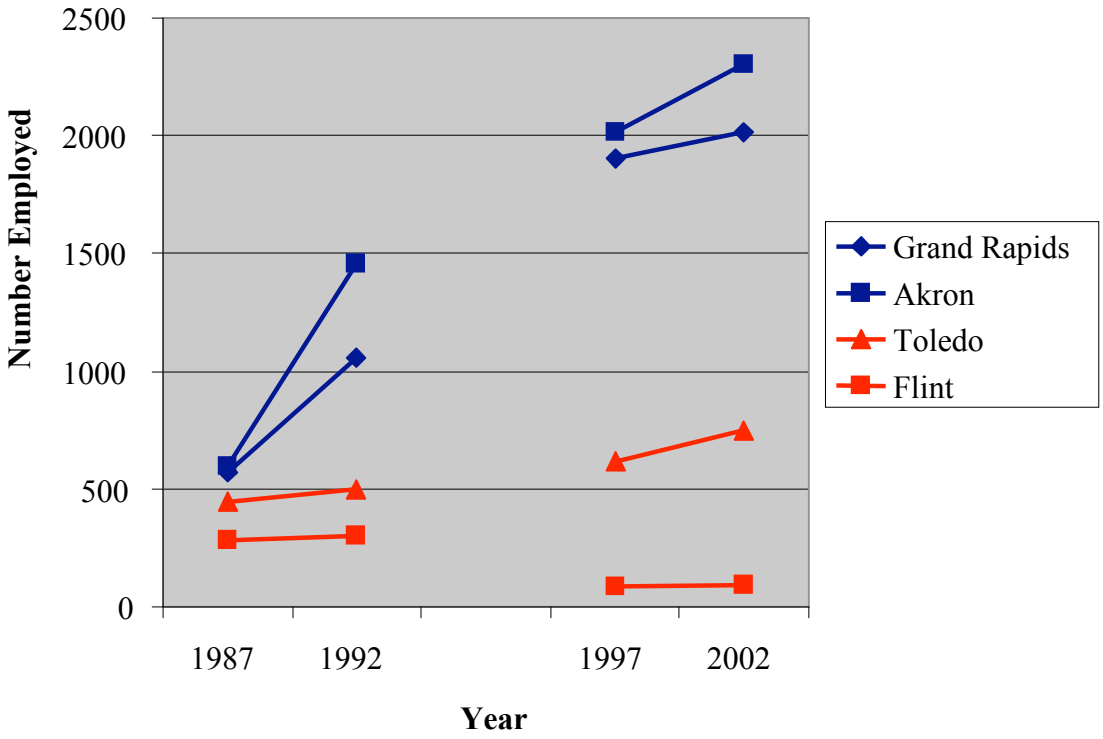


[33] The list for software developers was not included in the 1999 Grand Rapids *Book of Lists*. Thus, no employment is provided for Grand Rapids in this year in Figure 6.1.

The figure shows Toledo had a very weak infrastructure of business services providers in software development. On the other hand, Grand Rapids had a strong infrastructure that experienced steady growth. Again, these software developers drove business services growth in the stable cities by providing specialized software and computer services to manufacturers in new growth industries.

In figure 6.2 below I use Economic Census data to compare employment in computer services in the stable and devastated cities.

Figure 6.2: The Number Employed in Computer-Related Services, 1987-2002



Unfortunately, the industrial classification codes used in the Economic Census changed after 1992. As a result, the data from 1997 to 2002 is not comparable to that

from 1987 to 1992. Nevertheless, the Census figures are informative. From 1987 to 1992, the time period over which manufacturers reported the implementation of technological upgrades, the stable cities experienced marked employment growth in computer-related services. In the devastated cities, where there was a weak manufacturing sector that was slow to upgrade technologies, there was little employment growth in computer related services. From 1997 to 2002, it is clear that the stable cities have a much stronger business services infrastructure in computer-related services than the devastated cities. In fact, Flint's computer services industry is virtually nonexistent.

In sum, the employment growth in business services that distinguishes stable cities from the devastated cities is concentrated in computer-related services. The development of these services was closely tied to manufacturers upgrading their technologies in the stable cities. In the devastated cities, there was a weak infrastructure of specialty manufacturers. Additionally, those that did exist in the devastated cities were slow to implement new design, manufacturing, and organizational software.

Professional Services in Stable and Devastated Cities

Employment growth in the professional services distinguishes devastated cities in the Rust Belt from stable cities. Actually, over the course of economic restructuring, all cities in the region have experienced employment growth in the professional services, but the growth has been much greater in the devastated cities. The new employment is in the hospital industry. Across the country, hospitals have become major employers in urban areas and the Rust Belt cities are no different. Why though, do hospitals experience greater growth in devastated cities than in stable cities? In this section, I answer this

question by describing the different circumstances that surround hospital growth in the stable and devastated cases.

Hospitals have expanded as newer medical technologies and services have become available to patients. How hospitals have responded to financial constraints has also determined their growth. An overview of how the healthcare industry has changed is beyond the scope of this chapter, but a notable change that impacted hospital growth was the transition away from the fee-for-service system in the early 1980s. At this time, the federal government overhauled the way it paid for Medicare. Instead of being paid the rates charged for services rendered, hospitals were paid a flat rate that could be adjusted, depending on the diagnosis and the treatment. If hospitals could provide services for under the flat rate, they were profitable. If they could not, they lost money (Frezza 2005; Interview 1/31/07a). With this change, hospitals pursued a variety of strategies to cut costs, including, collaborating with other hospitals in loosely knit affiliations or mergers; developing outpatient or ambulatory care facilities to reduce costly in-patient services, and collaborating with insurance companies to sell services regionally (Gamboa 1993).

The response to these changes by hospitals in Grand Rapids is different than the other cities. Grand Rapids had four hospitals at the start of economic restructuring. After medical payment legislation was passed and fixed rates were instituted these hospitals responded by pledging cooperation in the delivery of services. The hospital CEOs and board members operated under the philosophy that the healthcare industry was a unique market in which competition would actually drive up costs by producing redundant services (Czurak 1995). Redundant services, such as two hospitals having their own no-

natal intensive care units, were viewed as a problem by hospital administrators because they believed the demand for these services was fixed. Two hospitals trying to outbid one another to provide neo-natal intensive care services at a cheaper cost did not necessarily translate into consumers utilizing these services at a greater rate. Instead, hospital administrators in Grand Rapids believed a more likely scenario would be that each hospital would be burdened with operating two neo-natal intensive care units at a lesser capacity. This could only drive healthcare costs up.

Following this philosophy, the growth of the hospital industry in Grand Rapids was carefully planned. In 1986, the two largest hospitals in the city, Metropolitan and Butterworth, signed an agreement to engage in joint ventures in order to reduce redundant services (Calabrese 1995). These two hospitals merged in 1996, which was more an affirmation of their long standing collaborative efforts than a survival tactic to acquire more patients. To decide future service and facility needs, the CEOs engaged in discussions on what new services were necessary and who should have them (Calabrese 1993b). Additionally, a joint group from the board of each hospital was created. The group was formed to ensure that community needs were considered when hospital boards decided to build new facilities or invest in cost-intensive services (Calabrese 1994).

The overwhelming degree of collaboration between hospitals in Grand Rapids did not likely stem from shared philosophies by administrators on competition and collaboration in the healthcare industry alone. It is clear local businesses also exerted pressure on the hospitals to cooperate. For instance, Amway was particularly active in monitoring healthcare costs and contracted outside research firms to conduct studies on

how these costs changed in the city's hospitals over time (Calabrese 1993b). The pressure exerted by local businesses on hospitals was clear in comments made by the CFO after the city's two largest hospitals merged. The CFO noted:

> It is imperative this community align the cost reduction incentives and do it differently than in other parts of the country if we want to ensure we that we are going to have manufacturers here…In my home area of New England we lost a lot manufacturing to other parts of the country because it was just too expensive to do business there. We recognize we have a responsibility to the community. It's a complicated task, balancing the healthcare needs of the community with the costs of those needs (Hoerman 1999: A1).

Due to the cooperation between hospitals, Grand Rapids had one of the slowest rates of employment growth in professional services. Expansion of hospitals and other healthcare facilities was contained. It is important to note however, that it is unclear as to whether or not collaboration works better than competition in driving down healthcare costs. This is widely debated in the hospital industry. However, collaboration between hospitals certainly stifled employment growth in the professional services in Grand Rapids.

Akron did not follow a collaborative model of hospital growth. In fact, the city's hospitals were fiercely competitive. Akron also had four hospitals. Two merged to become the Summa Health System, which collaborated with Children's Hospital (Lore and Sandstrom 1996). Akron General stood alone. Throughout the early 1990s Summa and Akron General were fierce competitors. If Akron General opened a chest pain center, Summa would do the same. If Summa purchased an expensive piece of equipment, such as a magnetic resonance imaging (MRI) unit, Akron General would purchase one as well. Additionally, the two hospitals fought to block one another's expansion plans (Gamboa 1995a, 1995b, 1994a, 1994b). A particularly contentious

battle was fought for a new burn unit, which the state eventually granted to neutral Children's Hospital. From 1990 to 1993 the two hospitals had invested $140 million dollars in renovations and expansions (Gamboa 1993).

Whereas Grand Rapids hospitals avoided redundancy in services, Akron hospitals engaged in a hospital arms race. Each new unit required new staff, medical assistants, technicians, and doctors. However, the employment growth was not as great as the expansion reports suggest. Akron hospitals also pursued expansion strategies that did not increase local professional services employment. For example, Summa formed strategic alliances with Cleveland hospitals and clinics. The alliance involved the referral of patients between the hospitals, which supposedly brought more patients to both hospitals (Gamboa 1994c). Akron General acquired ambulatory care facilities in neighboring cities and suburbs outside of the Akron metropolitan statistical area (Lore 1997). These strategies gave Akron hospitals access to more patients without the development of local facilities that would drive up local employment growth in the professional services. Also, some hospital plans were blocked. As in Grand Rapids, local employers did exercise a certain degree of control over hospital expansions. The business community, led by Goodyear and Ohio Edison (utility provider), closely monitored hospital activity and commissioned studies on healthcare costs. They bargained for lower costs, which checked the spending and expansion behavior of the hospitals (Gamboa 1995c, 1994d).

The scale of hospital expansion in the devastated cities far exceeded that in Grand Rapids and Akron. In both of the devastated cities, the major employers that had built large hospital systems through the provision of generous healthcare benefits

disappeared.[34] In addition, new employers did not replace these old companies. Thus, there were no large employers to exercise control over hospital activities in the devastated cities, but more importantly, the financial burden of uncompensated care increased dramatically with the loss of these employers. In Toledo, the nine area hospitals dispensed, on average, $40 million dollars in care to patients that could not pay for services from 1982 to 1990 ("Hospitals' Unpaid Care Costs Climb" 1990). While a comparable number was not available for Flint area hospitals, "the medical indigent" were cited as a pressing problem (Engeling 1992). In both cities, the higher than average unemployment rates due to factory shutdowns and the growth of low-end service jobs that do not offer healthcare benefits were recognized as factors contributing to the increase in uncompensated care. As a result, the hospitals in these cities have failed to operate in the black ("Hospitals' Unpaid Care Costs Climb"1990; Interview 1/31/07b, 1/31/07c).

Oddly, financial crisis would seem to be incentive to cut costs and reduce employment in professional services in devastated cities. Instead, the opposite happened. Hospitals in Toledo and Flint expanded their operations at a rate much greater than the stable cities. Why the expansion projects have been so large in these cities appears to be driven in part by the employer shifts discussed above but also by demographic shifts. The loss of major employers created medically disadvantaged populations within the

[34] In Flint, GM remains the largest employer but I could not find evidence it monitors healthcare costs in the same way as other employers in the stable cities. For example, it does not fund studies on the healthcare needs of the Flint community. In addition, as GM started to withdraw production from Flint, the corporate elite that once resided in the city also left, leaving a void in corporate leadership on hospital boards and in the community in general (Interview 1/31/07).

devastated cities. Adding to this problem, many people moved out of these economically deteriorating cities. The devastated cites experienced dramatic population losses from 1970 to 2000 (U.S. Census 1970, 2000). As a result, hospitals had to look outside of the city for affluent patients. Revamping existing services was not an option that lured these patients into the struggling cities. Therefore, the hospitals in Toledo and Flint took on massive expansion plans outside of the city to lure patients from neighboring communities and cities that would have gone elsewhere for their medical needs.

Similar to Akron General Hospital, the hospitals in Toledo expanded by building new outpatient facilities that were strategically located near growth regions outside of the city. The outpatient facilities not only provided traditional care, such as surgeries, testing procedures and rehabilitation services, but the hospitals also branched out into newer services, including instruction on communication skills in high stress situations, nutrition and diet services, exercise consulting services and recreation facilities ("Area Hospitals Expanding Health Care Services" 1987; Deleone 1992). In Toledo these facilities clustered in the Western and Southern parts of the metropolitan statistical area. This is where the more affluent suburbs were growing, especially in the South.

Importantly, Toledo's hospital expansion was not small in scale. The addition of outpatient and ambulatory care centers suggests small establishments that would not have a dramatic effect on levels of employment in the professional services. However, from the late 1980s through the mid-1990s, construction of these facilities was constant. This produced clusters of outpatient care centers that covered acres of land in the parts of the

city that bordered on the wealthier growth areas. These sprawling clusters of services are larger in area than the hospitals themselves (Interview 2/06/07).

Flint hospitals followed the same strategy. There were four downtown hospitals in the city and all started to expand into the suburbs by creating new outpatient and ambulatory care facilities. Hurley hospital was particularly active in expanding through the development of smaller care centers (“”Hurley to Purchase Nursing Home” 1993; “Hurley Plans to Buy Pediatric Office to Boost its Presence” 1992; “Hurley Fitness Center Opens (Belatedly) at Great Lakes Centre” 1991; “”Hospitals Expanding Services to Attract Elderly” 1987; “Hurley May Build Major Recreation Center” 1986). The hospital continually reported expansion plans even after posting multi-million dollar operating deficits (“Hurley Reports Growth With Specialty Services” 1992; Krueger 1988). Similar to Toledo, the expansion created clusters of care providers in certain parts of the city. Most of this expansion was concentrated in the western and southern parts of the metropolitan statistical areas near growing affluent suburbs (The National Economic Development and Law Center 2001).

In 1990, McLaren hospital in downtown Flint announced it would undergo a $54 million dollar expansion, but this was the only, and the last, expansion in the central city (Miller 1990). Three years later the other downtown hospitals in Flint would shutdown the majority of their operations in the city and relocate to the southern part of the metropolitan statistical area in a new 500 acre medical campus (Stobbe 1992). This was a strategic plan on the part of hospital CEOs to lure patients from the affluent suburbs north of Detroit and Ann Arbor. The new medical campus, Genesys, would be a regional

care facility. Essentially, with this move, most of the hospitals in Flint were abandoning the city. McLaren stayed in the city, but this would change after 2000. Currently, McLaren follows a regional strategy as well. The hospital recently announced a $500 million dollar plan to relocate outside of Flint in Oakland County—a part of the growing and affluent north Detroit suburbs. Thus, in the southern part of the Flint metropolitan statistical area a medical service corridor has developed, which has increased employment in the professional services.

The development of the southern Flint medical service corridor was an intentional strategy on the part of hospital CEOs, but now, city leaders also recognize it as one of the few resources the city can exploit to find a niche in the global economy. Local politicians and economic leaders believe Flint's trajectory in the global economy relies on further building up the hospital industry (Interview 1/31/07a). At Genesys, a conference center and athletic center has been added and retail businesses and hotels have been proposed (Kirkendoll 2007). The goal is for Flint to become the regional hub for health services, but really, this is not happening in the city of Flint. The development is happening at the southern edge of the city and outside of its metropolitan statistical area. Essentially, the geography of Flint appears to be changing where the central city matters less than it did before.

Toledo is similar to Flint although it has not developed large medical campuses. The development of the healthcare service clusters were not intentional economic strategies, but rather, hospital survival strategies, but they are now being viewed by local political and economic leaders as a possible economic role the city can occupy. Toledo

prides itself on offering comprehensive medical services. In fact, a member of the regional development organization compared the city's growing southern cluster of medical services to the Mayo Clinic. The goal of city planners is for the clusters of services to increasingly expand and act as a magnet to draw patients into the city (Interview 2/05/07). Thus, both of the devastated cities are relying on professional service employment, hospitals and medical services, to adapt to the global economy.

In sum, hospitals are expanding in all of the cases. The differences in the expansions are in scale. Devastated cities have carried out much larger expansion projects. The growth of the hospitals started as a survival tactic. The hospitals followed the movement of the patients. Yet, in time, local political and economic leaders came to view the build up of the health services industry a potential economic resource. Further expansion is encouraged in the devastated cities as part of regional economic strategies. This has produced a sprawling geography of hospital and health services in the devastated cities that does not exist in the stable cities.

Conclusion

In this chapter I focused on changes in the service sector. In particular, I explored two earlier findings in depth at the case level. First, earlier analyses showed employment growth in the business services separated stable cities from devastated cities. There are two arguments for how these services develop. Some argue they arise to service corporate headquarters while others assert a healthy manufacturing sector is necessary for their development, as manufacturers are the primary consumers of these services. With the data I gathered on the growth of business services in my case studies, I could not

adequately assess the first position. However, it appears corporate headquarters satisfy their business services needs differently in the stable and devastated cases. The large corporations headquartered in Grand Rapids seem more committed to carrying out business services in-house. On the other hand, the large corporations in Toledo outsourced their service needs to large, non-local service providers. This difference needs to be explored further, but it hints at a larger issue that was also apparent in manufacturing. Some companies show a larger commitment to place than others. Given the data I have gathered for this dissertation, I cannot answer why this is the case but it is an issue I will return to in my concluding chapter.

There was strong evidence supporting the second argument. A healthy manufacturing sector drives employment growth in the business services. In the stable cases, this employment was concentrated in computer-related services. Manufacturers needed to upgrade their technologies to remain competitive and branch into new growth industries. In particular, manufacturers started to implement new design and development software and organizational management software. The provision of these computer-related services could have been imported, but starting in the mid-1980s, software development companies started to develop in stable cities. Some started as spin-offs of IBM business partners and some developed as traditional start-ups. These companies located in these cities to be part of the changing manufacturing environment. According to computer-service business owners in Grand Rapids and Akron, being a part of something new and growing is the most thrilling part of the business. Thus, where manufacturers are changing, business services are likely to develop. In the devastated

cities, where manufacturers were still deeply integrated into old types of manufacturing or dying off, business services growth was stagnant and even non-existent in the case of Flint.

Second, earlier analyses indicated employment growth in professional services separated devastated cities from stable cities. This employment is concentrated in the hospital industry. A complete exploration of hospital industry dynamics is beyond the scope of this dissertation and begs for further research. In this chapter I have simply highlighted several possible reasons for why hospital employment growth is greater in devastated cities than in stable cities. First, in the stable cases, large employers kept pressure on hospitals to keep healthcare costs down. They did this indirectly by funding studies on the healthcare needs of the community and by publicly critiquing hospital expansion plans. Large employers also directly influenced hospital activities by having company leaders serve on hospital boards. In the devastated cities, expansion went unchecked. Second, in devastated cities uncompensated care was a significant problem. Hospitals in Flint and Toledo continually operated with budget deficits and frequently cited the medically indigent as a growing concern. This sparked hospital expansion into more affluent communities. Finally, devastated cities were devastated population, which further eroded their patient base and intensified expansion into wealthier, outlying suburbs. Sprawling clusters of healthcare services and even new, massive hospital campuses formed outside of devastated cities. Currently, political and economic leaders in Flint and Toledo view this expansion as an economic resource and are marketing their cities as regional healthcare service providers.

How healthcare industries have changed over time is beyond the scope of this dissertation, but the findings from this chapter point to where future research should be directed. First, the causes I have outlined to explain different rates of expansion should be more thoroughly examined. Second, the quality of the jobs created by hospital industry growth is a concern. Third, the new geography of the industry raises questions about access to care, especially for those who still reside in the deteriorating inner cities. Fourth, whether or not the massive healthcare systems being built can be sustained deserve attention. Finally, even in the expansion of healthcare systems the stable cities had large employers that were active in their local communities. In an era of globalization when place should not matter, there are still companies that are involved in their local communities. I will speculate on why this might be the case in my concluding chapter.

CHAPTER 7: CONCLUSION

Global economic restructuring has transformed the economic landscape in America, as traditional industries have deteriorated in old cities in the Midwest and Northeast regions of the country and new industries have developed in growing cities in different regions. This process has lent support to theories in the social sciences on urban growth and decay that argue changes in the economy register themselves in new places at the expense of traditional sites of economic activity. I have questioned the assumption of uneven development by describing variation in the way cities in the Rust Belt have reorganized their local economies to find a new economic niche in the era of global capitalism.

By highlighting these different economic experiences, I do not mean to suggest the deterioration of the Rust Belt has not happened. Deindustrialization has been, and continues to be, a disruptive force in this region. Rather, I point out that economic transformation can happen within older cities. This is a controversial position; for example, Kassarda (1988: 79), a leading theorist of urban growth, describes efforts by cities to counteract current economic forces "as unrealistic as they are nostalgic." His comment reflects a hole in scholarly thinking on how broad economic trends shape the urban environment. This research addresses this hole by accounting for the reality of cities' built environments. Below, I review significant findings from this project and detail how they contribute to existing scholarly work on economic restructuring and theories of urban growth. I then discuss limitations of the research, and suggest necessary directions for future research.

Review of the Findings

In Chapter 2, I focus on identifying the different types of cities in the Rust Belt and on determining how the quality of life has changed in these cities over the course of economic restructuring. The focus on types of cities responds to existing research on deindustrialization that describes economic restructuring in the region primarily through the experiences of a certain kind of city—the medium-sized city that has had a long history of manufacturing in metals-based industries (see Crandall 1993; Bluestone and Harrison 1982). These cities were very vulnerable to deindustrialization and accounts of their economic restructuring experiences are the basis for blanket descriptions of the region as a whole, which center on socio-economic collapse.

In Chapter 2 I show there are seven different types of Rust Belt cities, but most cities are of three specific types: the medium-sized city with a strong history of manufacturing in vulnerable metals-based industries, the smaller city with a strong history of manufacturing in vulnerable metals-based industries, and the smaller city with a history of manufacturing in less vulnerable industries. I also show there is variation in how the quality of life has changed in Rust Belt cities during the period of global economic restructuring from 1970 to 2000. Out of the 69 cities for which consistent, longitudinal data were available, 24 of them are "stable" cities that did not follow typical stories of socio-economic decline. Rather, they performed better on a variety of socio-economic indicators over the course of economic restructuring than all metropolitan statistical areas in the U.S. on average. There are 26 cities that declined on a few of these indicators and appear to be "struggling" cities. Finally, there are 19 "devastated" cities

that have experienced total socio-economic collapse over the course of economic restructuring.

I then combine city type with the quality of life assessments. I show there are 7 stable, 3 struggling, and 5 devastated medium-sized cities with a strong manufacturing history in the vulnerable metals. There are 12 stable, 11 struggling, and 9 devastated smaller cities with a strong manufacturing history in the vulnerable metals. Finally, there are 3 stable, 6 struggling, and 4 devastated smaller cities with strong manufacturing histories in non-vulnerable industries. This portrait of the urban Rust Belt complicates descriptions of deindustrialization. Not all cities in the region have collapsed. In fact, even some of the most vulnerable cities have resisted the negative effects associated with the wave of deindustrialization that spread through the region from 1970 to 2000. Through this simple classification of cities I show that descriptions of how cities in this region have been negatively transformed by deindustrialization are incomplete and there is more variation in outcomes than currently accounted for.

In Chapter 3 I begin to address theoretical concerns about the growth of cities, mainly I begin to question the assumption of uneven development. City performance (stable, struggling, and devastated) should be directly related to destruction of the old economy—losses in manufacturing employment. However, I show the employment trends that characterize the stable cities are a decrease in manufacturing employment accompanied by an increase in employment in business and repair services. The employment trends that characterize devastated cities include a decrease in manufacturing employment and an increase in employment in professional services.

Finally, struggling cities have also lost employment in manufacturing, but gained employment in both business and repair services and professional services. Thus, all of the cities have experienced losses in manufacturing employment and have reorganized their economies. However, the experiences of struggling and devastated cities, economic adjustment with a decline in quality of life, are more consistent with current theoretical understandings of urban growth. According to these understandings, the experience of the stable cities, economic transformation without decline, should not happen.

In Chapter 4 I utilize an innovative methodological strategy to clarify the new economic roles cities in the Rust Belt region occupy. I am specifically interested in whether or not any of the Rust Belt cities have taken economic trajectories associated with new growth areas (i.e., tourism or high-tech production routes). The findings from this chapter again address the theoretical notion of uneven development. They also speak to the literature that describes the structure of the global economy. The results show there is a great deal of complexity in the routes the different Rust Belt cities have taken. However, there are several clear patterns. First, stable, medium-sized cities with a history of manufacturing in the vulnerable metals display a combination of employment trends that suggest they have developed producer service-based economies. This is an important finding that demonstrates local economic reorganization is not only possible, but Rust Belt cities can occupy niches reserved for new cities. Second, manufacturing employment is more important to smaller cities than the medium-sized cities. For the most part, smaller, stable cities with histories in both the metals-based and non-vulnerable industries have retained manufacturing employment. Conversely, these types

of devastated cities have experienced dramatic losses in manufacturing. This finding suggests smaller cities conform better to theories of urban growth than the larger cities that have adopted new economic roles. Current theories of urban growth recognize the diffusion of manufacturing from large to medium-sized to smaller cities and suburbs, but they still do not account for the economic reorganization shown in the medium-sized, stable cities. Finally, similar to the results from Chapter 3, all devastated cities show greater growth in professional services employment. The industry that drives employment growth in this sector is hospitals. Thus, devastated cities are developing healthcare-based economies. This further contributes to descriptions of economic restructuring by identifying the new economic roles devastated cities are occupying rather than leaving them as ghost towns that have collapsed after manufacturing loss.

In Chapters 5 and 6 I explore the findings from previous chapters in greater detail by examining specific stable and devastated cases. The stable cases were Grand Rapids, Michigan, and Akron, Ohio. The devastated cases were Flint, Michigan, and Toledo, Ohio. The goal of the case studies was to highlight specific instances of economic adjustment.

In Chapter 5 I focus on changes in manufacturing. The results show all of the cities lost a considerable amount of manufacturing employment, but there are significant differences in the manufacturing that remains in these cities. In the devastated cities manufacturing employment remains concentrated in old industries, especially automobile production, and in old, mass-production factories. Essentially, Flint and Toledo are desperately holding onto remnants of their old economy. The stable cities have creatively

transformed their manufacturing and have made strides toward becoming post-industrial production sites. Much of their manufacturing employment is concentrated in small, specialty manufacturers that were given new work by large companies active in new product development. In the stable cities, large employers that were well positioned to take advantage of new growth industries in the service-based global economy, such as office furniture makers, or employers that located their research and development facilities locally, were resources for creative transformation. They kept innovation processes alive in the stable cities even after production left, allowing manufacturing in these cities to change the type of manufacturing they perform from the vulnerable metals to plastics to biomedical products. These results again show sites of traditional economic roles have been able to transform themselves and even occupy economic niches associated with growing cities in new regions. They also show how the organization of industries within a city plays an important role in facilitating adjustment. This is a finding that is discussed in greater detail later.

In Chapter 6 I analyze how employment in business services and professional services changed in the stable and devastated cases. In the stable cases, employment growth in the business services was concentrated in computer service companies. These companies developed as manufacturers began to update their technologies. In the devastated cities, where there were declining old manufacturing economies, these computer service providers did not develop.

Manufacturing also determined the growth of professional services. In devastated cities, where the effects of deindustrialization were more apparent, the employment in the

hospital industry grew rapidly. As cities declined, hospitals expanded elsewhere to find new patients. These expansion efforts were massive and increased employment in the professional services. In stable cities, the effects of deindustrialization, such as population loss and poverty, were not as pressing. Hospitals did not need to engage in massive expansion plans to find new patients to ensure their survival. Additionally, the major employers in the stable cities exerted pressure on the local hospitals to keep healthcare costs low. This contained unnecessary hospital expansion.

Cumulatively, the findings from the cases detail processes of change that are not permitted in current theories of urban growth. They also detail new economic roles different types of cities occupy in the new economy. This adds to descriptions of the structure of the global economy not just by acknowledging economic roles that have been recognized elsewhere also exist in the Rust Belt, but also by describing new economic roles developing in struggling cities.

At this point, the contributions of this research should be clear. On a theoretical level, I focus on scrutinizing the notion of uneven development that dominates understandings of urban growth. I show that economic and urban transformation can occur within old regions. On a descriptive level, I detail these transformations, and I use innovative methods to do so. Importantly, in this description not only am I interested in economic roles of cities that have been identified elsewhere, such as flexible specialization and producer services, but I am also interested in the development of new economic roles that have not received as much scholarly attention, such as health-care based economies or low-end service economies. Identifying what these local economies

might look like through general employment trends and where they exist, I provide the most comprehensive description of the urban Rust Belt after global economic restructuring. This serves as a foundation for exploring why certain types of economies develop where they do.

Limitations and Suggestion for Further Research

There are several limitations to this research that are worth noting. First, throughout this project I have been interested in identifying specific types of local economies. Initially, I also wanted to identify specific moments during the economic restructuring process that could be recognized as turning points, or local economic reorganization points, within cities. Unfortunately, the quality of the data available was not optimal for meeting either objective for all cities in the region. I tracked employment trends because these were the only consistent, longitudinal data available that could reveal changes between different types of economies. Using these data, it is still difficult to identify specific types of local economies with complete certainty, as evident in Chapter 4. Supplementing employment data with information on major employers could improve assessments of types of economies, but as shown in the case studies, small employers play a major role in local economies. These are the businesses that are excluded from major employer lists available on metropolitan statistical areas. Employer directories are another way to supplement employment data, but these are usually only available for manufacturers. Thus, the best methodological strategy for assessing types of local economies is a case approach. I do this for four cities but to develop the type of regional description I initially intended through the analysis of cases is unfeasible.

Hopefully, current economic census data that is arranged by the North American Industrial Classification System (NAICS) does not experience as many reclassifications as older census data. If not, types of economies can be identified with industry-level data with complete confidence in cities from 2000 onward. Identifying changes in types of local economies that have happened in the past however, will continue to be a challenge best met by case approaches and a triangulation of methods. Otherwise, there is a degree of uncertainty that enters assessments of types of local economies.

Second, an interesting finding of this research is that hospital expansion took very different forms in stable and devastated cities. I connected these different forms to the impacts of deindustrialization, but the causes of hospital expansion in stable and devastated cities require further attention. Unfortunately, I was unable to explore this finding as thoroughly as I had wanted. I focused primarily on the development of new private businesses within cities at the expense of a more thorough examination of healthcare facilities. Additionally, a deeper analysis into the changing form of healthcare industries is beyond the scope of this project. However, this is an extremely important topic, especially because it has definite effects on the quality of services provided and also for what appear to be emerging inequalities in access to services in devastated cities. Interestingly, in my case studies, it appears the development of hospitals systems in devastated cities are being recognized by local political elites as the foundation for a new type of local economy. This is definitely true for Flint, as new retail and service facilities are being built near major hospital complexes. Healthcare economies are not recognized

in the literature on economic restructuring as a viable economic role for cities in the global economy. How and why they develop demands greater attention.

Third, another interesting finding that emerged from the analysis of cases was the degree of integration between large manufacturers, small manufacturers, research and development facilities and corporate headquarters in the stable cities. In the stable cities, these connections are vital for local economic transformations. This is evident in the descriptions of how Grand Rapids and Akron are developing agglomeration economies that combine the manufacturing of basic products for the medical industry, the manufacturing of high-tech products, scientific research, and the delivery of healthcare services. In the devastated cities, the integration between these different business establishments was nonexistent. In fact, in Flint, General Motors impeded its development. Unfortunately, in this research I was unable to describe the connections between these different organizations with the amount of detail I wanted. For instance, the connections between R&D facilities and small, specialty manufacturers are thinly developed, as are connections between large manufacturers and small manufacturers. As a result, I feel the descriptions of the local economies are not as thorough as they could be. I believe further research into the structure of the networks between these different organizations would provide a more thorough, and ultimately more useful, description of the local economies. In fact, further research of this type would likely engender explanations for why some cities have been able to reorganize their local economies while others have failed.

Absence of a theoretical explanation for why cities take different economic trajectories is the clear limitation of this research, but although the findings were descriptive, they do allow for an assessment of some of the theoretical perspectives on urban growth reviewed in Chapter 1. They also point to where further research into explanations may be fruitful.

In Chapter 1, I draw from research on the structure of the global economy to suggest some resources that may explain why cities take different economic trajectories. For instance, the presence of corporate headquarters (Friedland and Palmer 1984), universities (Saxenian 1994; Logan and Molotch 1987), transportation networks (Hawley 1981), and large employers (Young, Francis and Young 1994) are all recognized as vital resources for the development of certain new economic roles. Overall, the findings from this research suggest that not one of these resources on their own explains whether a city is stable, struggling or devastated.

The experience of Toledo demonstrates that corporate headquarters do not necessarily help a city adapt to the global economy. Toledo once had seven Fortune 500 headquarters and they now have three. Still they remain a devastated city that continues to have a local economy based on the production of automobiles. The presence of universities also does not explain city performance. While the University of Akron played a role in the development of the polymer industry in Akron, the cities of Syracuse, South Bend, Champaign-Urbana, and New Haven all have major universities but they are struggling or devastated cities. In regards to transportation networks, all of these cities are on major highways but there are certainly differences in local airport capacity.

However, travelers to any of these cities are likely to utilize the major airports in the largest cities. Therefore, it is unlikely transportation networks offer strategic advantages to any of these cities, but this is not certain. Finally, major employers (large factories) do not necessarily explain differences between cities. Steelcase certainly played a role in the transformation of Grand Rapids, but Jeep, Ford, O-I and O-C do little for Toledo. The most interesting contrast here is between Steelcase and O-I. Both companies are experiencing growing demand for their products, but only Steelcase expands locally while O-I directs its investments extra-locally.

The case studies do show that these resources become motors for economic development when they are linked together as described earlier. The degree of integration between corporate headquarters, universities, and different types of employers was obvious in Akron and Grand Rapids. Interestingly, Grand Rapids does not have a major university but its smaller universities still worked closely with private companies, mainly small manufacturers. How the connections are made between these potential resources is a likely better explanation for why cities take different economic trajectories. The answer most likely lies in local politics.

From the information I gathered on my cases, urban regime theory appears to be the most useful perspective for answering why some cities adapt to the global economy while others collapse. The feature of urban regime theory that makes it attractive is how it connects governing coalitions to competing groups (see Stone and Sanders 1987; Fainstein and Fainstein 1983). The growth machine perspective (Logan and Molotch 1987) just assumes that the growth machine is the dominant political coalition and it says

little about how local states operate. By recognizing different governing coalitions, urban regime theory parallels Evans (1995) "neo-Weberian" approach to understanding why state involvement in the economy works in some developing countries but fails in others. The key difference between these two perspectives, besides level of analysis, is urban regime theorists focus on the nature of politics and interests in governing coalitions, while Evans focuses on state structure, mainly how closely states conform to the ideal type bureaucracy. In my case studies, it appeared these two features appear to combine in the local states of stable cities but with the data I collected I could better assess local state structure. The only determination I could make on the nature of politics was whether or not they were cooperative or combative. These differences are described below.

In the devastated cities, economic planning functions and decision-making power were dispersed across multiple governmental organizations. In Flint, the Metro Chamber of Commerce, the economic development arm of the city government, the county-level development organization, and the focus council (a roundtable of appointed economic elites) all shared economic planning responsibilities. In addition to these organizations, Michigan has township governments. These small governmental units often had an input in city planning efforts in Flint (Interview 1/16/07). Toledo had a similarly large array of organizations involved in economic planning. The Toledo Department of Development, the Toledo Port Authority, the Toledo Chamber of Commerce and the Lucas County Improvement Corporation formulated economic development plans for the city.

In both devastated cities, relations between these governmental organizations were combative. In Flint, tensions between these organizations were visible in planning efforts to expand the airport and in the development of Autoworld, a theme park based on the history of the automobile (Interview 1/13/07). In Toledo, competition between these organizations was apparent in debates on how to develop the waterfront, plans to build a new state penitentiary, and in the development of incentive packages to keep Chrysler's Jeep facility in Toledo (Interview 2/05/07; Pakulski 1998). The competition between these organizations slowed planning and response to local economic problems. In combination with these feuding organizations, the mayor's office in devastated cities was unstable.

Both Flint and Toledo are strong mayor systems. In Flint, there was no mayoral leadership over the period of economic restructuring. The city went through a mayoral recall in the early 1980s. An inexperienced, young, white candidate won the recall election and replaced Flint's first black mayor. This election sparked racial tensions in the city that crippled the local government. The new mayor only served only one term in a city government divided by racial and political allegiances. By the end of the new mayor's short tenure the city was under state receivership. This of course, would be a significant problem for the next mayor, who would also serve one term.

The mayor's office was not as unstable in Toledo, but there was consistent turnover over the course of economic restructuring. Only one mayor served two terms during this time period. Toledo also had an important private organization that is worth mentioning, as it may have served as an additional obstacle to economic development. The organization

was called The Committee of 100. It was a voluntary organization created by local business leaders in the mid-1980s to address Toledo's economic problems and help formulate responses to industrial crisis. The Committee of 100 dissolved into splinter groups, as plans to build a downtown baseball stadium and to develop the waterfront became hotly debated within the organization. The splinter groups, like the governmental organizations in planning, were fiercely competitive (Interview 2/06/07). It is unclear as to whether or not local state actors were isolated from this competition, but it is unlikely. Several splinter groups from the Committee eventually formed the Toledo Regional Growth Partnership. This group works with the Lucas County Improvement Corporation but has no connection to the Toledo Department of Development, the Toledo Chamber of Commerce, or the Toledo Port Authority.

In comparison, the stable cities of Grand Rapids and Akron had similar local state structures. For the most part, economic planning was conducted by a regional and a city-level organization. In Akron, the Greater Akron Regional Chamber of Commerce collaborated with the Department of Economic Development at the mayor's office. In Grand Rapids, the Right Place collaborated with the City Planning Division of the mayor's office. The only difference between these cities is the Right Place, Grand Rapids' regional planning organization, is a public/private organization. It was created by the mayor's office in 1984, but it is required to raise private money to fund its own operations. Additionally, the Right Place acts as a mediator between the city and Michigan townships. In both of these cities, while planning is split between the regional and the city units, decision-making power rests in the city organizations. Thus, not only

are there less organizations in the planning process in the stable cities, but power is concentrated in one decision-making body.

The concentration of power and the lean structure of the organizations in charge of planning may be why conflict is not an issue in the stable cities. There were no reports of conflict on developmental issues in Akron or Grand Rapids, but this requires further examination. If collaboration does exist as suspected another contributing factor may be the continuity of leadership in these two cities. Akron has had the same mayor for over 20 years. Grand Rapids does not have a strong mayor system, but it has had the same city manager since the early 1980s. Thus, both cities combine continuity of leadership with a lean structure of planning organizations.

While there are clear differences between the local states in stable and devastated cities, there were also apparent differences in their connections to local capital. Urban regime theory, again serves as the optimal perspective for understanding this connection. In the growth machine perspective, this connection is interpreted as the state's subservience to capital. In urban regime theory, Stone (1989) shows a positive governance coalition connected to corporate leaders can produce "positive" politics, whereby economic elites work with the local state in a cooperative fashion and expend their resources on local projects serve the communities best interest. Again, urban regime theory parallels the work of Evans, who argues autonomous states need to be "embedded" in networks to industrial capital. This gives states access to information and resources that are necessary for successful economic planning and implementation.

In my research on the case studies, I did not gather adequate data on the relationship between state actors and economic elites. However, there are clear differences in the degree of commitment the major employers in the stable and devastated cities have to their communities. This commitment was expressed in different ways. In Grand Rapids and Akron it was visible in decisions to keep and expand production facilities, to keep research and development facilities and to keep corporate headquarters local. Additionally, there was a marked difference in philanthropic activities in Grand Rapids and Akron. In Grand Rapids, economic elites were responsible for the creation of specialized hospital care centers, museums, the downtown arena, and the new cancer research center. In Akron, Goodyear funded the development of the polymer research center at the University of Akron and certain downtown revitalization projects. Local government officials in these cities were quick to point to a strong private sector as one of the keys to successful planning and to the resolution of economic problems (Interview 1/10/07a; Interview 1/11/07; Interview 1/29/07).

In Flint, General Motors was not known for investing in the community. Additionally, the C.S. Mott Foundation, a grant giving institution that funds business and social research, had an extra-local focus. Toledo had a strong corporate presence, as the headquarters city for Libbey-Owens-Ford (LOF), Owens-Illinois (O-I), and Owens-Corning (O-C). LOF's presence in the community vanished when it was bought out by Pilkington Group, but O-I and O-C remain in Toledo. As described earlier, these companies disinvested in the city, moving production and research and development outside of the city. Also, there is no record in the newspapers of philanthropic activity on

the part of major business leaders from these companies. In fact, Toledo has operated under the motto, "What's good for the Owens companies is good for Toledo" (2/7/07a, date).

From the case studies it is clear that urban regime theorists offer the strongest perspective for explaining why Rust Belt cities take divergent paths. This perspective can be strengthened by insights from Evans, who shows the structure of the local state is also an important factor that can shape economic development outcomes. In fact, Evans would argue that the structure of the state influences the nature of politics and political interests. For him, the bureaucratic state is necessary because meritocracy keeps bureaucrats from pursuing their self-interests and prevents clientelism. However, while both urban regime theory and Evans offer explanations for why the state may function more efficiently and be better equipped to promote growth. They do not adequately explain why business elites vary in their commitment to the community. The growth machine perspective suggest it is the less mobile economic elites that have the greatest attachment to place, but the active economic leaders in Grand Rapids and Akron are major corporations that have no reason to be attached to their cities in an era when capital flight is the norm and not the exception.

Returning to the literature review in Chapter 1, Ratcliff's (1980) research may be the most useful for understanding the commitment of business leaders to place, or at least, for pointing out directions for future research. He showed that the relationships local banks formed with different local and extra-local businesses largely determined their patterns of investment in their communities. Ratcliff showed that when banks

formed coalitions with national corporations that were not local, they tended not to finance local mortgages and actually supported business plans to disinvest in the community. These findings are somewhat similar to the degree of integration between different business establishments, which was discussed earlier. It is clear that the major businesses in the stable cities are more deeply integrated into their local area. Corporate decision-making, research, and production are all done locally. Furthermore, supplier networks and relationships to business services providers are also local. It is feasible this degree of integration between different business establishments in one place makes it difficult for any one of them to free themselves and abandon the area. Still, the formation and the preservation of these relationships do not happen naturally. Organizational culture may also be an important factor in determining business commitment to place (see Galaskiewicz 1985). Further research is needed in this area but a networks-based approach seems to be the most promising for developing an understanding of business leaders maintain attachments to their cities.

Final Remarks

David Harvey (1985b: 158) writes, "the successful urban region is one that evolves the right mix of life-styles and cultural, social, and political forms to fit with the dynamics of capital accumulation…urban regions wracked by class struggle or ruled by class alliances that take paths antagonistic to accumulation…at some point have to face the realities of competition for jobs, money, investments, services, and so forth." For Harvey, and other theorists of urban growth, the "successful urban region" is not forming in today's Rust Belt. Rather, the cities in this region are suffering due to the "realities of

competition." This is the notion of uneven development that is firmly embedded in theories of urban growth. Cities in distressed regions characterized by traditional industries deteriorate as new cities take form around new industries in regions far removed from the traditional centers of economic activity.

In this dissertation I have contested this belief by describing the economic transformations that have occurred in the U.S. Rust Belt over the course of economic restructuring from 1970 to 2000. I did not question whether or not the Rust Belt has suffered deindustrialization. This is a certainty. Rather, I showed that within this distressed region that has become almost wholly known for industrial decline, economic transformations can and are happening that suggest it is entirely possible for the successful city to develop within older regions. I provided descriptions of these transformations, producing a comprehensive portrait of the economic geography of the urban Rust Belt. In this description I not only included the instances of successful reorganization, but I also detailed what employment looks like in cities devastated by deindustrialization.

The portrait of the urban Rust Belt in this dissertation should serve as the foundation for the development of new theoretical insights into urban growth processes. I have highlighted what I believe to be the most promising areas for further research based on insights I have drawn from assembling this project. My hope is that future research into these areas will not be viewed as exercises in nostalgia but serious inquiries into important processes of urban adaptation. It is only through a thorough understanding of how cities can adapt that the negative impacts of economic restructuring that continue

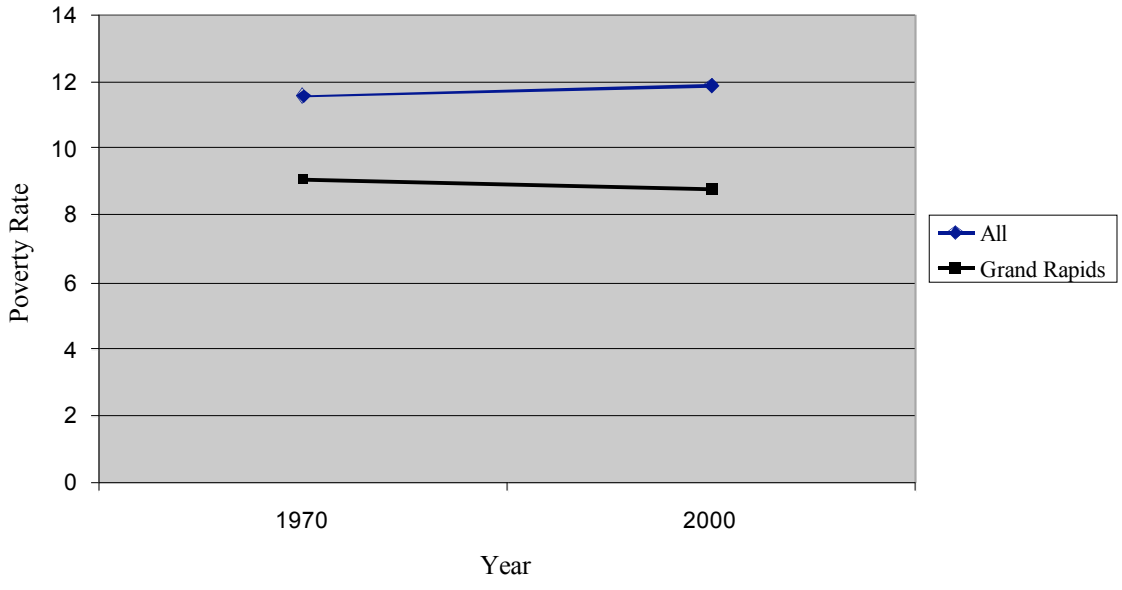
to plague some urban areas can be alleviated. Furthermore, only through such an understanding can a repetition of the past period of deindustrialization be avoided in different regions in the future. After all, while uneven development may not be inevitable, in all likelihood, a future period of economic restructuring is.

APPENDIX A: CASE SELECTION

To select the cases, I examined a *Rand McNally Road Atlas* from 2000 and listed all of the larger cities within each state of interest. I then examined Census data available through the Department of Housing and Urban Development's State of the Cities Data System to determine which cities had a MSA population greater than 100,000 people in 1970. Those that did not meet this inclusion criterion were excluded. As mentioned in Chapter 2, three cities that met this criterion were excluded. These include: Bridgeport, Connecticut; Gary, Indiana; and Lowell, Massachusetts. The reason Bridgeport was excluded is because its close proximity to New York had inflated its performance on the quality of life index. On several different socio-economic indicators, especially change in per capita income, Bridgeport's performance far exceeded that of any other city in the region. Lowell and Gary are also satellite cities but this is not why they were excluded. Consistent, longitudinal data were not available for these cities. I could not assess Gary's integration into the vulnerable metals in 1970 or its performance on several of the socio-economic indicators that were included in the quality of life index. Data on Lowell were missing for some of the quality of life indicators. This is why these three cities were excluded. Bridgeport however, raises an important issue concerning satellite cities. Allentown and Akron are the only cases in the study that are within sixty miles of a major metropolitan area. They were not excluded because it is believed their quality of life and economic performance are not influenced by the larger cities they are near. This is not certain with Allentown, but my case research confirms that the growth, collapse, and growth of Akron is largely disconnected from economic changes in Cleveland.

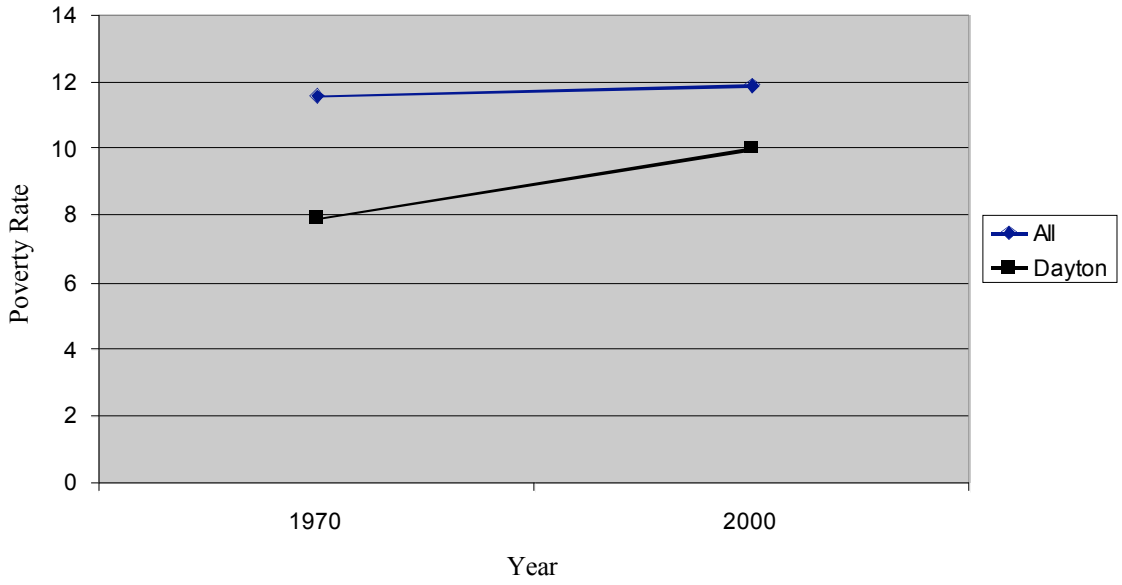
APPENDIX B: QUALITY OF LIFE INDEX

As mentioned in Chapter 2, natural breaks in the total change scores served as preliminary indicators for cut-off points between the stable, struggling and devastated performance categories. This is explained in the text and can be assessed by ranking cities by their "total score" in Table 2.5 in Chapter 2. From this initial classification, graphs were then made of each city's performance on each socio-economic indicator in the quality of life index. In the graphs, each city was compared to all metropolitan statistical areas in the United States on average. For example, the graph below compares how the poverty rate in Grand Rapids changed to all MSAs on average. This was classified as a "stable" outcome. Other stable cities had to demonstrate a change trend similar to Grand Rapids to be considered a stable performer.

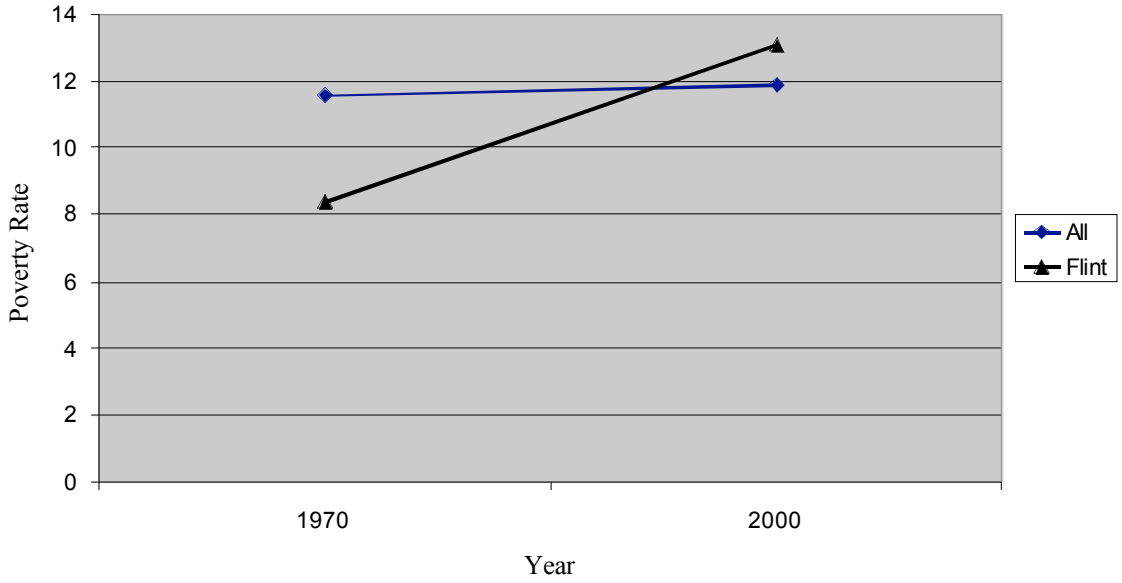


The graph below demonstrates struggling performance. The poverty rate in Dayton increased from a low starting point. Thus, Dayton started to slide from good standing.

Dayton is still doing better than all MSAs on average, but its change trend shows it has slipped considerably while all MSAs on average have remained somewhat stable. Thus, cities that demonstrated trends similar to Dayton were considered struggling performers.



Finally, the graph below exemplifies devastated performance. Flint's poverty rate increased dramatically from 1970 to 2000 from a very low starting point. Its end point is worse than all MSAs on average. From this change trend it is clear that Flint is a devastated performer.



The classification of these three cities on poverty rate is a drastic simplification of the sorting process that was followed. There are 69 total cities, so 69 graphs were compared for seven different indicators for a total of 483 graphs. Each stable city had to have a similar starting point in 1970, a similar change trend from 1970 to 2000, and a similar end point in 2000 on each socio-economic indicator in the quality of life index. This is the same for struggling and devastated cities.

Of course, this would not always be the case. Some cities demonstrated trends that were unique. For these cases, it was determined if a city's change was negative or positive. For example, a city could have had a higher than average starting point but decreased its poverty rate to finish at a similar end point as Dayton. This is a trend that is much different than Grand Rapids, but it is not necessarily a struggling or devastated trend. In such cases, the city's change rank would be adjusted. If only change scores were examined, this hypothetical city would likely be ranked in a tie with Grand Rapids,

although its change is much different. By examining the actual trend, its rank would be adjusted so it was in between the stable and struggling cities.

This process of comparing graphs and taking extensive notes on starting points, change trends, and end points was used to edit the rankings that were based only on change scores as shown in Table 2.5 in Chapter 2. While this was a tedious process, it ensured a more valid determination of performance on the quality of life index than if only change scores were used. Stable, struggling, and devastated cities are indeed very similar in their performance.

APPENDIX C: FUZZY MEMBERSHIP SCALES

The tables below contain the scales that were used to transform the interval-level variables for change in sector-level employment into fuzzy sets for types of sector-level change.

	Manufacturing	Wholesale/Ret.	FIRE
In the target set	≥ 0	≥ 3	≥ 2.5
Probably in the target set	0 to -6.7	3 to 2	2.5 to 1.8
More in than out of the target set	-6.7 to -11.7	2 to 1.6	1.8 to 1.5
More out than in the target set	-11.7 to -16.7	1.6 to 1	1.5 to 1.2
Probably out of the target set	-16.7 to -20	1 to .3	1.2 to .7
Out of the target set	≤ -20	≤ .3	≤ .7

	Business Srv.	Personal Srv.	Professional Sv
In the target set	≥ 4.5	≥ 3.5	≥ 15
Probably in the target set	4.5 to 4.2	3.5 to 3	15 to 10
More in than out of the target set	4.2 to 4	3 to 2.5	10 to 6
More out than in the target set	4 to 3.8	2.5 to 2	6 to 5
Probably out of the target set	3.8 to 3.5	2 to 1.5	5 to 3
Out of the target set	≤ 3.5	≤ 1.5	≤ 3

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Personal interview, 1/10/07b, Grand Rapids, Michigan.

Personal interview, 1/11/07, Grand Rapids, Michigan.

Personal interview, 1/13/07, Flint, Michigan.

Personal interview, 1/16/07, Flint, Michigan.

Personal interview, 1/17/07a, Flint, Michigan.

Personal interview, 1/17/07b, Flint, Michigan.

Phone interview, 1/23/07.

Personal interview, 1/29/07, Akron, Ohio.

Personal interview, 1/30/07a, Akron, Ohio.

Personal interview, 1/30/07b, Akron, Ohio.

Personal interview, 1/30/07c, Akron, Ohio.

Personal interview, 1/31/07a, Flint, Michigan.

Personal interview, 1/31/07b, Flint, Michigan.

Personal interview, 1/31/07c, Flint, Michigan.

Personal interview, 2/5/07, Toledo, Ohio.

Personal interview, 2/6/07, Toledo, Ohio.

Personal interview, 2/7/07a, Toledo, Ohio.

Personal interview, 2/7/07b, Akron, Ohio.