

## **Economic Shocks and Regional Economic Resilience**

**Edward Hill<sup>1</sup>**  
**Travis St. Clair<sup>2</sup>**  
**Howard Wial<sup>3</sup>**  
**Hal Wolman<sup>4</sup>**  
**Pat Atkins<sup>5</sup>**  
**Pamela Blumenthal<sup>6</sup>**  
**Sarah Ficenec<sup>7</sup>**  
**Alec Friedhoff<sup>8</sup>**

Draft May 10, 2010

Prepared for Brookings, George Washington, Urban Institute, Building Resilient Region Project conference on Urban and Regional Policy and Its Effects: Building Resilient Regions, Washington, DC, May 20-21, 2010.

---

<sup>1</sup> Cleveland State University

<sup>2</sup> George Washington Institute of Public Policy

<sup>3</sup> The Brookings Institution

<sup>4</sup> George Washington Institute of Public Policy

<sup>5</sup> George Washington Institute of Public Policy

<sup>6</sup> George Washington Institute of Public Policy

<sup>7</sup> George Washington Institute of Public Policy

<sup>8</sup> The Brookings Institution

## **Introduction:**

Economic shocks occur periodically to metropolitan economies, though the effect that these shocks have varies from region to region as does the region's adjustment and recovery to them. In this paper we examine the nature and extent of these shocks, their effects on regional economies (some regional economies are resistant to shocks, while others suffer substantial downturns), and the resilience of regional economies to these shocks. We are particularly concerned with regional economic resilience: why are some regional economies that are adversely affected by shocks able to recover in a relatively short period of time while others are not?

Economic resilience is a concept that is frequently used but rarely well defined. Conceptually, Pendall, Foster, and Cowell posit two separate, though not necessarily unrelated, concepts. The first is based on "equilibrium analysis," in which resilience is the ability to return to a pre-existing state in a single equilibrium system or shift to new "normals" in multiple equilibrium systems. The second defines resilience in terms of complex adaptive systems and relates to the ability of a system to adapt and change in response to stresses and strains. In this paper we focus on the first definition of resilience.<sup>1</sup>

For regional economic analysis, perhaps the most natural meaning of economic resilience is the ability of a regional economy to maintain or return to a pre-existing state (typically assumed to be an equilibrium state) in the presence of some type of exogenous (i.e., externally generated) shock. Although only a few studies explicitly use the term "resilience," the economic literature that deals with the idea of resilience typically is concerned with the extent to which a regional or national economy is able to return to its previous level and/or growth rate of output, employment, or population after experiencing an external shock.<sup>2</sup>

A related concept of resilience is the extent to which a regional economy avoids having its previous equilibrium state disrupted by an exogenous shock. This could involve avoiding the shock altogether (e.g., by having a regional economy that is not dependent on an industry that is likely to experience a negative demand shock) or withstanding the shock with little or no adverse

---

<sup>1</sup> Pendall, Foster, and Cowell (2009, pp. 2, 6).

<sup>2</sup> See, e.g., Blanchard and Katz (1992), Rose and Liao (2005), Briguglio, Cordina, Farrugia and Vella (2006), Feyrer, Sacerdote, and Stern (2007). Although these macroeconomic indicators are commonly used, it is also possible to apply this and other resilience concepts to other measures of regional economic performance, such as wage inequality or measures of environmental sustainability.

impact (e.g., by having sufficiently diversified economy that the shock has little macroeconomic effect.<sup>3</sup> Alternatively, or in addition, resilience could involve the extent to which the initial impact of a shock is dampened, so that the region does not experience large swings in output or other macroeconomic variables; this concept of resilience embodies a preference for regional macroeconomic stability.<sup>4</sup>

We conceptualize regional economic resilience as the ability of a region (defined for the purpose of this paper as a Census-delineated metropolitan area) to recover successfully from shocks to its economy that throw it substantially off its prior growth path and cause an economic downturn. Shocks can be of three kinds: 1) shocks caused by downturns in the national economy (national economic downturn shocks); 2) shocks caused by downturns in particular industries that constitute an important component of the region's export base (industry shocks), and 3) other external shocks (a natural disaster, closure of a military base, movement of an important firm out of the area, etc.).<sup>5</sup> These shocks are not mutually exclusive; a regional economy may experience more than one simultaneously.

Not all shocks throw an economy substantially off its prior growth path. When a shock occurs that does not cause the region to be thrown off its prior growth path – i.e., it does not experience an economic downturn – we term the region “shock-resistant” to that shock. If the region is adversely affected by the shock, we consider it “resilient” if it returns to its prior growth path within a relatively short period of time. If it does not, we consider it “non-resilient.” We operationalize these concepts below. Being shock-resistant is the best outcome for a regional economy (at least in the short run), followed by being resilient, with the least desirable outcome being non-resilient.

Note that economic resilience can occur because the region's economy simply bounces back (e.g., because of favorable shifts in the demand for its products), as a result of undergoing in its industry structure, or through less radical economic changes (e.g., existing firms adopt better technologies or organizational forms or produce new products). The key question is what is happening to the competitive position of the region's economic base, and how the region responds to changes in the competitive position of its base. Note also that a return to its prior

---

<sup>3</sup> Briguglio, et al. (2006).

<sup>4</sup> Duval, Elmeskov, and Vogel (2007).

<sup>5</sup> In this paper, we follow common usage in regional economics and use the term “export,” at the regional level, to refer to goods and services that are produced in a region but consumed mainly by people who live in other regions. Those other regions may be located in either the United States or other countries.

growth path is not necessarily a good thing, particularly if the prior growth path was low or stagnant (although it is presumably a better thing than stabilizing at an even lower level).

## **Understanding and Accounting for Regional Economic Resilience**

Research that describes patterns of regional economic resilience or explains why regions are or are not economically resilient or shock-resistant is rather sparse. The descriptive literature finds that U.S. states, counties, and metropolitan areas that experience employment shocks generally recover to their pre-shock unemployment rates but not to their pre-shock employment levels within eight or fewer years. The main reason why unemployment rates recover relatively quickly while employment levels do not is that unemployed workers in the United States quickly leave regions that have experienced large job losses, while the lack of immigration of new job-seekers helps the region's unemployment rate to recover. Employers, on the other hand, do not relocate jobs to regions that have experienced large employment shocks.<sup>6</sup>

The available evidence shows that shocks permanently lower employment in regions that experience them. Blanchard and Katz find that at the state level, employment shocks typically result in employment declines for about four years. After that, states eventually return to their pre-shock employment growth rates (and are, therefore, resilient in the sense in which we use that term) but they start from a permanently lower post-shock employment level.<sup>7</sup> Feyrer, Sacerdote, and Stern reach an even more pessimistic conclusion about economic resilience in their study of counties that lost steel and auto manufacturing jobs between 1977 and 1982. They find that employment and population in these counties grew slightly a few years after experiencing this employment shock but that they then failed to grow at all during approximately two decades following the shock.<sup>8</sup>

The regional literature points to several features of regions that may make their economies more likely to recover from shocks or less likely to experience them in the first place. Feyrer, Sacerdote, and Stern find that counties that experienced auto and steel job losses in the late 1970s and early 1980s had higher post-shock population growth if they had warm, sunny

---

<sup>6</sup> See Blanchard and Katz (1992), Bartik and Eberts (2006), Feyrer, Sacerdote, and Stern (2007).

<sup>7</sup> Blanchard and Katz (1992).

<sup>8</sup> Feyrer, Sacerdote, and Stern (2007).

climates and were located near large metropolitan areas.<sup>9</sup> Kolko and Neumark, in a study of the impact of regional and industry employment shocks on establishment-level employment, find that employment in corporate headquarters and, to a lesser extent, in small, locally owned chains, is less likely to decline in response to these shocks.<sup>10</sup> Therefore, high concentrations of these types of businesses would be expected to make regions more shock-resistant.

Other literature on regional economic growth, although not about resilience per se, suggests hypotheses that may be relevant to the analysis of resilience. One strand of research emphasizes the role of product and profit cycles in regional growth; it suggests that regional economies can be renewed if their firms can introduce new goods or services for export from the region or use new technologies to produce such goods and services.<sup>11</sup> A second strand examines the unresolved question whether industrial specialization or industrial diversification better promotes growth.<sup>12</sup> A third line of research suggests that human capital (the educational attainment or skills of the region's workforce) is a major driver of growth.<sup>13</sup> Some accounts of the revitalization of New England in the 1980s posit that low wages for skilled workers were necessary to restart the region's growth.<sup>14</sup> Finally, some literature suggests that the domination of regional labor markets, suppliers, R&D pipelines, or channels of informal business association and communication by a few large, vertically integrated firms may inhibit the growth of other firms.<sup>15</sup> All these potential determinants of regional growth are potentially determinants of regional economic resilience as well.

The literature on international economic development may also contribute some insights that are relevant to regional economic resilience. Duval, Elmeskov, and Vogel, in a study of the reasons why shocks to national economies occur and persist, find that public policies that restrict firms' ability to lay off or reassign workers make shocks less severe but also make them last longer.<sup>16</sup> At the regional level, this may suggest that state and local policies that inhibit layoffs or promote unionization have similar effects. Briguglio and others develop an index of national

---

<sup>9</sup> Feyrer, Sacerdote, and Stern (2007).

<sup>10</sup> Kolko and Neumark (2010).

<sup>11</sup> Desmet and Rossi-Hansberg (2009), Duranton and Puga (2001), Markusen (1985), Norton and Rees (1979).

<sup>12</sup> Glaeser and others (1992), Henderson, Kuncaro, and Turner (1995), Harrison, Kelley, and Gant (1996), Henderson (2003).

<sup>13</sup> Glaeser and Saiz (2004), Glaeser, Scheinkman, and Shleifer (1995), Gottlieb and Fogarty (2003), Simon (1998).

<sup>14</sup> Flynn (1984), Harrison (1984).

<sup>15</sup> Chinitz (1961), Safford (2009), Christopherson and Clark (2007).

<sup>16</sup> Duval, Elmeskov, and Vogel (2007).

economic resilience based on several hypotheses about resilience, including the hypothesis that the concentration of a nation's exports in a few industries inhibits resilience.<sup>17</sup> This suggests a similar hypothesis for regional export industries (as distinct from the hypotheses about overall regional economic diversification noted above). Finally, there is a growing body of international quantitative evidence that national and region-specific institutions, behavioral norms and customs, knowledge, and technology have long-lasting impacts on the economic development of countries and regions.<sup>18</sup> Although these concepts are difficult to apply in quantitative studies of regional economies within the United States, they are relevant to regions' ability to avoid or recover from economic shocks.

In this paper we draw on the literature surveyed above to examine the importance of various potential determinants of regional economic resilience. We do so through quantitative analysis where possible. We supplement that analysis with insights from qualitative case studies of six metropolitan areas. The case studies enable us to look at the role of institutions, norms, and other potential influences on resilience for which we have no quantitative data.

## **Research Design and Concept Operationalization**

We will proceed by first presenting simple descriptive statistics on economic shocks, their effects on regional economies, the extent to which regions are resistant to various types of shocks, and, if they are not shock-resistant, whether they are resilient or non-resilient after suffering the adverse effects of the shocks. We will then present four analytical models. We will attempt to explain 1) the likelihood of a region experiencing a downturn in response to a shock in a given year; 2) whether individual shock-episodes resulted in downturns or not, 3) whether individual regions were resilient or non-resilient to downturns, and 4) the time it took for regions, once adversely affected by a shock, to be resilient.

To accomplish these tasks we need to operationalize our key concepts: economic shocks, shock-resistance, downturns, and resilience as well as terms that are related to these definitions (such as prior growth paths).

---

<sup>17</sup> Briguglio et al. (2006).

<sup>18</sup> For a survey of recent studies see Nunn (2009).

We begin with economic shock, of which there can be several kinds. A *national economic downturn* shock is a shock to the national economy as a whole. We define such a shock to occur when, in any year (which we call the base year), the *national* growth rate (separately for employment and for gross metropolitan product) declines by more than 2.0 percentage points from its annual growth rate over the previous eight years.<sup>19</sup>

An *industry shock* affects one or more of a region's major export industries. (For a given year a three-digit NAICS industry is defined as a major export industry in a region if its share of regional employment is at least 1.0 percent and is at least 80 percent above the same industry's share of national employment.) A region suffers an industry shock when the job loss experienced by export industries in a particular year represents a one-year annual decline of more than 0.75 percent of aggregate metropolitan employment. Industry shocks can be national (i.e., a shock to an industrial sector nationally) or local (a shock that occurs to an industry at the regional but not the national level).

- A *national* industry shock occurs if the 3-digit industry that contributes the *largest* share of employment loss to the region's export base when the region experiences an industry shock is also in shock at the *national* level.<sup>20</sup>
- A *local* industry shock occurs when the region's export base has an employment decline of more than 0.75% of aggregate metropolitan employment and the region's largest export industry has *not* experienced a shock at the national level.

Non-economic shocks to a region's economy can result from natural disasters, terrorist attacks or other non-economic events that have the potential to adversely affect the regional economy.

Not all shocks adversely affect regional economies. If a shock occurs and a regional economy is not adversely affected by the shock event, the regional economy is termed "*shock-resistant*." A region is adversely affected by a shock if, in the *year of the shock or the year*

---

<sup>19</sup> The previous eight-year growth rate is measured by the slope of the regression line of the log of employment for the previous eight years. If the prior eight year growth rate is 4.0 percent or higher, then the growth rate in the base year must decline by the number of percentage points equal to more than half of the prior eight year growth rate. Our use of a decline in the growth rate to measure shocks is analogous to Hausmann, Pritchett, and Rodrik's use of an increase in the growth rate to measure growth accelerations. See Hausmann, Pritchett, and Rodrik (2004).

<sup>20</sup> An industry is considered to be in shock at the national level if it meets the same criteria as a national *downturn* shock: the industry's annual employment growth rate declines by more than 2.0 percentage points from its eight-year growth rate, etc.

*thereafter*, its economy experiences a substantial economic downturn, defined as a decline of more than 2.0 percentage points from the annual *regional* growth rate over the previous eight years.<sup>21</sup> However, if the eight year growth rate was 4.0 percent or higher, then the region's growth rate had to decline by more than half of the previous eight-year average growth rate. If the region did not undergo a downturn in the year of the shock or the year thereafter, it is considered shock-resistant.

A region that undergoes an *economic downturn* as a result of a *shock* can be either *resilient* to the shock or *non-resilient* to it. A region is *resilient* if, within four years of the onset of the downturn, its annual growth rate returns to the eight year growth rate prior to the year the downturn occurred.<sup>22</sup> If it does not do so within four years, we term it *non-resilient*.

### **Counting Shocks and Their Effects on Regions**

Using our operational definition and employing metropolitan-level employment data from Moody's economy.com for 1970-2007, we identify 1476 incidents of identifiable shocks to regions between 1978 and 2007 (see table 1). Of these, *national economic* shocks, which occurred during 1981, 1990, and 2000-2001, accounted for 661 instances<sup>23</sup>, of which 82 occurred in conjunction with a local industry shock and 173 occurred with a national industry shock. There were 663 instances of local industry regional shocks and 407 instances of national industry shocks to regions. In addition there were 292 downturns due to unidentifiable causes (that is cases where a region's employment growth rate declined by two or more percentage points from that of the prior eight year average even in the absence of a national economic downturn or a national or local industrial shock).

---

<sup>21</sup> In the case that two separate industry shocks occur in the years preceding and concurrent with a downturn, one a national industry shock and one a local industry shock, we look at the first year of the shock to determine whether the shock was local or national in nature.

<sup>22</sup> If a new "secondary" downturn begins before a region has been deemed resilient or non-resilient to the previous downturn, the region will have four years from the *end* of the secondary downturn in which to return to its eight year growth rate from prior to the *original* downturn year.

<sup>23</sup> There were three national economic shocks during the 1978-2007 period: 1981, 1990, and 2000-2001. Since there are 361 metropolitan areas, that should have resulted in nearly 1000 shock instances. However, we have not counted as shock instances those shocks that occurred while a region was still being affected by a prior shock (see previous footnote). As a result the total number of national economic shocks amounted to only 661 instances.



Of the 1,476 identifiable shocks, regions were shock-resistant to almost half of those shocks (47%) – they did not suffer a serious economic downturn as a result of the shock. Regions were less likely to be shock-resistant to national economic downturn shocks and national industry shocks than to local industry shocks. Not surprisingly, they were also less likely to be shock-resistant to multiple shocks, i.e., when two types of shocks occurred simultaneously. Regions were adversely affected, i.e., suffered a substantial economic downturn, in 775 (53%) of these shock incidents.

Regions suffering a downturn as a result of a shock were “resilient” 65% of the time, i.e., they returned to at least their prior eight year average employment growth rate within a reasonably short period (four years). The average length of time from the onset of the downturn to recovery for a region was 2.9 years.

As Table 1 indicates, regions that were adversely affected by a shock were less likely to be resilient if the shock was a national economic downturn alone (to which 55% of adversely affected regions were resilient) than if it were a national industry shock alone (80% resilient) or a local industry shock alone (77% resilient).

There was virtually no regional variation in the extent to which metropolitan areas were resistant to shock or, once adversely affected, they were resilient. The one exception was that

**Table 1. Shocks by Type and Their Effects on Regions**

<b>Shock Type and Effect</b>				<b>Of Those That Resulted in Downturns</b>		
Type of Shock	Did not Result in Downturn (Metro was Shock-Resistant)	Resulted in Downturn	Total	Metro was Resilient to Downturn	Metro was Non-Resilient to Downturn	Average Length to Recovery for Resilient Metros
National Economic Shock	221 (33%)	440 (67%)	661 (100%)	245(56%)	195 (44%)	2.8 years
Alone	183(45%)	223 (55%)	406 (100%)	122 (55%)	101 (45%)	2.8 years
with Local Industry Shock	9(11%)	73(89%)	82(100%)	44 (60%)	29 (40%)	3.0 years
with National Industry Shock	29(17%)	144(83%)	173(100%)	79 (55%)	65 (45%)	2.6 years
Local Industry Shock	383 (58%)	280 (42%)	663 (100%)	204 (73%)	76 (27%)	2.9 years
Alone	374(64%)	207 (36%)	581(100%)	160 (77%)	47 (23%)	2.8 years
with National Economic Shock	9(11%)	73 (89%)	82(100%)	44 (60%)	29 (40%)	3.0 years
National Industry Shock	135 (33%)	272 (67%)	407 (100%)	181 (67%)	91 (33%)	2.9 years
Alone	106(45%)	128(55%)	234(100%)	102 (80%)	26 (20%)	3.1 years
with National Economic Shock	29(17%)	144(83%)	173(100%)	79 (55%)	65 (45%)	2.6 years
Total Shocks (Not Double-Counting)	701 (47%)	775 (53%)	1476 (100%)	507 (65%)	268 (35%)	2.9 years

metropolitan areas in the northeast were somewhat less likely to be resilient in the face of an economic downturn (53%) compared to the national average (65%).

## **Explaining Shock-resistance and Resilience**

In this section we move from description to analysis. We consider four questions:

- What accounts for economic downturns as we have defined them, i.e., what are the characteristics associated with areas that experience downturns of their regional economies compared to those that do not?
- Why are some regions adversely affected when an economic shock occurs (i.e., experience an economic downturn as we define it), while others are not (i.e., are shock-resistant)?
- When experiencing an economic downturn, why are some areas “resilient” in that they return to their previous growth rate within a relatively short period of time while others do not?
- What accounts for the length of time it takes a region that is experiencing an economic downturn to recover (i.e., to be “resilient” by our definition)?

We specify and estimate economic models addressed to each of these questions.

## **Data and Analysis**

Our data for all of the models consist of total employment from 1970 through 2007 for the 361 metropolitan statistical areas in the United States. Since our definition of an economic downturn requires eight prior years of employment data and one subsequent year, the years available for analysis are limited to the 29 years from 1978 through 2006. Each of the models includes only a subset of observations depending on the variable of interest.

We employ a series of independent variables in the regressions that attempt to capture features of the different regions’ economic structure, labor force, demographic and other characteristics that, based on the literature related to economic resilience reviewed above, might

be related to shock-resistance and/or resilience (see the appendix for data definitions and sources, regression results, and summary statistics).

To test whether regional economic resilience is related to characteristics of the region's economy we include variables on the sectoral composition of the region's economy, selecting sectors that are likely to reflect different export sector configurations: the percentages of employment in durable manufacturing, non-durable manufacturing, health care and social assistance,<sup>32</sup> and tourism-related industries. While we were unable to include data on employment in the higher education sector (another export-base sector), we did include a variable consisting of a count of the number of research universities in the metropolitan area involved in high and very high research activity (according to the Carnegie Foundation's classification system). We also included a measure of economic diversity, a Herfindahl index (which measures the extent to which the regional economy is concentrated in a few sectors or diversified among many) and a measure of regional concentration, the number of export-based sectors in the region, to assess the frequently asserted proposition that more diverse and less concentrated regional economies are more resilient. Finally, we also include a variable capturing the rate of employment growth prior to a downturn to test whether previously rapidly growing regions were more likely to experience economic downturns, be susceptible to shock and/or be less resilient.

To examine the effect of labor force and labor market institutions, we included a skill variable - the percentage of the population aged 25 and older who possess no more than a high school education – to assess whether areas with a higher proportion of low-skilled labor are likely to be more susceptible to economic downturns and less resilient in terms of recovery, as well as demographic characteristics including the percentage of the population that is non-Hispanic black and Hispanic. As one indicator of labor market flexibility, we include a variable for whether the region is wholly or predominantly in a state that has a right-to-work law, since, as noted above (p. 5); such laws may make labor markets more flexible in a way that makes regions both more resilient and less shock-resistant<sup>33</sup>.

We also include background characteristics of metropolitan areas that might affect shock-resistance and/or resilience. To determine whether the size of a region matters (and also to

---

<sup>32</sup> Health care is lumped together with social assistance at the two-digit NAICS level.

<sup>33</sup> See Blumenthal, Wolman, and Hill (2009)

<sup>33</sup> See Blumenthal, Wolman, and Hill (2009)

standardize other variables for size differences) we include a lagged employment variable. We also include variables on the age of the metropolitan area (as expressed by the number of years since the principal city attained a population of 50,000) and the percentage of the region's population who reside in the central city. Age of the metropolitan area is frequently used as a proxy for the match between an area's urban form and modern transportation needs as well as for the structure and condition of the urban infrastructure (with the implication that older areas are likely to have less effective and efficient infrastructure, more prone to breakdown and need for repair). In both cases, older areas are hypothesized to be less "resilient." The proportion of the metropolitan population residing in the central city is used as a rough proxy for the influence of the central city in regional decision making. Since it is sometimes argued that income inequality makes flexible regional responses more difficult we use a variable that is the ratio of the income of high-income households to that of low-income households in the region.<sup>34</sup>

We also include variables capturing the three different kinds of shocks (national economic downturn shock, national industry shock, and local industry shock as previously defined) in tandem with each other or alone to test whether shock-resistance and/or resilience are related to shock type. Finally, to capture the effect of omitted variables that might vary by region, we include variables for each of the four regions of the country (Northeast, Midwest, West, and South); the West is the baseline region to which the other regions are compared.<sup>35</sup>

*Explaining the occurrence of regional economic downturns.* The first model examines the regional characteristics that influence whether or not a region will suffer a downturn. We employ a hazard model, a model in which the dependent variable measures the duration of time that an entity spends in a steady state before experiencing a particular event.<sup>36</sup> For example, a hazard model might be used to study the amount of time it takes until an innovation is adopted

---

<sup>34</sup> Technically, we measure the ratio of a region's household income at the 80<sup>th</sup> percentile to that of its household income at the 20<sup>th</sup> percentile. An argument about the relationship between regional economic inequality and regional economic growth can be found in Pastor and Benner (2008).

<sup>35</sup> We also collected data on average July temperature, net migration, and the percentage of establishments of a certain size. We discarded the temperature variable as we found it to be highly correlated with the regional dummies. The migration and firm size data were limited to certain years (see footnotes below).

<sup>36</sup> Specifically, we use the Cox proportional hazards model. The Cox model is different from parametric models in that it leaves the hazard rate unparameterized; that is, it makes no a priori assumptions about the shape of the hazard. The hazard rate represents the risk of experiencing an event, given that the entity in question hasn't experienced it yet. Box-Steffensmeier and Jones (2004) have argued that in most settings the Cox model is preferable to parametric alternatives due to its less strict assumptions about the data-generating process.

by state governments. Some states may adopt an innovation in the first year after its initial development, others in the second year, some in the seventh year, etc. A hazard model predicts when the event will occur and the independent variables in the model measure the effect of each on the probability that it will occur in a given year. The event of interest in this case is a regional economic downturn, defined as a decline of at least two percentage points in the prior eight year average annual employment growth rate. Model 1 thus estimates how much time occurs until a metropolitan area experiences a downturn. This is equivalent to asking what conditions contribute to an area suffering a downturn in a given year.

The unit of analysis is a regional economy-year (i.e., each of the 361 metropolitan areas in each of the 29 years is a separate observation).<sup>37</sup> Since the model seeks to answer the question, how much time occurs until a metropolitan area experiences a downturn, we used only those observations when a metropolitan area was not already in a downturn and thus was capable of suffering from a new one.

The results of the first model are presented in Table 2. Positive coefficients on a variable indicate an increase in the risk of a metropolitan area experiencing a downturn, given that one hasn't already occurred.<sup>38</sup> Negative coefficients indicate a decrease in the risk of a downturn occurring. The results can also be discussed in terms of hazard ratios, which allow for easier substantive interpretation. A hazard ratio of 1 suggest that a one-unit increase in a variable does not change the risk of experiencing the event in question, given that it hasn't already occurred. A hazard ratio of 2 suggests that a one unit increase in a variable doubles the risk of experiencing the event, given that it hasn't already occurred. Variables that are expressed as a percentage have been standardized so that their values fall between 0 and 100 (rather than 0 and 1.0), allowing for more meaningful interpretation of the hazard ratios (see appendix for summary statistics).

---

<sup>37</sup> It is necessary to point out several features of our data that bear on the sort of hazard model we used. The data set is characterized by repeated events, time-varying co-variates, and discrete time intervals. There are multiple events per entity; that is, each metro area is capable of suffering multiple downturns. The data include both time-varying and time-invariant covariates. Finally, the data points represent discrete time intervals; each observation is based on the calendar years between 1978 and 2007. The "events" (in this case, downturns) are also ordered. In other words, we do not assume that the events are independent of one another, and thus we make use of a variance correction model to account for the different baseline hazards. We apply the conditional gap time correction to the standard Cox model as recommended by Box-Steffensmeier and Zorn for sequential repeated events, using the Efron method to account for coterminous event occurrences or "ties." The model stratifies by the order in which the event occurs and uses robust variance estimates. See Box-Steffensmeier and Zorn (2002). Standard errors are clustered by metropolitan area.

<sup>38</sup> In the case that a metro experienced a downturn previously, then this can be taken to mean that a downturn has yet to occur in the years *since* a previous downturn. In other words, after a downturn occurs and is resolved, the area can once again experience another downturn

The main results from this model are the following.

- A region's industry structure affects the probability that the region will experience a downturn. Durable goods manufacturing makes a region more susceptible to economic downturns, while health care and social assistance makes it less so. A one percentage point increase in a region's employment in durable manufacturing increases its probability of downturn in a given year by 1.9 percent, while a one point increase in employment in the health care and social assistance sector reduces its probability by more than 10 percent.
- Having a large number of major export industries makes a region *less* likely to experience a downturn, suggesting that the less concentrated the export sector (i.e., the larger the number of industries that are major exporters) the more protected the region is from economic shocks.
- Regions in which a large share of the population has low levels of formal schooling (no more than a high school diploma) are more susceptible to downturns.
- Regions experiencing a national industry shock, especially when it is in tandem with a national economic downturn shock, are more likely to have a downturn than regions facing other types of shocks.<sup>39</sup>
- Metropolitan areas in the Northeast and South and, to a lesser extent, the Midwest are less susceptible to economic downturns than those in the West.
- Regions with large income gaps between high- and low-income households are more susceptible to downturns than those with lower levels of income inequality.

Most of these results make sense in light of the cyclical nature of employment patterns. Durable goods manufacturers will hire more workers when demand for these goods rises and lay them off when demand falls (a cyclical effect). Export industries, many of which are in manufacturing, may have employment patterns that are more cyclical than other industries, but, except in general national economic downturns, they are unlikely to follow similar cycles. Thus,

---

<sup>39</sup> Endogeneity may be a concern insofar as the model does not account for migration. More working age, educated adults may flee from regions that are hard-hit in favor of regions that are doing well. To account for this, we also ran a specification that included a variable for lagged net migration as a percentage of the population. Migration data is only available since 1991, which severely limits the number of observations. When the model was run, all of the variables discussed above retained their signs except for the number of export industries and the dummy variable for the Midwest, neither of which remained statistically significant.

the more major export industries a region has, the less likely that all or a large number of these industries will suffer industry shocks simultaneously; the lack of concentration in a small number of export industries protects them against industry shocks substantial enough to trigger a regional economic downturn (a portfolio diversification effect). In response to a decline in the demand for their products or services, employers of all types are more likely to lay off non-professional and non-managerial workers, who typically have lower levels of formal education than professionals and managers.

*Explaining Shock Resistance:* Model 2 is a logistic regression that examines what makes regions “shock-resistant” (i.e., they do not suffer an economic downturn) once they have experienced a shock. This model differs conceptually from model 1 because it considers only instances in which a region has experienced some sort of shock, while model 1 includes all metropolitan areas in all years, regardless of whether a shock has occurred in a metropolitan area. Each observation represents a year in which a region suffered from at least one type of shock. As with the previous model, we exclude those observations where a region was already in a downturn and thus could not be adversely affected by further shocks. We excluded national economic downturn shocks from the model, and thus the results for the other types of shocks should be interpreted as the odds of a type of shock causing a downturn *relative to* the odds of a national economic shock causing a downturn.

We employed logistic regression to explore those factors that contributed to a region’s shock resistance.<sup>40</sup> The odds ratio for a logistic regression can be interpreted as the increase in the odds of an event occurring produced by a one unit increase in the independent variable. Odds are the ratio of the probability of an event occurring to the probability of it not occurring. If the odds ratio for an independent variable in Model 2 is greater than 1.0, then an increase in the variable will increase the odds that a shock results in a downturn. For example, a one unit increase in durable employment (in this case, the unit is a percentage point) increases the odds of a downturn occurring by a factor of 1.024. If the odds ratio is less than one, then an increase in the independent variable reduces the odds of a downturn occurring. A local industry shock

---

<sup>40</sup> We move away from the hazard model and instead employ logistic regression in this case because we are no longer interested in the duration between events. Shocks occur at a moment in time and either result in a downturn or do not.



reduces the odds of a downturn occurring by 0.516 ( $1.000 - 0.484$ ) relative to the case in which the area experienced a national economic downturn shock.

The principal results of this model (shown in Table 3), are as follows.

- Some of the regional characteristics that make a region more or less likely to experience a downturn also affect the region's chances of being shock-resistant once a shock has occurred. Durable goods manufacturing, health care and social assistance, a large number of major export industries, and a less educated population affect shock resistance in the same way they affect the occurrence of shocks, and likely for the same reasons.
- Regions whose *export base* is less concentrated are less more likely to be shock resistant. A one unit increase in the number of export-based sectors (i.e., one additional export base sector) decreases the odds of a downturn occurring by .072.
- However, regions whose overall economic structure is more diverse (as measured by the Herfindahl index) are likely to be less shock-resistant. Higher values on the index represent less diversification at the 2-digit NAICS level. Thus, a one unit increase in the Herfindahl Index (meaning an increase in overall concentration) decreases the odds of a downturn by 0.024.
- Regions experiencing national economic downturn shocks in tandem with local industry shocks are more likely to experience economic downturns, while those facing local industry shocks alone are least likely.

*Explaining regional responses to economic shocks:* Model 3 examines the regional characteristics that influence whether a metropolitan area economy that experienced an economic downturn was resilient, i.e., it rebounded to its annual average eight year growth rate prior to the downturn. Like the prior model, model 3 is a logistic regression. In this case, the model treats each of the downturns that metropolitan areas experience as separate observations and looks at the factors that contribute to whether or not a metropolitan area is resilient to a particular downturn.

The results for model 3 are presented in Table 4. They are broadly similar to those of model 1, the model accounting for regional economic downturns. Having a large percentage of

the population with a high school education or less and the percentage of employment in durable manufacturing make metropolitan areas resilient to shocks. Just as cyclical demand for durable goods makes employment in that sector susceptible to downturns, so too does the eventual uptick in demand allow it to be resilient. These variables may simply express the cyclical nature of durable goods manufacturing and of the low-skilled labor market.

Other important findings from model 3 are:

- Right-to-work laws appear to have a positive effect on resilience. Regions with more flexible labor markets may be more likely to recover employment after it has been temporarily lost. The odds of a region being resilient are nearly 2.2 times greater if it is located in a state which has Right to Work laws compared to if it is located in a state without such laws.

Metropolitan areas in the Northeast or South, while, as we have described above, less likely to experience downturns, are significantly less likely to be resilient in the face of those downturns than are regions in the West.

*Explaining Length of Time to Resilience:* Model 4, a hazard model in the form of model 1, is directed at a slightly different aspect of resiliency than is model 3 above. Here the concern is not what determines *whether* a region is resilient, but what determines *how long* it takes after a downturn occurs for a region to become resilient. This model is limited to those observations when metropolitan areas are already in a downturn and excludes years when a metropolitan area is in a growth period.<sup>41</sup> The results are presented in Table 5.<sup>42</sup> By exploiting the full time-series cross-sectional nature of the data, the hazard model includes more observations than does the logit model used for model 3, and thus more variables attain statistical significance.

Some of the same results of this model are the same as those of model 3. A high percentage of the population with no more than a high school education, a high percentage of

---

<sup>41</sup> We censor those observations in which a metro area is deemed non-resilient to a downturn; that is, the full amount of time it takes for these metros to recover from the downturn, if they do recover, is considered to be unobserved in the data.

<sup>42</sup> As with model 1, we re-estimated model 4 adding a variable for lagged net migration as a percent of the population. This enabled us to address potential sources of simultaneity, though the decreased number of observations made it more difficult to achieve statistically significant results. All of the variables discussed achieved the same sign in the re-estimated model, with the exception of the 80-20 income ratio. However, one variable that was not included in the original model and that also may be a proxy for entrepreneurship did achieve statistical significance; a one unit increase in the percent of establishments with less than 20 employees increases the likelihood of recovery by 18 percent, given that it has not already occurred.

employment in durable manufacturing, and the presence of right-to-work laws all reduce the amount of time it takes the region to become resilient following a regional economic downturn.

In addition:

- The type of shock also matters for time to resilience. If a national economic downturn shock precedes a regional economic downturn, then the likelihood of the region recovering is 63 percent higher in a given year than if there were no identifiable economic shock.
- The higher a region's pre-downturn growth rate, the longer it will take for the region's economy to become resilient. This makes sense as, based on our definition of resilience, a region that grows very rapidly prior to a downturn will have a more difficult time returning to its previous growth rate.
- However, the diversity of a region's economy, as measured by its Herfindahl index, is not significantly related to resilience.
- The presence of a large number of research universities appears to enable a region's economy to recover more quickly. This may be because research universities in a region lead to higher levels of commercialization and spin-offs.

### **Case Studies of Regional Resilience and Non-Resilience**

The descriptive and explanatory quantitative analyses presented above describe and explain regional economic downturns, shock-resistance, and resilience after having experienced a downturn. But they do not provide information on the processes that occurred, on the nature of conscious human activity applied or of its effect. In short, the quantitative analysis lacks depth and context. To provide a richer understanding of economic shock and resilience we undertook intensive case studies in six regions: Charlotte, Cleveland, Detroit, Grand Forks, Hartford, and Seattle. While we make no claim that these six regions are "representative," they do vary in the kinds of shocks that they have experienced and in their responses.

Charlotte was faced with an industry shock to its manufacturing as it became non-competitive in textiles. It was, however, resilient to the downturns it suffered and successfully underwent an economic transformation to an economy whose major export industry was banking and finance and related activities (intermediation and its related activities, including within the subsector such institutions as commercial banking or credit unions, such activities as credit card

issuing, and such jobs as mortgage loan brokers). The current national economic upheaval in the financial sector has produced a new shock to which the regional economy is now responding.

The Cleveland region, historically a manufacturing powerhouse, has experienced slow economic growth since the 1970s. While it has been able to recover from prior shocks to the national economy, the region has had difficulty adjusting its industrial composition to reflect changes in the economy, making it less resilient over time and ultimately non-resilient to the 2000 national economic downturn.

The Detroit region, the center of the American automobile industry, has experienced periodic shocks and downturns as a result of national economic downturns. Up until 2000 it proved resilient; it rebounded without any major changes in its industrial structure and resumed its prior growth path. However, it was not resilient in the face of the 2000 -2001 national economic downturn, and the automobile industry has been shaken to its foundations, leaving the region searching for solutions.

Grand Forks, a small metropolitan area in North Dakota, experienced a shock in the form of a devastating flood and a major military base closing during the 1996-1997 period resulting in a regional economic downturn. Its economy emerged from the downturn with a new and lower equilibrium growth rate.

Hartford experienced downturns as a result of shocks in its aerospace industry and related manufacturing industries in the early 1980s, to which it was resilient, and a downturn as a result of a major decline in its insurance and aerospace industries in the late 1980s, to which it was non-resilient. Seattle, with an economic base in aerospace manufacturing (Boeing) and, more recently, information technology (Microsoft), experienced periodic shocks to the former for many years and to the latter during the “tech bust” at the beginning of the 21<sup>st</sup> century. It was non-resilient to the downturn caused by a shock in the early 1980s shocks, but resilient to later shock-induced downturns in the early 90s and 2000s

*Detroit:*

**Economic Background and Shocks:** The Detroit region<sup>43</sup> has been dominated for nearly 100 years by the “Big Three” automakers (now Chrysler, Ford, and General Motors) and their suppliers. It now faces the decline of those firms and their supply chains as a result of both increasing competition from abroad and lower cost production sites within the United States.

Periodic regional economic downturns as a result of economic shocks have been the norm for the Detroit region. National economic downturns are shocks that disproportionately affect the sales and, thus, the production of motor vehicles, as consumers cut back on their purchases of durable goods. During the national recession of the early 1980s (1979-1982) employment in the Detroit region declined by 276,660 (15.2%) and employment in the automobile industry fell by 69,900 (33.9%). During a similar national economic downturn from 1989-1991, the region’s employment fell by 51,600 jobs (2.6%). The current regional downturn, however, has emphatically not been normal; it has been far more severe and more prolonged. From 2000 – 2008, the Detroit region lost 304,670 jobs (13.7%) overall and employment in the automobile industry has fallen from 240,465 to 205,350 (or 14.6%).

**Regional Economic Resilience/Non-Resilience:** Is the Detroit region resilient to economic shocks? In the past, the answer has clearly been yes. Simply put, when the national economy suffered, the automobile industry, and thus the region, suffered, and when the economy expanded, the auto industry and region grew. The region ultimately was resilient to economic downturns that occurred as a result of shocks in 1979 and 1989-90.<sup>44</sup> As shown in Figure 1, total employment rebounded after each national recession and actually increased from its 1978 level to its peak of 2,223,000 in 2000.

However, the most recent shock and response has been a different story. Prior to 2000, the region averaged an eight-year annual employment growth rate of 1.9%. Between 2000-2001

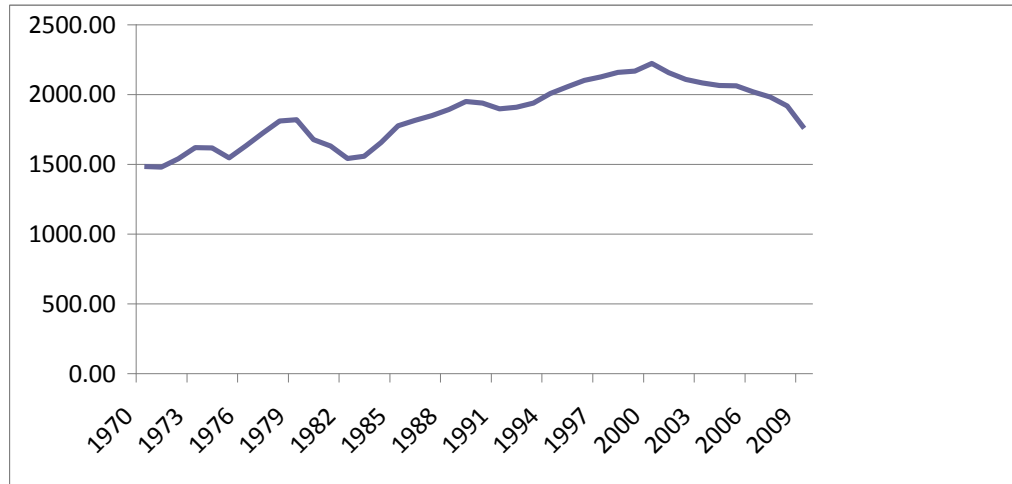
---

<sup>43</sup> For purposes of the data presented in this paper, the Detroit region consists of the Detroit Metropolitan Statistical Area (Wayne County (which includes the city of Detroit) plus the contiguous counties of Lapeer, Livingston, Macomb, Oakland, and St. Clair). However, Washtenaw County, home of Ann Arbor and the University of Michigan, is increasingly linked to the officially defined Detroit metropolitan area through economic ties and our discussion acknowledges this.

<sup>44</sup> Prior to the 1979 shock, the Detroit region’s prior average eight year employment growth rate was 2.2%. However, the annual growth rate declined by 7.9% from 1979-1980 but rebounded to 6.4% between 1983-1984 and to an even more vigorous 7.3% over the next year. Prior to the 1989 shock, the Detroit region’s prior average eight year employment growth rate was 3.0%. However, the annual growth rate fell 0.4% between 1989-1990 but rebounded to 3.7% by 1993.

employment fell by 3.0% and continued to decline every year after that through 2009. Over that nine year period total employment in the region declined by 20.1%.

Figure 1. Employment in Detroit Region, 1970-2009



**Explaining Resilience/Non-Resilience:** The explanation for resilience to the earlier shock-induced downturns is obvious; the national economy simply recovered. There was virtually unanimous agreement among those we interviewed that the recovery had nothing to do with policy or strategy interventions but rather to national economic turn-around. In effect, the region simply held its breath until things got better.

Unlike the previous two economic downturns, the Detroit region has not bounced back from the 2000-2001 downturn, and the effects of the national recession that began in 2008 have been piled on top of that. What does resilience mean in such a context? As one of our interviewees said, the region was hit by a truck – no one is resilient when hit by a truck. The collective regional response has been characterized as a movement from denial in the face of trends that were long evident - indeed, during the past 40 years regional leaders did little to adjust to trends in the automobile industry that some observers predicted would ultimately have a severe long-term affect on the region’s economy - to hopelessness and despair.

It is now publicly acknowledged by business and civic leaders (and also by many political leaders, though not always publicly) that the automobile industry, while it still will play the major role in the regional economy, is not going to be the job engine for the region that it has been in the past, at least as far as providing substantial employment for relatively low-skilled workers is concerned. Most people we interviewed predicted (or hoped), however, that the

region would remain the international center of automobile research, development, and engineering, and that these parts of the automobile industry would continue to be the major driver of the regional economy. Nobody we interviewed thought that motor vehicle employment, particularly in relatively low-skilled automobile assembly work, was likely to return to anywhere close to prior levels.

The difficulty that the region has had in developing collective responses and strategies to the downturn is, in part, a reflection of its historical legacy of adversarial and confrontational relationships. That legacy includes not only union-management conflict, but also conflict between blacks and whites, the city of Detroit and its suburbs, and county against county. As a consequence, positive social capital has been in short supply and there is little history of cooperation at the regional level or across jurisdictional or racial lines. Despite this, many interviewees agreed that the severity of the economic downturn has resulted in greater recognition of the need for cooperation and that some collaborative efforts are now taking place.

In addition, many of those we interviewed pointed to the prolonged domination of the Big Three as having created a culture of dependence and entitlement. Area residents have long believed that they and their children will be able to find well-paid employment with relatively little education in the auto industry. Suppliers to the auto industry have been characterized by a “procurement culture;” they have been able to prosper through procurement contracts from the Big Three and consequently did not try seriously to gain markets in other sectors. This culture has stifled entrepreneurship, risk taking, and small business creation not tied to the automobile industry in the region

**Responses and Proposals for Responses:** There have been efforts to devise strategies and responses, some by existing organizations and some by new or restructured ones. The Detroit Regional Chamber of Commerce runs several traditional business attraction and promotion programs, including the Detroit Regional Economic Partnership. It, along with several other economic development organizations and local governments in the region, is also one of the leading promoters of a plan to develop “Aerotropolis,” a major transportation and logistics center encompassing both Detroit’s Metropolitan Airport and the Willow Run Airport in Ypsilanti and the surrounding areas. Detroit Renaissance, a CEO-led organization that had its origins after the Detroit riot in 1967 and focused primarily on the city of Detroit for most of its history, launched

a plan for regional economic development in 2006 (*Road to Renaissance*). However, the organization changed its name in 2009 to Business Leaders for Michigan and directed its concerns completely to the state level with a focus on reducing business costs (particularly taxes) in the state. City and county economic development organizations (such as the Detroit Economic Growth Corporation in the city and similar county-level organizations) continue to perform their traditional functions of promotion and attraction for their own jurisdictions. The most innovative of these is Ann Arbor Spark in Washtenaw County, which serves as the economic development and business attraction organization for Washtenaw County; however, while their goal is locating companies within the county, its leaders noted that they will help businesses locate elsewhere in the region or state if a better location can be found.

Foundations have played an increasing role in the region. The New Economy Initiative for Southeast Michigan, sponsored by the Community Foundation of Detroit, was set up in 2008 to help transition the region to the new economy; it was funded with \$100 million by ten foundations with links to the region, including Ford and Kresge, two foundations that, after having built their fortunes within the region, have, until recently, devoted most of their funding elsewhere. The Kresge Foundation also recently launched a new initiative, Re-Imagining Detroit 2020, in an effort to coordinate the foundation's activities and those of other organizations focused on development in the city; the project has the support of Detroit Mayor Dave Bing and is focused on nine modules – the green economy, entrepreneurial development, urban health care, land-use reform, the Woodward Creative Corridor, mass transit, neighborhood strategies, education, and arts and culture.

Realization that the automobile industry is not going to bounce back as it has in the past has produced a variety of new proposals, some serious and some more fanciful, for regional development alternatives. These include proposals to promote the Detroit region as: an amenity rich region to attract highly educated professionals (since high levels of human capital are now seen as critical to the economic development of the region); a potential wind power and water-resource leader; a region well-placed to produce the next generation of batteries for electric automobiles; a major supplier in the defense production industry through diversification of automobile production technologies and facilities; a major medical center and exporter of health care services building on the presence of several major research hospitals and medical centers and the legacy of expansive health care provided by the automobile industry; and an international



transshipment center given its location on the border with Canada, on major highways utilized by cargo being transported across the NAFTA corridor, and through an airport with direct flights to China and other developing economies. However, virtually all of these concepts are either at the very beginning of the implementation stage or are simply proposals still being developed. Every one of these plans will require long-term commitment and development before they yield visible economic results.

The region's economic development policymakers and practitioners have few overarching goals or strategies that could show immediate effects on the economy, outside of efforts to promote entrepreneurship in the region, most notably through the establishment of TechTown, a small business incubator with a wide variety of services located on the campus Wayne State University. TechTown has a variety of partners and funders, including the New Economy Initiative, the Ewing Marion Kauffman Foundation, and the city of Detroit. Efforts are also underway to encourage collaborative research and commercialization among the three major universities in the region, Wayne State University, The University of Michigan, and Michigan State University.

Many proposals are directed to the problems of the city of Detroit, with a focus on the city rather than the region. Kresge's Re-Imagining Detroit, for example, focuses almost exclusively on the city, which everyone we interviewed agreed is in desperate shape. While the city suffers from population loss, poverty, and crime, the most often noted concern expressed by those we interviewed was the dysfunctional school system. Detroit public schools – kindergarten through high school – are cited as some of the worst in the nation, although many noted that the recent actions taken by Robert Bobb, an emergency financial manager appointed by the Governor for a year and subsequently renewed, were at last beginning to show hope.

At the rhetorical level most (but not all) people that we interviewed emphasized that, while the economic problem is a regional one, it cannot be solved without successfully addressing the severe social, economic, and fiscal problems of the city of Detroit. However, some argue that it is unclear whether improving the condition of the city of Detroit is indeed a precondition for regional economic revival. As one interviewee observed to us, until recently the region was doing very well thanks to the automobile industry even as the city of Detroit declined terribly for decades; it is unknown if this new focus on the importance of the city to the region is a late recognition of the city's role or a matter of "political correctness" and political necessity

that provides actors with political legitimacy to participate in regional interactions that still will not bring the city many benefits.

Clearly, the most important activities related to the region's economic future are being undertaken by the individual Big Three auto industry firms and their suppliers as they struggle to maintain their viability. While some suppliers have made inroads in diversification to meet the needs of related industries (such as defense), these efforts have been limited, especially due to the past rebounds in the auto industry, which drew supplier attention away from needed changes. Other industries, notably health care and higher education, have achieved greater importance, both in their impact on the regional economies and in terms of a conscious effort to affect the region.

**Results:** Currently there are few, if any, tangible effects of the above actions on Detroit's regional economy. Most of those interviewed acknowledged that the current economic situation was the result of the region's long-term dependence on the automobile industry, a period that had brought them unparalleled (though somewhat cyclical) prosperity, but which was now coming to an end. Most also didn't regret the reliance and the benefits it brought, although many did regret the lack of the region's ability to see some time ago that it would inevitably decline. Even the most optimistic felt the effects of any changes will take years to show substantial results.

*Cleveland:*

### **Economic Background and Shocks:**

The Cleveland region refers to the Cleveland-Elyria-Mentor Metropolitan Statistical Area ("Cleveland MSA"), which consists of five counties: Cuyahoga, Geauga, Lake, Lorain and Medina.<sup>45</sup> In 2000, almost two-thirds of the region's 2.1 million population was contained in Cuyahoga County (1.39 million residents, 65 percent), with 478,403 located in the City of Cleveland (22 percent of the region). The Cleveland region was traditionally a manufacturing powerhouse, but between 1980 and 2005, it lost 42.5% of its manufacturing employment base

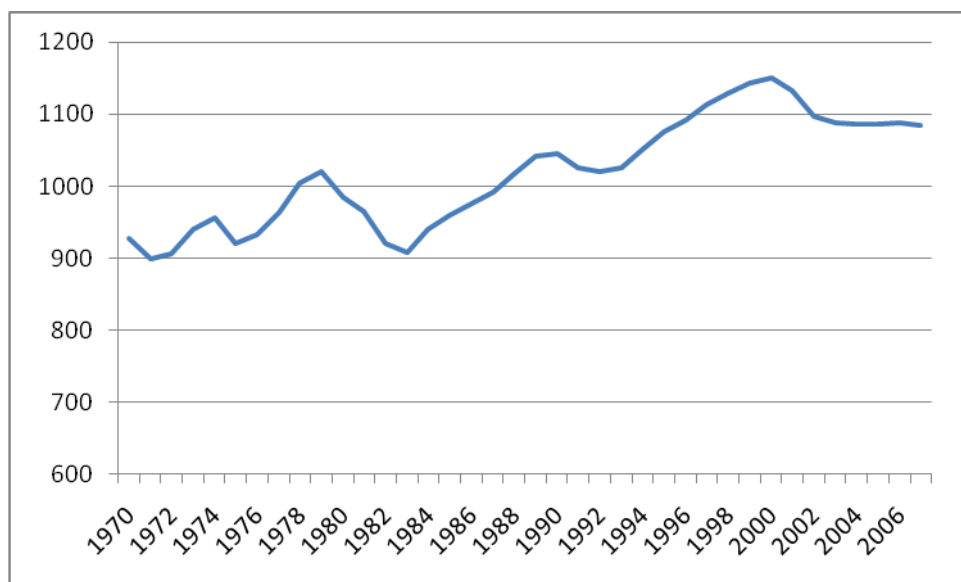
---

<sup>45</sup> Prior to 1993, the Cleveland PMSA consisted of four counties: Cuyahoga, Geauga, Lake, and Medina. In 1993, Lorain and Ashtabula counties were added. Under the 1999 revision, Ashtabula became a Micropolitan Statistical Area and is part of the Cleveland-Akron-Elyria Combined Statistical Area, which also includes the Akron Metropolitan Statistical Area. In this paper, the 2000 MSA definition is used for all data unless otherwise indicated.

(over 110,000 manufacturing jobs). Because its primary industries have been related to automobile and truck manufacturing, Cleveland, like Detroit, is susceptible to regional economic downturns when national downturns occur, because of the negative effect on the consumption and therefore production of motor vehicles. Thus, the Cleveland region experienced downturns during the national recession economic shocks around 1981, 1990, and 2000. It did not experience additional local industry shocks. It lost 98,500 jobs between 1979 and 1982. The 1991 downturn was smaller, with the region losing 24,450 jobs between 1990 and 1992. From 2000-2007, the Cleveland region experienced annual loss in employment, losing a total of 64,000 jobs over the period.

**Regional Economic Resilience/Non-Resilience:** Is the Cleveland region resilient to economic shocks? The similarity to Detroit remains: when the national economy suffered, the region followed, and when the national economy expanded, regional employment increased. The region ultimately was resilient to economic downturns that occurred as a result of shocks in 1979 and 1990. As shown in Figure 2, total employment rebounded after each national recession downturn, increasing to a new peak. Although it took 10 years for the region to regain its 1979 level of employment, by 1983 it had regained its prior growth rate and employment was increasing by 3.7%. The recovery from the 1990 downturn occurred even more quickly. However, the downturn that began as a result of the 2000 shock has been different; the region has yet to recover.

Figure 2. Employment in Cleveland Region, 1970-2007



As Figure 2 suggests, this is a region that has been fighting to remain on a positive trajectory. The eight year average employment growth rate for Cleveland between 1979 and 2006 ranged from -0.85% to 1.85%.<sup>46</sup> And despite its former resilience, the Cleveland region may no longer be winning that fight; employment growth has been negative every year but one since 2000.

**Explaining Resilience/Non-Resilience:** The Cleveland region's resilience to previous shock-induced downturns, like Detroit's, reflects recovery of the national economy. The regional economy is driven by manufacturing, with its strength in producers' durables, making it susceptible to national shocks. It has, however, avoided local industry shocks.

Leaders in the region recognized as early as 1980 the need to engage in economic development to diversify and grow the local economy, hiring both The Rand Corporation and McKinsey & Company to conduct studies on the economy and propose strategies. Numerous studies have been conducted since that time to assess the economy and recommend actions to make Cleveland more competitive. This is a region that understood an economic transition was occurring and it needed to respond. Foundations, corporations, and governments spent significant sums during the last 25 years to address the region's challenges. Despite their efforts, Cleveland has continued to struggle.

An editorial in 1992 stressed the important role of manufacturing to the Cleveland economy: "Manufacturing matters to Cleveland and it is a major reason why it has survived the current recession as well as it has. The recessions of 1979 and 1982 flushed out uncompetitive firms and disciplined labor and, more importantly, management. The result is a highly competitive manufacturing segment, where productivity continues to grow."<sup>47</sup> While this was accurate in 1992, when Cleveland was able to recover from the national downturn of 1991, more

---

<sup>46</sup> It is important to note that the first eight year average employment growth rate in our study, in 1979, was just under 1% for the Cleveland region. By 1979, Cleveland's growth trajectory had already slowed; at no time during our study did it reach 2%.

<sup>47</sup> Hill, Ned. (Winter, 1992) Perspective: Contested Cleveland, *Urban Affairs Association Newsletter*.

recent experiences suggest that Cleveland's inability to restructure its economy to adjust to changes in the national market has left it susceptible to downturns.

**Responses:** The Cleveland region has experience with the "typical" range of responses. It has had both academics and consultants provide analyses and recommendations (Rand 1982, McKinsey 1982, Deloitte 2005). It has created, restructured, and merged economic development organizations. A strong philanthropic community, lead by the Gund Foundation and the Cleveland Foundation, has invested in the community, funding community development, physical redevelopment, research studies, and many other forms of contributions. Despite the steps it has taken, the region continued to experience slow growth which, beginning in 2000, has turned into slow decline in employment with virtually no growth in real gross regional product (2.7% from 2000 to 2007) and in wages per worker (1.3% over the same seven year period).

Two notable sets of responses occurred. The first was in the early 1980s in the wake of the 1979 recession with the election of George Voinovich as Mayor, the formation of Cleveland Tomorrow by the CEOs of the 50 largest Cleveland businesses, the funding of studies conducted by Rand and McKinsey on the Cleveland economy, and projects resulting from these activities.

The second major phase occurred in the early 2000s as the foundation community in the broad region that stretches across 17 counties began coordinating their resources and focusing on a regional approach while the business organizations in the city itself consolidated to remove duplication, improve coordination, and lower their combined operating costs in the face of having to create a renewed set of development intermediaries narrow their agenda.

Cleveland Tomorrow was a group of fifty CEOs formed in 1981 to focus on jobs and economic vitality after recognizing the region's employment growth was slow and its poor performance was chronic, persisting through business cycles.<sup>48</sup> The initiatives that Cleveland Tomorrow supported included the following:

- Work in Northeast Ohio Council (WINOC), an independent labor-management organization established in 1981 that promoted productivity programs and quality of work life programs in manufacturing industries.

---

<sup>48</sup> The Cleveland Tomorrow Committee (Dec 1981). *Cleveland Tomorrow – A Strategy for Economic Vitality*. Cleveland: Author.

- Cleveland Advanced Manufacturing Program (CAMP), a partnership among the State government, Cleveland Tomorrow, and local universities and the community college to expand research and services to promote advanced manufacturing, beginning in 1984.
- A Center for Venture Development created and funded with grants from the Cleveland and Gund Foundations and the Greater Cleveland Growth Association to assist entrepreneurs with business plans, build their boards, identify professional services and find funding.
- Primus Capital Fund, seeded in 1984 with \$30 million from Cleveland Tomorrow companies and the Ohio Public Pension Fund to provide a ready source of venture capital.
- NorTech, established in 1999 to coordinate development activities across the region's highest potential technology sectors: bioscience and health care, information technology, electronics, polymers and advanced materials, and power and propulsion
- Neighborhood Progress Inc. (NPI), started with \$200,000 from Cleveland Tomorrow in 1988 to conduct neighborhood development work, it provides operation support and technical assistance to organizations.

While Cleveland Tomorrow has been identified as an “effective” and “impactful” organization in interviews, it was unable by itself to put the Cleveland region on a sustained growth path or to avoid the major downturn in the regional economy that began in 2000 and has continued since. While the impact of Cleveland Tomorrow on the regional economy is difficult to assess, it is clear that it became less effective over time. Many of the founding CEOs were with companies that had been acquired and/or moved. The CEOs had more demands on their time and more traveling, decreasing the personal connections among them and less time to devote to civic causes. The leaders had less autonomy over corporate money as their firms became branches of larger firms. As the CEOs of the large companies became less available, smaller firms were becoming more important in the economy and non-profit organizations, particularly the universities and hospitals, also were becoming more important to both the economy and to civic leadership.

Partly as a response to the sustained downturn after 2000, Cleveland Tomorrow, the Greater Cleveland Growth Association and the Greater Cleveland Roundtable merged in 2004, to

form the Greater Cleveland Partnership (GCP). Compared to Cleveland Tomorrow, which consisted of 50 CEOs from the largest companies, GCP's 60 board members included 26 members from large firms, 14 from small firms, 3 from mid-sized firms, 8 from professional services, 3 from higher education (Case Western, Cleveland State University, Cuyahoga Community College), and 6 others. The new organization recognizes the growing role of non-profit institutions as well as banks and law firms. One person explained that the main "go to" people used to be the utilities and manufacturers, but are now the banks. It is in developing and implementing its agenda that one will see if this more inclusive organization and these new leaders can help the Cleveland region as it continues to respond to its manufacturing decline. As one of the Board Members explained, "The goal of the merger was to use savings from removing duplication to expand economic development activities."

The Greater Cleveland Partnership decided to adopt a focused, holistic economic development strategy. It supports five intermediary development organizations that now work on the broad regional scale; a scale that includes the Cleveland, Akron, and Youngstown metropolitan areas and large rural areas of the Northeastern corner of the state of Ohio. Two of these intermediaries continue from the original set established by Cleveland Tomorrow: NorTech and MAGNET. BioEnterprise grew out of a NorTech initiative around bioscience. TeamNEo is a regional economic development attraction organization that works in conjunction with the regional chambers of commerce and local economic development professionals. TeamNeo grew out of large corporate CEO dissatisfaction with the complexity and density of economic development organizations.

Foundations have always played an important role in the Cleveland area, but that role has increased markedly in the economic development arena during the past decade. The two primary foundations in the region are the Cleveland Foundation and the Gund Foundation. These two foundations have supported economic development by funding research, supporting initiatives introduced by Cleveland Tomorrow, and participating in other regional projects. For example, the Gund Foundation funded the Cleveland Tomorrow Committee and McKinsey study in 1980, while the Cleveland Foundation funded the Rand study in 1980 to develop regional economic indicators and evaluate economic development opportunities for the Cleveland region. After many years of struggling to make a difference in economic development in the region, often supporting bricks and mortar projects as well as various business-led initiatives, the Cleveland

and Gund Foundations, together with the GAR Foundation of Akron, were instrumental in creating collaboration among philanthropic organizations in Northeast Ohio: the Fund for Our Economic Future.

Formed in 2004, this collaboration of 70 private and corporate foundations in 16 Northeastern Ohio counties, adopted a larger regional focus, incorporating all of Northeast Ohio rather than solely the Cleveland region. The Fund's goal is to frame a regional economic development agenda "that can lead to long-term economic transformation," track overall regional progress, and financially support highly promising initiatives. It enables the philanthropic community to provide a more focused presence. It brings more foundation players to the table and gets them to agree on a common strategy. The Fund follows a strategy similar to Cleveland Tomorrow by using its resources to fund intermediary organizations. As mentioned above, many of the organizations it funds are entities that grew out of Cleveland Tomorrow's initial six programs.

Five organizations are supported by both the Greater Cleveland Partnership and Fund for Our Economic Future: Team NEO, NorTech, JumpStart, MAGNET, and BioEnterprise. The most important departure from previous efforts is a determined concentration on a regional approach and the creation of a set of intermediaries each with a fairly narrow focus and a commitment to performance measurement. *Team NEO* was formed in 2003 to market the greater Northeast Ohio region and attract firms. While it initially included retention strategies, these were eliminated to allow the organization to focus on attraction. By having one regional entity to bring together the relevant parties for attraction, Team Neo was created to address a prior complaint, one interviewee explained.

*NorTech* is the successor organization to the Technology Leadership Council, established in 1988 by Cleveland Tomorrow. It was created to promote initiatives in biotech, polymers, electronics, advanced materials and other emerging industries. This was the first initiative branching away from durable goods manufacturing. In 1999, the Council became NorTech and began developing a more regional agenda. NorTech supported the creation of BioEnterprise, facilitated the formation of the Ohio Polymer Strategy Council, and was a founding member of the Ohio Technology Partnership. The focus on this set of programs is to substantially increase entrepreneurial support and outcomes *within* and, especially, *at the intersections* of Northeast Ohio's technological strengths in Biosciences and Healthcare, Polymers, Advanced Materials



and Manufacturing, Electronics, Information and Communication Technology (ICT) and Advanced Energy. Nor Tech focuses on investing in a “tapestry” of industries, rather than deciding among them. As it was explained to us, the region doesn’t “need an either/or strategy between manufacturing and services.”

*JumpStart, Inc.* was formed in 2002 to stimulate early-stage business development and investment by providing capital, technical and management support to new and promising enterprises. It has three primary tasks: to connect entrepreneurs with success of stakeholders, provide technical assistance, and assist with venture development. The programs provided by JumpStart are designed to address some of the challenges to entrepreneurship. For example, an innovator who has worked at big company may not have personal connections and not know how to capitalize a project.

*MAGNET*, the Manufacturing Advocacy and Growth Network (formerly known as the Cleveland Advanced Manufacturing Program, which was established in 1984 under the Edison program), assists manufacturing-dependent industries by providing assistance on quality and innovation. It provides manufacturing process and productivity improvement services, product design and development services, and fee for service training. It also brokers commercial and university intellectual property in selected manufacturing areas and delivers Federal/State Manufacturing Small Business Assistance programs.

*BioEnterprise* (BioE), created in 2002, provides management counsel, clinical access, business development, and capital access services to newly forming bioscience companies, with the aim of accelerating their growth. It was a joint initiative of The Cleveland Clinic, University Hospitals Health System, Case Western Reserve University, and Summa Health System, which jointly committed to raising a half billion dollars to support new ventures in the biosciences, and by 2005 had raised more than half of the necessary funds and had created, recruited, and accelerated expansion of more than 40 companies. As with the JumpStart and TeamNeo, Bio E was the outgrowth of a McKinsey and company report which recommended that the entity be a catalyst for healthcare community and proposed two primary strategies: focus on small private companies that need funding to grow and promote broader healthcare initiatives across the region. This included supporting research institutes, attracting larger companies, helping companies expand, addressing workforce development, and advocating for changes in state policy.

**Results:** The Cleveland region has reorganized its economic development institutions, focused on the region, and undertaken a series of initiatives described above that can be considered at the forefront of current economic development strategy and thinking. It is impossible to determine how effective the region's activities have been. The region's economy continues to stagnate, but it may be that without these activities the regional economy would have been much worse or it may be that these activities are laying the groundwork for future growth. It's also possible that even the best current thinking on regional economic development is inadequate to cope with the problems of a region that is undergoing the kind of externally forced economic transformation Cleveland is now undergoing.

One area of concern is an incipient split in the Fund for Our Region's Economic Future. The Cleveland Foundation was the largest investor in the Fund and supported the broad regional effort through two rounds of funding. In 2009 it largely pulled out of the Fund in a very public manner. A stated reason for the Cleveland Foundation's withdrawal was the Fund's insistence on regional funding approaches and the Foundation's desire to be more directly active in investing in development activities in the City of Cleveland and a desire to support development activities that are responsive to strategies developed by its leadership and board. The Cleveland Foundation has made a direct grant to TeamNeo to expand its attraction activities in Europe and it has been active in internationalizing the city of Cleveland's international economic development profile.

*Charlotte:*

**Economic Background and Shocks:** The face of the Charlotte region's economy during much of the 20<sup>th</sup> century was manufacturing, comprising about one-third of the region's jobs in 1980. Textile mills, textile product manufacturing, and apparel manufacturing accounted for more than half of those manufacturing jobs and a seventh of jobs overall as late as 1980. However, global competition began to erode the profitability of the domestic textile and apparel industry. Between 1980-2005, those three industries lost 49,800 jobs, a decline of 82% from their 1980 level. More of this decline occurred in the period from 1995 to 2005, where 2005 showed a 70% decline from 1995.

At the same time, the Charlotte region's economy was transitioning into a financial hub, taking advantage of the arrival of banking deregulation to become the second largest financial center in the nation. Bank mergers allowed the region to prosper even as employment in its formerly prosperous textile mills, textile product manufacturing, and apparel manufacturing subsectors declined at a precipitous rate. By 2005, regional employment in manufacturing in general had declined over the quarter century from one-third to one-tenth of the regional labor force<sup>49</sup>, while finance and insurance had doubled (from 3.66% to 7.40%).

The Charlotte region<sup>50</sup> experienced four shocks over the period we examined. Three of these included national economic downturn shocks in 1981, 1990, and 2000-2002, each of which resulted in a regional downturn in the Charlotte economy. In each case, Charlotte never lost more than 1.3% of employment (5,000 jobs, 7,000 jobs, and 1,000 jobs, respectively) and the region proved resilient to the shock within three years. The other shock, to which the region was resistant, was an industry shock that occurred in 1984 as a result of transformations occurring in the textiles and apparel manufacturing. The textile mills industry also had an industry shock in 1981, but that one was piggybacked to the national economic downturn shock.

The decline in total manufacturing employment resulted primarily from the decline of employment in the textile mills, textile product manufacturing, and apparel manufacturing; these subsectors lost respectively total of 49,000 jobs, between 1980 and 2005. Textile and apparel manufacturers, unable to integrate advanced machinery and move into higher value-added product lines, struggled to keep their firms afloat; many did not survive.<sup>51</sup> Some manufacturing sectors have had major gains, however. Three manufacturing subsectors, each with at least 6,000 employees in 2005, saw increases in employees of 50% or more during 1980-2005. These included plastics and rubber products (58.62%), fabricated metal products (61.73%), and transportation equipment (94.86%).

However, the Charlotte metropolitan area was transitioning into a financial center with employment in banking and finance (credit intermediation and its related activities) increasing during 1980-2005 by 287%, growing from 9,000 to 35,000 employed. The most recent national

---

<sup>49</sup> Some manufacturing firms have replaced a segment of their permanent manufacturing positions with temps in order to better handle shifts in demand, suggesting that the decline of employment within manufacturing may not be as drastic as it appears.

<sup>50</sup> The Charlotte Metropolitan Statistical Area includes York County in South Carolina and five counties in North Carolina – Anson, Cabarrus, Gaston, Mecklenburg, and Union.

<sup>52</sup> Bureau of Labor Statistics, Databases, Tables & Calculators by Subject, Series IDs SMU3716740000000001 and SMU3716740000000001, [http://www.bls.gov/eag/eag.nc\\_charlotte\\_msa.htm](http://www.bls.gov/eag/eag.nc_charlotte_msa.htm) Accessed 4/30/2010.

recessionary period, beginning in the late 2000s, has resulted in the collapse of large financial corporations nationally, and the dependence of the Charlotte region's economy on financial institutions has made it especially vulnerable to this current recession. The Bureau of Labor Statistics shows a decline of for the region over 2005-2009, depending upon sources.<sup>52</sup>

Wachovia, an iconic banking presence in the region, as is hometown financial rival Bank of America, was taken over by San Francisco-based Wells Fargo, completed in December 2008. In its acquisition of Golden West Financial in 2006, Wachovia took on mortgages that proved troubling, and these partially led to its merger with Wells Fargo in 2008. Bank of America acquired Merrill Lynch in the fall of 2008; then acquired billions in capital from the U.S. government to stay afloat.

Both Wells Fargo and Bank of America used layoffs to shed duplication created by their acquisitions. While top executives with Wachovia have departed, Wells Fargo established Charlotte as its east coast banking headquarters. Bank of America pulled together scattered staff in the New York City area, including some it acquired in the wake of the Merrill Lynch merger, in investment, in equities trading, among others, into its new office tower, but any impact on Charlotte has not been noted.<sup>53</sup>

The cumulative effects of the financial upheavals are showing in employment losses. Jobs in credit intermediation, of which the mortgage subsector is a part, peaked in 2006 and have dropped annually since (including continued drops quarterly in 2009), reflecting the retrenchment in Wachovia's mortgage unit from the impact of its subprime mortgage losses. The mortgage jobs themselves have also declined from their high in 2006. Employment in commercial banking has declined by approximately 2,500 from a peak in 2007. Administrative and support services peaked in 2008, falling off significantly in jobs in 2009.<sup>54</sup>

Financial institutions in the region, long-known for their generous compensation to employees, reduced payrolls and bonuses. Average earnings in the finance and insurance sector escalated from \$88,000 in 2005; to \$97,000 in 2006; to \$101,000 in 2007; before dropping to

---

<sup>52</sup>Bureau of Labor Statistics, Databases, Tables & Calculators by Subject, Series IDs SMU3716740000000001 and SMU3716740000000001, [http://www.bls.gov/eag/eag.nc\\_charlotte\\_msa.htm](http://www.bls.gov/eag/eag.nc_charlotte_msa.htm) Accessed 4/30/2010.

<sup>53</sup> Rothacker, Rick, "Big changes, tough times in Charlotte," *The Charlotte Observer*, Monday, Sep. 14, 2009, <http://www.charlotteobserver.com/2009/09/14/910100/big-changes-tough-times-in-charlotte.html> Accessed 4/30/2010.

<sup>54</sup> Data in this paragraph are from Employment Security Commission of North Carolina, Industry Information: Employment and Wages by Industry, 1990 to Most Recent, <http://www.ncesc1.com/lmi/industry/industryMain-NEW.asp> Accessed 4/30/2010.

\$96,000 in 2008. In the boom of 2005, annual finance and insurance wages were 15% of the region's wages yet 7.5% of the jobs, and 16% of the wages to 7.75% of the jobs in 2006. That ratio has eroded to a third quarter 2009 standing of 12.5% of wages to 7% of jobs.<sup>55</sup> Salary retrenchment in the financial sector inevitably has recessionary effects upon the regional economy.

**Regional Economic Resilience/Non-Resilience:** Between 1978 and 2007, the Charlotte region was resilient in the face of three national economic downturns. The region's downturns track national economic downturns and its recoveries track national upturns. The region also experienced one industry shock apart from, and a second in conjunction with, a national economic downturn. The regional economy's resilience is due in large part to its shift from manufacturing to tradable services-providing industries – particularly the finance and insurance sector and the three sectors comprising the business and professional services supersector. These sectors profitably financed a recovering national economy, insulating the region's economy from recession. The region was resilient to shock-induced downturns that occurred in 1981, 1990, and 2000-2002. Leading into the 1981 national economic downturn, the region's prior average eight year employment growth rate was 3.1%. Between 1981 and 1982, employment declined by 1.3%, but by 1983 the economy was growing again at an annual rate of 7.44%. The region's annual growth rate did not turn negative again until the 1990-1991 national economic downturn, when employment declined by 1.2% before rebounding to 4.3% two years later. Employment was essentially flat between 2000 and 2002. In 2005, growth had returned to a healthy 4.4%.

**Explaining Resilience/Non-Resilience:** The explosive growth of the Charlotte region's banks was the region's new economic engine, replacing manufacturing. The banks, with early experience in intrastate banking giving them a competitive advantage, rapidly expanded nationally, prospered on the strength of the nation's recovery from the early 1980s recession, and propelled the Charlotte MSA into unprecedented growth.

The transformation from an economy based on relatively low-skilled textile mills work, textile manufacturing, and apparel manufacturing to finance and insurance as the driver of the

---

<sup>55</sup> Data in this paragraph are from Employment Security Commission of North Carolina, Industry Information: Employment and Wages by Industry, 1990 to Most Recent, <http://www.ncesc1.com/lmi/industry/industryMain-NEW.asp> Accessed 4/30/2010.

regional economy was not a result of conscious policy or planning by the public sector or by civic alliances. Rather, there were two interacting factors that account for Charlotte's rise in banking and finance: favorable state laws and two entrepreneurial banking CEOs who were able to take advantage of them.

Branch banking had historically not been allowed in most U.S. states; fear of monopoly by the large northeastern banks led most states to prohibit branching, with the result that by 1910, only 12 states permitted it.<sup>56</sup> Given the legal authority by their state legislature to branch statewide, North Carolina banks learned how to acquire other banks, merge their operations, and run the merged bank as a branch facility, exhibiting expansion-minded behavior as early as the 1950s. The North Carolina National Bank (NCNB) pushed for expansion into international finance in the early 1970s before most regional banks saw the opportunities abroad. In 1980, NCNB used a task force to explore ways to expand beyond state lines, even before the Supreme Court ruled that interstate banking compacts were permitted. In 1982, NCNB led banking across state lines, fully two years ahead of any competitors. Four southern states' legislatures, including North Carolina's, passed similar permissive regional reciprocal banking bills, the most uniform to that date in 1984, providing a common market in a Southeastern compact which other southern states would gradually join. This long practice with handling multiple branches statewide and the Southeastern compact's protection of interstate expansion within the compact without fear of acquisition<sup>57</sup> gave North Carolina banks, and some other southern states' banks, an advantage when interstate banking was declared constitutional by the US Supreme Court in 1985.<sup>58</sup> Though it would be nearly a decade before Congress passed the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994, repealing restrictions on interstate banking, banks were allowed to service large borrowers through loan offices outside of their state and conduct nationwide advertising for deposit customers.<sup>59</sup>

While the state laws permitting branch banking provided the opportunity for expansion of Charlotte's financial sector, it was two visionary figures, Hugh McColl and Edward Crutchfield, who seized the opportunity and took advantage of it. McColl was named CEO of North Carolina

---

<sup>56</sup> Emmanuel N. Roussakis, *Commercial Banking in an Era of Deregulation*, p. 43.

<sup>57</sup> Frieder, Larry A., "The Interstate Banking Landscape: Legislative Policies and Rationale," *Contemporary Economic Policy*, Vol. 6, No. 2, p. 58.

<sup>58</sup> **Northeast Bancorp Inc v. Board of Governors of Federal Reserve System**

<sup>59</sup> Bernstein, Mark. W. "Banking Law: Developments in Interstate Banking. *Annual Survey of American Law* 113 (1985)

National Bank (NCNB) in 1983. Crutchfield became CEO of First Union Bank in 1985. Both McColl and Crutchfield pursued an aggressive strategy of consolidation, buying banks in large and fast-growing markets such as Florida, Texas, and Georgia. More conservative banks that did not follow a similar growth strategy were acquired or began to disappear.<sup>60</sup>

As the banking sector grew, we were told that McColl, Crutchfield and other leaders in the financial sector feared that Charlotte's lack of amenities and downtown presence might serve as a constraint on the sector's expansion. They believed that attraction of financial talent to Charlotte required them to make Charlotte and its downtown a viable place for their employees to move and to work and that this required cooperation with the city, particularly in efforts to redevelop the downtown. Thus, even as they began their aggressive bank expansion strategies beginning in the mid-1980s, McColl and Crutchfield, along with Bill Lee, the head of Duke Power (a regional energy company), pushed a downtown development strategy, using their relationships with city officials to forge public-private partnerships and a division of labor whereby the city government handled infrastructure such as street lighting and parks, or crime-prevention, through projects such as City Within the City, while the private sector assumed a role in amenities-building, housing provision, commercial construction, and marketing.

The city civic elite and city and county governments were business-friendly and willing to work to accomplish a better downtown. One government employee observed, "When the county commission and city council want something, then they make calls to the business community and ask them, 'Can you get this done?'" When citizens voted down a bond issue that bundled funding for arts and sports initiatives, the private sector leadership from the two banks and power company simply built it, putting together \$100 million in interest-free financing, and local officials added a hotel and motel tax to push the deal through.

From all accounts, the public and private sectors in Charlotte worked remarkably well-together over this period, a phenomenon that was no doubt aided by Charlotte's perception of itself as a business-focused community. This public-private alliance with no open display of friction reduced transaction costs, including lost time, waste of political capital, and public ill-will. The corporate elite in the Charlotte region saw themselves as part of a community and had a high degree of social cohesion. McColl, Crutchfield, and Lee were all native Southerners. To

---

<sup>60</sup> Dan Fitzpatrick, "Charlotte Reveling in its Role as a Giant; How it Outpaced Pittsburgh Banks," *Pittsburgh Post-Gazette*, June 25, 2006, p. A-1.

the extent that they shared similar values, it at least partially explains the commitment and shared vision of the business elite who conceptualized and drove much of Charlotte's growth. The explanation was that "it was the perfect blend of strategy and execution." While the comment, "Charlotte was lucky, it had very visionary leadership who put the region's growth ahead of their own purposes," passes over the profits to be made by the three men's companies that could grow upon the growth of the Charlotte region, nonetheless there were many actions that reflected a collective sense of stewardship.

As the community reinvented the Charlotte region as an attractive location, banking talent from outside of the region began to settle in Charlotte. Many of the region's new, more highly educated residents were recruited by the financial sector from outside the state, individuals who were attracted by well-paying jobs in finance and related fields as well as the increasing number of amenities offered by the downtown. This in-migration enabled the financial industry to overcome an education system that may have otherwise prevented the banking sector from obtaining the number and level of educated workers that it required.

The current Great Recession is going to test whether the qualities said by residents to underpin the region's resilience – social networking, hard-work, risk-reduction behavior, problem-solving mentality, stewardship, and a positive approach – will contribute to resiliency.

**Responses and Proposals for Responses:** The public sector's response to massive losses in textile employment was simply not to respond. In the 1980s, as the regional economy's small textile and apparel firms diminished, there were no deliberate public policies to confront this economic loss, such as reports or agendas for programs to help larger textile and apparel firms shore up core competencies or strengthen their supply chains.<sup>61</sup> Some officials acknowledged being taken off guard by the sudden unwinding of the textile and apparel industry, but in any case there was probably little that could have been done to preserve the sector in the face of international competition at lower wage levels.

Subsequently, as the textile mills, textile product manufacturing, and apparel manufacturing subsectors waned, manufacturing overall in the region also experienced retrenchment. Employees of major manufacturing firms pointed to a lack of advocacy in public

---

<sup>61</sup> Patrick Conway, Robert Connolly, Alfred Field and Douglas Longman, "The North Carolina Textiles Project: An Initial Report," *Journal of Textile and Apparel, Technology and Management*, Vol. 3, Issue 3, Fall 2003. [http://www.unc.edu/~pconway/Textiles/nctp\\_tatm\\_rev.pdf](http://www.unc.edu/~pconway/Textiles/nctp_tatm_rev.pdf) Accessed April 19, 2009.



policy and a dearth of research and development resources. The response of manufacturers was further hindered by the lack of a skilled and highly educated labor force in the surrounding area. Unlike the banks, manufacturers could not import skilled workers from elsewhere on a large scale.

In 1991 McColl, Crutchfield, Lee, Stuart Dickson (Ruddick Corporation), and John Belk (Belk department stores) formed the Charlotte Regional Partnership, a public/private organization devoted to attracting business and investment to the 16 counties in the broader Charlotte region (including some not a part of the strictly defined metropolitan area), with a particular focus on attraction of foreign firms.

Other civic organizations dedicated to improving the area's economy and business climate, including the Charlotte Chamber of Commerce, which served the City and Mecklenburg County. It campaigned on bond sales, advocated for the business community, and focused on attraction and retention of businesses with such programs as its 2006 initiative called Business First. In 1998, the Charlotte Chamber initiated the Advantage Carolina project as a strategic planning arm of the Chamber. 17 key initiatives would grow out of the project, including the Information Technology Collaborative, the Workforce Development Continuum, and Pathways to Employment. Central Piedmont Community College (CPCC) managed Pathways to Employment – a three-month welfare-to-work program that prepared welfare recipients to enter the workforce in five areas identified based on community workforce needs. Most participants received Temporary Aid for Needy Families (TANF). McColl led the Chamber's efforts to hire the TANF participants, and 76% of chamber members participated.

The civic elite did recognize the importance of having a research university to a vital economy and Charlotte's lack of one. In 1989, Charlotte was the largest metropolitan area without a doctoral-granting university. With help from McColl and Crutchfield, university officials started a capital campaign to fund the offering of doctoral degrees which was successful, such that, by 2005, UNC Charlotte was classified as a research-intensive institution by Carnegie Foundation, joining the state's N.C. State and UNC-Chapel Hill on the list.

The motorsports industry has expanded in the region. A united governmental effort for placement of the NASCAR Hall of Fame in the region successfully attracted the museum which opened in 2010. The Charlotte Motor Speedway coordinated with area jurisdictions to establish a garage tour of the race cup teams headquartered in the region, and the Speed Channel's

headquarters, originally in Chicago under a different name, expanded in Charlotte in 2008, assisted by the state's One North Carolina Fund. Motorsports now employ 27,000. Three manufacturing subsectors, each with at least 6,000 employees in 2005, saw increases in employees of 50% or more during 1980-2005. These included plastics and rubber products, fabricated metal products, and transportation equipment; each plays a role in motorsports. Three supersectors had at least one-tenth of the region's jobs in 2005, manufacturing was one of them.

Overall, however, there were no deliberate public sector economic development strategies or public policy decisions that explain the region's phenomenal growth. Rather there is an attitude within the governmental sector, itself taking pride in its business-like demeanor, that "the business of Charlotte is business." In 1993, the city government reorganized itself to take on a more pronounced business mind set.<sup>62</sup> The governmental sector operates as an enabler to the requirements of the business community to thrive in the Charlotte region.

The recent takeover by Wells Fargo of Wachovia opens a new financial chapter for the region, where homegrown talent and homegrown philosophy could hold less sway. We were told, however, that Wells Fargo – unlike Wachovia – has a decentralized management style that maintains more local management. Now that Charlotte employees have become the "local" employees of a distant corporate owner, the philosophy could work to reduce the impact of the new ownership by outsiders.

Lesser financial institutions, including GMAC Financial, are picking up some of the newly unemployed financial talent pool. The Chamber of Commerce, desiring to show that the region was still open for business, mailed a pitch signed by McColl to several thousand financial institutions. Former First Union Corporation and Bank of America Corporation executives have filed paperwork to establish a new bank in Charlotte, looking to benefit from purchase of problem banks.<sup>63</sup>

**Results:** This private-sector-led trajectory worked swimmingly for 25 years, and the Charlotte region nearly doubled its employment during the time span from 408,000 to 801,000 jobs. There is almost universal agreement that the area is business-friendly. While a business-friendly

---

<sup>62</sup> City of Charlotte, "The Charlotte Story: Public Service is our Business," April 2000, p. 13.

<sup>63</sup> Rothacker, Rick, "Former First Union, Bank of America execs organizing new bank," *The Charlotte Observer*, Monday, April 26, 2010, <http://www.charlotteobserver.com/2010/04/26/1399577/former-first-union-bank-of-america.html> Accessed 4/30/2010.

attitude invites business, it provides no direct link back to public policy efforts at economic development. Public efforts in the community colleges and the technical colleges have been focused on training for lower-end service positions, and made some impact, but did not address the higher end positions. With the private sector putting its own funds into job training, and recruiting many of its employees from elsewhere, there was little incentive for the public sector to respond to training of higher-paying jobs.

Charlotte's resiliency is thus a product of the strategy and fortunes of its major private sector firms and the entrepreneurs who have lead them. Its "resiliency strategy" is ultimately dependent upon two very large banking firms and the power company, and these firms are now facing very difficult and different environments. Duke Power, one of the triumvirate, and the one that maintained the lowest profile during the growth years, is emerging out of the recession as a major national and international policy leader in green energy and in nuclear power. Duke Power under Lee's guidance established the World Association of Nuclear Operators and the company has a major role in Carolinas Nuclear Cluster Group. It may be emerging as the face of the new Charlotte region.

However, the financial crisis has created retrenchment and uncertainty in the banking and finance sectors. Numerous times the words heard were that "This is nothing like we have ever seen before. These jobs are not coming back." Observers believe that the "new normal" that the region returns to will no longer exhibit unprecedented growth. How resilient those banking firms prove to be in the face of the Great Recession, how well the current economic diversification efforts proceed, and whether the qualities said by residents to underpin the region's economic bounce still come into play – all of these factors will tell the future of the Charlotte region's resiliency in this go-round.

### *Grand Forks*

#### **Economic Background and Shocks:**

Grand Forks is a small region<sup>64</sup> that encompasses portions of two states (North Dakota and Minnesota) and has a population of slightly less than 100,000, of which slightly more than 67%

---

<sup>64</sup> The Grand Forks region is defined in this paper as the Grand Forks metropolitan statistical area (MSA). The MSA consists of Grand Forks County, ND, containing the city of Grand Forks, and Polk County, MN, containing

is on the North Dakota side. The region has historically been an agricultural economy, with major crops of wheat (largest crop by acreage), sugar beets (largest cash crop), potatoes, and soybeans. Other large employment sectors are the military, specifically Grand Forks Air Force Base (GFAFB), established in 1955, and State Government, which includes the University of North Dakota and the State-owned mill and elevator. In 1980, the region's economic drivers were military (location quotient of 5.7 in 1980, 14.5 percent of the region's employment), state government (LQ 3.4, 13 percent employment), and agriculture<sup>65</sup> (LQ 2.9, 12 percent employment). No other industry had a location quotient of 2 or greater. The region is thus susceptible to shocks resulting from decisions at the national level (e.g., military base reductions) and the state level (government reductions), as well as nature (weather, pests, and other elements that affect agricultural production). This provides economic diversification, but gives the local region few levers to respond to economic shocks.

The Grand Forks region experienced a large number of shocks during our period of study. These included local industry shocks in 1978, 1980, 1985, and 1996, national industry shocks in 1983 and 1989, and a national economic downturn shock in 2000. Nearly all of the industry shocks involved shocks to its military employment sector. It was shock-resistant to the 1978, 1983, 1985, and 2000 shocks, but it experienced economic downturns as a result of shocks in 1980, 1989, and 1996. The region was resilient to the first one of these downturns, but not to the second two.

The 1980 shock-induced downturn appears to primarily have been the result of the national recession rather than local events. Thus, when the nation rebounded, so did the Grand Forks region. In 1989/90, however, the region suffered a one year loss of 7 percent of its military employment (likely a result of the inactivation of some missile wing units), followed by a 4 percent employment loss in State government in 1991. The region was not resistant to these shocks. The 1996 downturn involved an additional 7 percent decrease in military employment (1500 employees), this time the result of the 1995 BRAC. Contributing to this downturn was the flood in April 1997, which damaged 83% of homes and 62% of commercial units in the city of Grand Forks and all but 8 homes in East Grand Forks, resulting in almost \$2B of damage in the

---

the city of East Grand Forks, with the Red River dividing the states. North Dakota is the larger portion, with Grand Forks County containing a 2000 population of 66,109, of which 49,231 was in the city of Grand Forks, while Polk County had a 2000 population of 31,369, of which 7500 were in East Grand Forks.

<sup>65</sup> Agriculture is measured using the two-digit NAICS code, while other industries are measured at the three-digit level.

greater Grand Forks area. The agricultural industry suffered distress, presumably related to the flood, particularly with the spring wheat crop.<sup>66</sup> In 1997 alone, the region's employment fell by 2 percent, the region's largest decrease in our study period, as shown on Figure 3.

### **Regional Economic Resilience/Non-Resilience:**

Grand Forks differs from the other regions in this project because it is not the primary city in the state, and it has a small economy, with a metropolitan population of less than 100,000, regional employment below 60,000 and a GMP of \$3.6M. "Downturns" in Grand Forks reflect, for example, a 2 percent employment decline, which means 1200 people losing their jobs. A second difference is that while Grand Forks experienced a decline in its annual growth rate of employment in 891989, its employment continued to increase after that until the greater downturn of 1996 occurred.<sup>67</sup> At that point, it experienced a fast flash rather than a "slow burn."<sup>68</sup> Finally, Grand Forks was selected for the case study to provide insight into shocks other than the three types we have defined and operationalized – national economic downturn shocks, national industry shocks, and local industry shocks. In Grand Forks the shocks were military base closings brought about by BRAC followed by a major national disaster (the 1997 flood). Is the Grand Forks region resilient to economic shock-induced downturns? The data indicate that while it was resilient to the 1981 recession, it otherwise has not been resilient, at least by our definition of resiliency. Prior to the 1980 shock, the Grand Fork region's average eight year employment growth rate was 1.55%. While the annual growth rate fell to -1% in 1980, it rebounded to its prior level within two years. However, the region was, by our definition, not resilient to the downturn caused by the 1989 shock; it did not return to its prior growth rate within a four year period. Nonetheless, employment continued to increase every year for the next six years – until the year of the flood and base reduction. Prior to the 1996 downturn, the Grand

---

<sup>66</sup> Another factor mentioned by some interviewees was reduced retail sales from the rise of the US dollar in relation to the Canadian dollar. The US dollar which had an exchange rate of 1.17 Canadian dollars in 1990, strengthened to 1.36 CAD in 1996, 1.38 in 1997 and 1.48 in 1998. In 2008, the exchange rate was 1.07. (<http://www.oanda.com/currency/historical-rates>, average annual interbank rates). According to one interviewee, once the exchange rate exceeds 1.33, the Canadians "quit coming."

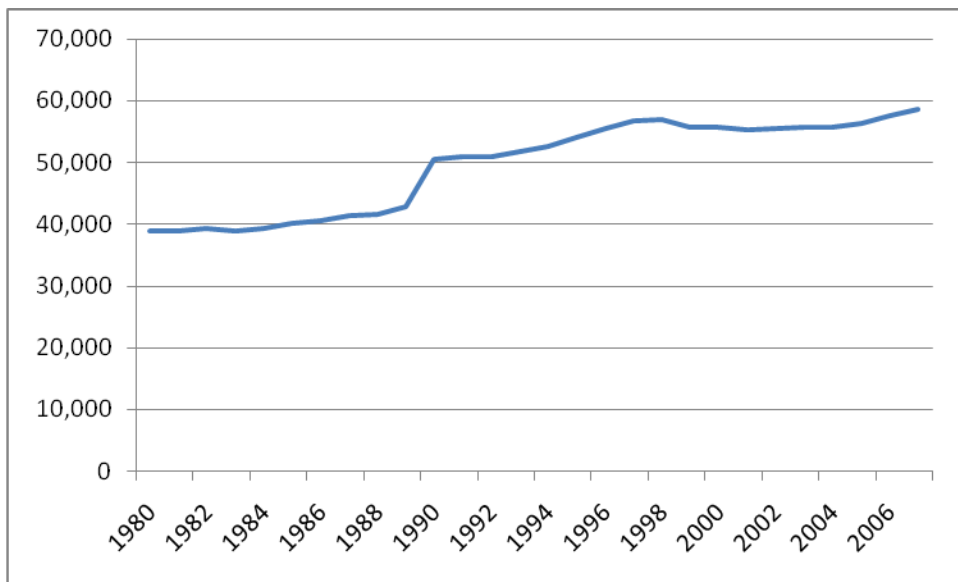
<sup>67</sup> The GMP supports this view. Grand Forks recovered quickly from GMP downturns in 1988 and 1993, rebounding within a year. However, it was not resilient to the shock in 1997, when GMP fell from \$3.4M to \$3.1M, then continued to fall, dropping to \$2.9M in 1999.

<sup>68</sup> Pendall, Foster, and Cowell. 2009.

Fork region's prior average eight year employment growth rate was 1.77%. In 1996, the annual growth rate fell to -2.2%, remaining negative or under 1 percent until 2002, when the annual employment growth rate was 1.3%. From 2002-2006 the average annual employment growth rate was 1.5%. In short, the Grand Forks region seems to have established a new equilibrium at a growth rate about half of its prior level.

Nonetheless, while Grand Forks is non-resilient based on annual and 8-year growth rates, the region views itself as resilient, having ultimately recovered from the flood and other shocks of 1997, with population, employment, and GMP all having surpassed their pre-1997 levels. Today, amidst another national recession, the Grand Forks region is experiencing low unemployment, 5 percent compared to the national rate of 10.4 percent.<sup>69</sup> In addition, wages per worker have increased in real terms by 17.7% between 1995-2007.

Figure 3. Employment in Grand Forks Region 1980-2007



**Explaining Resilience/Non-Resilience:**

While the flooding of 1997 was only one of the shocks to the Grand Forks region that year, it is seen as a catalyst, changing how the region and the cities each interacted and their self-image.

When asked how they perceived the region after 1997, interviewees consistently responded that

<sup>69</sup> Unemployment Rates for Metropolitan Areas, Not Seasonally Adjusted, Feb. 2010, accessed at <http://www.bls.gov/web/metro/laummtrk.htm>

the region was better. Two reasons were identified: increased collaboration among the different groups in the area, particularly the business community and local government in the city of Grand Forks, as well as improved interactions between Grand Forks and East Grand Forks, and a belief that, working together, they can improve their community. A third reason often mentioned was the huge influx of money, primarily from the federal government, which enabled new investment in the region.<sup>70</sup> The reliance on federal funding, which often takes several years to disburse, may be part of the explanation for a recovery time frame that exceeded our “resilience” definition.

### **Responses:**

The region of Grand Forks spans two states: North Dakota and Minnesota. The need for a regional approach is evident as the river is all that separates the two cities, and as one person explained, “the river can be narrow or broad.” East Grand Forks has a population of fewer than 8000, leaving it with little power in Minnesota politics, compared to Grand Forks, which is the third largest city in North Dakota. In 1997, Minnesota had a budget surplus, so had resources available to help East Grand Forks while North Dakota was struggling. Additionally, during the flood recovery, the two cities were served by different FEMA and EDA field offices, and Grand Forks was a CDBG entitlement city while East Grand Forks received its CDBG fund through the State. This meant that as Grand Forks and East Grand Forks engaged in rebuilding, they had different directions and restrictions from their federal partners. “You could do things in Minnesota that you couldn’t do in North Dakota, and vice versa, which pulled us apart instead of putting us together.” Despite the river’s ability to separate the cities, it also brings them together with a shared Greenway (funded as State Parks by each state).

*Rebuilding:* Recovering from the flood required the region to reinvest in itself. But investment requires security. This was accomplished through the flood protection programs implemented by each of the cities. Grand Forks residents paid \$92M towards its flood protection system in three assessments (of which one remains). After increasing security, the region was able to rebuild,

---

<sup>70</sup> Funding included \$357M from FEMA assistance; \$142M in Community Development Block Grants, and \$66M from EDA.

with the help of federal funds. As one person explained, “We did about 20 years of redevelopment in 5 years.” Similarly, “that flood did in a week what urban renewal couldn’t do in 40 years.” Almost every person interviewed commented on the physical redevelopment –as an important symbol of the region’s recovery; as evidence of what the community could accomplish when working together and incentive to continue striving for improvement, and as providing important amenities to make the region more attractive to potential residents as well as existing residents (including UND graduates).<sup>71</sup>

The Greenway, which consists of the open space between the banks of the river and the flood protection system, runs along the river on both sides, providing recreational opportunities throughout the year. The Greenway contains 2200 acres, offering two golf courses, three disc golf courses, ice skating and hockey rinks, over 20 miles of multi-purpose trails, shore bank fishing sites, and other recreational activities. Two pedestrian bridges link Grand Forks and East Grand Forks. In Grand Forks the ongoing operations and maintenance are funded through a monthly fee to every residence and business on the utility bill. Operations and maintenance expenses in East Grand Forks were absorbed into the existing budget.<sup>72</sup>

Both cities redeveloped their downtowns, which were destroyed by the flood because of their location along the banks. East Grand Forks was able to take an industrial downtown, populated by old railroad tracks and dilapidated warehouses, and create an area for retail, restaurants, and a movie theater. It used CDBG funds to attract Cabela’s, an outdoor specialty store. According to one city official, an area that previously had \$½ million in taxable value has increased to \$12 to 15 million. In Grand Forks, the vision for a revitalized downtown was driven by Mike Maidenburg, publisher of the Grand Forks Herald at the time. In addition to convincing the city to invest in the downtown, he committed to maintaining the newspaper in its downtown location, although that resulted in a bifurcated location, with production occurring elsewhere in the city. Brownstones and condominiums were built and occupied, adding a residential population downtown, which had been missing prior to the flood.

Federal and state funds in both cities enabled redevelopment which increased amenities in the region; interviewees consistently commented on the improved quality of life with the new

---

<sup>71</sup> The difficulty in attracting educated workers to the Grand Forks region was noted by several people, with the harsh winters being only part of the problem. Some companies, we were told, had moved certain functions to Minneapolis, where it is easier to attract workers, because of the greater amenities of the Twin Cities.

<sup>72</sup> <http://www.grandforksgov.com/greenway/FAQ.htm>



amenities created following the flood. Yet as one person said, “the basics remained – agriculture and the University didn’t go away.” The flood response/recovery was a small piece of a larger, longer term economic development approach in the city of Grand Forks which appears to seek growth and diversification of the region’s economic drivers by pursuing manufacturing, encouraging entrepreneurship and innovation through centers affiliated with the University, and re-envisioning the region as a “Destination” location.

*General Economic Development:* While some interviewees credited the flood with fueling economic development activities in the Grand Forks region, many of the economic development activities were underway prior to 1997. The flood served as a reminder of the importance of economic development as the region struggled to stem population loss, employment loss, and revenue loss.

One of the means by which the city of Grand Forks supports economic development is through its Growth Fund. Adopted in 1988, the growth fund is funded in part by ¼% of the retail sales tax.<sup>73</sup> The fund “can provide gap and business support financing for new or expanding businesses which have the capacity to create new primary sector employment, . . . covering initial construction costs (land, buildings and infrastructure), capital equipment, working capital, or seed rounds.”<sup>74</sup> For example, the Growth Fund contributed \$500,000 towards the Research Enterprise and Commercialization Center (REAC), a level 3 lab. While that sounds like a small sum for many cities, we were reminded by the EDC president and CEO that one needs to extrapolate given that Grand Forks is a city with a population of 50,000.<sup>75</sup> In April 2010, the Growth Fund Committee approved loans to three manufacturers, LM Wind Power, a wind turbine manufacturer (\$500,000 for new equipment), Ideal Aerosmith which makes testing equipment for aircraft and missiles (\$408,000 for a building to expand its operations from its

---

<sup>73</sup> In 1987, the State enabled home rule cities to levy local option sales tax of up to 1% for economic development, infrastructure improvement, property tax relief, and other community uses. Between Grand Forks’ adoption of the tax in 1988 and 1995, it raised \$7M, of which 10% was spent outside the central city and 8% was spent outside the county. Leistriz and Bangsund, 1998. *Regional Economic Development: Evaluation of a Local Initiative in North Dakota. Great Plains Research*, 8(2),281-98. The article notes that the funds examined preclude assisting business located outside of North Dakota, p. 290.

<sup>74</sup> <http://www.grandforks.org/businessresources/localstateprograms.php>

<sup>75</sup> The remainder of the \$8.75 million to build REAC was funded in part by the State Center of Excellence program (\$3.5 million for a CoE in life sciences and advanced technologies), U.S. Economic Development Administration (\$1.5 million), and the North Dakota Development Fund (\$1 million). The Knight Foundation provided a \$550,000 grant for operational expenses. <http://www.undrf.org/reac-1-open-house>

current location in East Grand Forks), and American Defense, which makes metal components for military vehicles (\$220,500 for an addition and equipment).<sup>76</sup> Ideal Aerosmith came to East Grand Forks in 1984 as the first occupant of a new industrial park that had been built with EDA funds and a TIF. East Grand Forks city employees supported the company's expansion into Grand Forks, explaining that "we don't have 20,000 square foot buildings sitting around and you have to make good business decisions, whether you are on this side of the river or that side." The cities appear to work together, as partly evidenced by the merging of their Chambers of Commerce in [2006].<sup>77</sup>

*Destination City:* In his 2003 State of the City address, Mayor Mike Brown stated: "my vision is that we become a destination city," a great place not only to live and do business, but to visit. He asked for an increase in the sales tax, which was defeated, as well as a commitment to the Greenway and the water park and community center by the Alerus Center. This vision, according to interviewees, gave leaders and residents a direction as they left the flood behind them.

The goal is to attract visitors from Winnipeg, a city of 800,000 located 145 miles to the North. Part of that strategy builds on cheap air service to Phoenix and Las Vegas. Grand Forks recently attracted Allegiant Air, which runs a few flights a week between Grand Forks and these other locations. Airplane tickets are significantly cheaper in the U.S. because of the Canadian national tax, creating a market for Winnipeg residents to come to Grand Forks. The airport is working with local hotels and attractions to keep Winnipeg residents in Grand Forks for a day or two before or after their flights. The community development projects (e.g., the Greenway, Ralph Engelstad Arena, Canad Inn) have contributed to that strategy as well.

*University:* The University of North Dakota (UND) plays a major role in the region, not just as an employer but as a source of innovation. The University has grown from 10,000 students to 13,000, and it is a center of export activity in terms of students, research, and training. The University is affiliated with four independent research centers, each with an energetic and

---

<sup>76</sup> Tran, Tu-Uyen (April 21, 2010). GF Loans for Manufacturers on Track. *Grand Forks Herald*. Accessed at [http://www.grandforksherald.com/event/article/id/158627/publisher\\_ID/40/](http://www.grandforksherald.com/event/article/id/158627/publisher_ID/40/)

<sup>77</sup> The plan was for the merged Chamber to locate in East Grand Forks. East Grand Forks donated land to the Chamber in 2007, but the Chamber chose not to relocate from Grand Forks and returned the land in 2009.

entrepreneurial leader: the Energy and Environment Research Center (EERC), which has 10 Centers of Excellence; the Innovation Center; the Odegard School of Aerospace Sciences; and the newest addition, REAC, which houses the State's Center of Excellence in Life Sciences and Advanced Technologies and the only level 3 lab in the State. Each of these centers is operated through a foundation, which increases its opportunities by offering greater speed, more intellectual property protection, creative methods for funding research, and more opportunities for commercialization.

*The UAS Mission:* The most recent shock to the community was the loss of its last tanker group at the Air Force Base as part of the 2005 BRAC. In its place, the base was to prepare itself for an unmanned aerial systems (UAS) mission, in anticipation of receiving Predator and Global Hawk unmanned aerial vehicles. The region's response to this shock was to embrace the change and proactively develop a community plan to support this new mission. The activities that have occurred in the Grand Forks region with respect to the UAS mission suggest that changes that occurred following the flood have been institutionalized, resulting in a new culture within the community. This includes recognition of the importance of understanding the region's strengths and weaknesses. For example, the UAS mission builds on the region's [competitive] advantage in energy research (conducting cold weather testing, renewable energy, tactical fuels), engineering (developing payloads and sensors), pilot training programs, the Minnesota community college's aircraft maintenance program (with its new certificate in unmanned aircraft vehicle (UAV) maintenance). It also benefits from the base's location in a sparsely populated area with uncrowded airspace.

## **Results:**

Is the region resilient? The economy resembles its traditional roots to an extent. The railroad rumbles through town pulling freight. Sugar beet trucks head to Crystal Sugar in East Grand Forks. And, the airbase is once again under threat. While the methodology we used indicate a region that is not resilient, perhaps because of the few local levers available to a region of under 100,000 people, the region of Grand Forks is weathering the current economic environment well.

In 1980, only three sectors – military, state government, and agriculture – had location quotients greater than 2. In 2007, food manufacturing (LQ 2.4) and mining (LQ 4.7) had joined the original three; yet these growing industries each employ fewer than 5 percent of the region’s workers (1400 and 675 employees, respectively). The original three export industries continue to be economic drivers, with UND the largest employer in the region (6385 employees in 2009).

### *Seattle*

Employment downturns in the Seattle regional economy have occurred around the time of national recession periods. The region experienced shock-induced downturns in 1980-81, 1990, 1993, and 2000-01. It was resilient to the 1993 and 2000-01 shock-induced downturns, but not resilient to the 1980 downturn. (There was little opportunity for resilience to the 1990 downturn because the 1993 downturn occurred so soon thereafter.) Shocks to the region’s major export industries preceded or accompanied the aggregate regional downturns. Wood products (formerly a major regional export industry) suffered employment downturns in 1978-79. Software had such downturns in 1993 and 2000-01, although these downturns appeared as sharp reductions of the industry’s employment growth rate rather than as job losses. (Microsoft, the region’s largest information technology employer, laid off workers for the first time during the Great Recession.) Aerospace experienced downturns in 1980-82, 1990-93, 1998-99, and 2002, and all these downturns were employment declines. However, their impact on the region as a whole probably became less severe over time as Boeing, the region’s largest manufacturer, accounted for a declining (though still substantial) share of the region’s employment. The regional economic development policymakers and practitioners we interviewed perceived the Great Recession as the region’s most severe economic downturn since the early 1970s, although as of the time we conducted our interviews (July 2009) the region’s employment was higher, as a percentage of pre-recession employment, than at the same time after the 2001 recession, and it had not hit the employment trough that it reached after the 1981 recession.

After the severe early 1970s recession, policymakers perceived a need to diversify the region’s economy away from its strong reliance on aerospace manufacturing in general and Boeing in particular. Local government and business leaders created the King County Economic Development Council, now called Enterprise Seattle, to recruit new firms to the region.

However, diversification of the employment base came about not as a result of any deliberate policy or strategy but because of a historical accident: Bill Gates moved Microsoft to the region in 1979. Other information technology-intensive firms (Starbucks, Amazon, and Costco, as well as suppliers to them and to Microsoft) sprang up subsequently, in part to take advantage of proximity to Microsoft and the large pool of information technology workers that it attracted to the region. (Some local information technology companies were founded by former Microsoft managers or engineers.)

As of July 2009, no public or private organization had undertaken or planned any policy or strategy to restructure the regional economy in response to the Great Recession. Our interviewees did not think any such restructuring was necessary. They viewed the regional economy as sufficiently diverse because it is built around two large firms, Boeing and Microsoft, which have steadily introduced new products and around which distinct industry clusters (in aerospace and information technology, respectively) have formed. Our interviewees believed that the region's eventual recovery from the Great Recession would be a continuation of pre-recession trends, including further growth of the information technology industry and the gradual movement of Boeing away from the region (including the relocation of the firm's headquarters to Chicago and its opening of a new aircraft production line in South Carolina, its first outside the Seattle area). They also anticipated further growth of the nonprofit sector, which has been fueled largely by funding from current and former Microsoft executives.

### *Hartford*

Employment shock-induced downturns in the Hartford regional economy occurred around national recession periods in 1980-81 and 2001-02. However, the region experienced a downturn in 1988-90 rather than in 1990-91 as the nation as a whole did. The region was resilient to the 1980-81 and 2001-02 shocks within two years but was not resilient to late 1980s shock. The early 1980s downturn was accompanied by precipitated by shocks to manufacturing industries: fabricated metals, electrical equipment, printing, and aerospace. The late 1980s downturn was preceded and followed by shocks to the insurance industry and accompanied by a

downturn in fabricated metal manufacturing (largely aerospace suppliers).<sup>78</sup> The 2001-02 downturn was preceded by shocks in insurance, aerospace, and fabricated metals.

Policymakers and practitioners perceived the late 1980s shock-induced downturn as the region's most severe before the Great Recession, and the employment downturn of that shock was largest of any of the last four recessions, including the Great Recession. A large downturn in the commercial real estate market, in which local insurance companies were heavily invested, precipitated the late 1980s shock to insurance and probably to the region as a whole. In 1993 the Greater Hartford Chamber of Commerce created a regional economic development (business recruitment and retention) agency in response to that shock. After reorganization, this eventually became the Metro Hartford Alliance (MHA), which gradually expanded its mission to include attraction and retention of highly educated workers, regional place-marketing, public policy advocacy, and entrepreneurship assistance. A large number of sometimes competing regional industry-specific nonprofit organizations, some supported by CT's state cluster initiative, were founded during the 1990s and early 2000s to deal with industry-specific production, technology, workforce, education, and place-marketing issues in manufacturing, insurance, high technology, and medical devices, but these were not founded as responses to industry or regional aggregate shocks and they do not view responding to these shocks as their primary mission. Neither MHA nor these industry-specific organizations deals with the regional economy as a whole.

No public or private organization undertook or planned any policy or strategy to restructure the regional economy in response to the late 1980s downturn. However, the economic structure has changed gradually following that downturn. Large aerospace manufacturers have gradually shifted production overseas. Insurance companies have moved more routine clerical work to lower-cost regions while maintaining R&D in the Hartford area. Both insurance and aerospace manufacturing, the region's dominant export industries, account for smaller shares of employment today than thirty years ago. The regional economy has become smaller but richer; regional average productivity and wages have grown by much more than the national average over the last three decades, while regional employment has never regained its 1988 peak level. Although local (zoning), state, and federal public policies influenced these developments, organized public or non-market private activity did not. The

---

<sup>78</sup> Insurance company payouts related to 1992's Hurricane Andrew may account for the insurance industry shock that followed the overall regional shock.

economic development practitioners and public officials we interviewed attributed the lack of such activity to the region's local government fragmentation and the proliferation of small, often competing private economic development organizations.

## **Summary and Conclusion**

What have we learned about regional resilience to economic shock?

We began by defining economic shock, shock-resistance, economic downturns, and economic resilience both conceptually and operationally. We conceptualize regional economic resilience as the ability of a region to recover successfully from shocks to its economy that throw it substantially off its prior growth path and cause an economic downturn. Shocks can be of three kinds: 1) shocks caused by downturns in the national economy (national economic downturn shocks); 2) shocks caused by downturns in particular industries that constitute an important component of the region's export base (industry shocks), and 3) other external shocks (a natural disaster, closure of a military base, movement of an important firm out of the area, etc.). These shocks are not mutually exclusive; a regional economy may experience more than one simultaneously.

Not all shocks throw an economy substantially off its prior growth path. When a shock occurs that does not cause the region to be thrown off its prior growth path – i.e., to experience an economic downturn – we term the region “shock-resistant” to that shock. If the region is adversely affected by the shock, we consider it “resilient” if it returns to its prior growth path within a relatively short period of time. If it does not, we consider it “non-resilient.”

Using a data base consisting of annual metropolitan level employment data for 361 MSAs from 1970-2006, we identified nearly 1500 shocks to regional economies. In nearly half of these cases (47%), the affected region was “shock-resistant” – it did not suffer a serious economic downturn (defined as a drop in its prior eight year annual growth rate of more than two percentage points) as a result of the shock. Regions suffering a downturn as a result of a shock were “resilient” 65% of the time, i.e., they returned to at least their prior eight year average employment growth rate within a reasonably short period (four years). Regions that were adversely affected by a shock were less likely to be resilient if the shock was a national economic downturn alone (to which 55% of adversely affected regions were resilient) than if it were a national industry shock alone (80% resilient) or a local industry shock alone (77%

resilient). There was virtually no regional variation in the extent to which metropolitan areas were resistant to shock or in the extent to which, once adversely affected, they were resilient. The average length of time to resilience for a region after having suffered a shock-induced downturn was 2.9 years, which is more than a year less than found by Blanchard and Katz (1992) for employment shocks at the state level.

We next moved from description to explanation, asking what makes some regions more prone to economic downturns than other regions; why some areas, when faced with an economic shock, are “shock-resistant,” while others experience economic downturns; why some areas that experience an economic downturn are “resilient,” while others are non-resilient; and what accounts for the time a region experiencing a downturn takes to return to its previous employment growth rate.

We were able to test some, but not all, of the hypotheses suggested by the literature we cited and reviewed in the first part of our paper. Regional economic structure mattered. Regions that had a higher proportion of their employment in durable goods manufacturing were likely to experience *more downturns* and to be *less shock-resistant*. However, they were also more likely to be *resilient* after experiencing a downturn and to take fewer years to become resilient. As we observed, these results make sense in light of the cyclical nature of employment patterns. As Briguglio (2006) hypothesized, industrial concentration also mattered: The greater the number of major export industries in a region, the less susceptible the region is to a downturn and the more shock-resistant it is. Similarly, the greater the industrial diversity of a region, the more likely it is to be resilient to a downturn.

However, human capital played a role as well. Regions that had a higher proportion of working age population with a high school degree or less were likely to experience *more downturns* and to be *less shock-resistant*. However, they were also more likely to be *resilient* after experiencing a downturn and to take fewer years to become resilient. The latter finding is surprising, since it is generally assumed that better-educated individuals are more adaptive to economic transformations that require changes in behavior and skill sets. However, if resilience is simply a “bounce-back” of a region due to downturns caused by national economic shocks, there is little need for such adaptive behavior.

Other findings that emerged from our analysis included:



- Labor market flexibility is related to resilience. Regions in states with Right-to-Work laws are likely to be more resilient when experiencing a downturn than other regions and also take less time to recover to their prior growth rates.
- The greater the income disparities in a region, the more likely it is to experience a downturn and the longer it takes to return to its prior growth rate after the downturn.
- Regions in the Northeast and the South (controlling for all other variables) were likely to experience more downturns, be less shock-resistant, less resilient when experiencing a downturn, and take more years to return to their prior growth rates. In other words, some characteristics associated with these regions, apart from the other variables in our model that we have controlled for, are associated with these systematic responses.

The quantitative work we report on above provides descriptive results about frequency of shocks, shock-resistance, and resilience and evidence about what regional characteristics are associated with shock-resistance and resilience. They tell us little, however, about the processes through which regions protected themselves from or responded to downturns caused by economic shocks. These processes remain a “black box.” To gain insight into the black box, we turn to our case studies. From these we gain not only insight and perspective, but also a set of new questions.

The case studies encompass a wide range of experience. All six of the regions were adversely affected by national economic downturn shocks, but in most cases they simply bounced back when the national economy recovered. However, there were exceptions. Detroit and Cleveland have not bounced back from the recessionary shock of 2000; Seattle was non-resilient to the 1980 national economic downturn shock; Hartford was not resilient to a downturn that occurred around the time of the 1990 recession. Many of the regions also experienced industry shocks that produced economic downturns.

Over the course of the nearly 30 year period we examined we can characterize Detroit and Cleveland as regions that up until the turn of the century simply rode out downturns without changing their economic structure, Charlotte as a region that was resilient as a result of an economic transformation from textiles and apparel as its economic drivers to finance and

insurance, Seattle as a region that has successfully transformed its economy twice, first from wood product manufacturing to transportation (aircraft) equipment manufacturing, and then to software and Hartford and Grand Forks, which suffered industry shocks to which they have not been resilient and instead seem to have established new equilibriums at lower levels of employment growth.

Why did these differing experiences play out as they did? Our first conclusion is that in virtually all cases the region's resilience or lack thereof was primarily a product of 1) what was happening to its major export industries nationally and 2) the behavior of individual firms within the region. The strategic decisions of individual firms and their leaders, as well as decisions by entrepreneurs in the area were the key actions within the region that affected the region's economy and determined whether or not it proved resilient. Charlotte's transformation to a finance center was largely a result of decisions made by the dynamic leaders of two financial institutions headquartered there. Seattle's transformation to a software-based economy was virtually a historical accident – Bill Gates' decision to move there in the late 1970s and the subsequent birth of Microsoft and other information technology-intensive firms around it (although the region's educated labor force and amenity attractions to educated in-migrants undoubtedly facilitated the growth of this sector). Detroit's economy reflected decisions that the big three auto firms made as the auto industry globalized that ultimately reduced their competitiveness and thus the region's economy.

The various shock-induced downturns were often met with public concern and public activity, with the exception of Detroit, where people believed the regional economy would simply recover when the national economy recovered. New organizations and new programs were formed with goals related to diversification, promoting entrepreneurship and innovation, and more intensive area marketing. Cleveland has tried the full panoply of organizations and programs (and supported the consulting industry), following recommendations from Rand, McKinsey, and Deloitte in its quest to restructure its economy to be more robust. In Detroit, there have been a variety of recent efforts in which foundations have played an important if not the lead role, such as the New Economy Initiative. Charlotte's Chamber of Commerce initiated the "Advantage Carolina" project in 1998. In the wake of a serious recession, Seattle created Enterprise Seattle to recruit new firms to the region. In response to the 1990 recession and the industry shock to the insurance industry, the Greater Hartford Chamber of Commerce created a

regional economic development (business recruitment and retention) agency. However, there has been little or no public or civic response in the Hartford region in terms of organizational creation or restructuring or regional strategy in response to the downturns related to the recessions of 2000 or of 2008. Interviewees said there was no need, since the region was already sufficiently diverse in that it was built primarily on two firms in very different sectors.

Organizational creation and restructuring were a “response” to shock. So, in some cases, were increased efforts at collaboration across previously impervious boundaries or network creation among firms in similar sectors or engaged in similar kinds of activities. Many people we interviewed in the Detroit area noted the increased efforts at regional collaboration during the past several years, an activity that was nearly absent prior to the 2000 economic downturn from which the region has not yet recovered. Similarly, the twin shocks of military base closings and the 1997 flood triggered substantial increases in collaboration in the Grand Forks region; as we noted earlier, these shocks were seen by community members as a catalyst, changing how the community interacted and its self-image. In the Hartford region several industry-specific organizations, some supported by the state cluster initiative were founded during the 1990s and early 2000 to spur development in specific industry sectors, but these were responses to the region’s long-term economic stagnation rather than responses to specific shock-induced downturns.

What effect did these explicit efforts to promote economic growth have? First, while all of the six regions engaged in traditional economic planning and development activities (marketing and promotion, tax subsidies, job training programs), there is no reason to believe that they had a major role in determining whether the region was shock-resistant or resilient to downturns caused by shock. This is not to say that these programs were ineffective or that they weren’t better in some places than in others; however, virtually nobody we interviewed thought that they played a major role in the region’s resiliency, and we find no reason to quarrel with that assessment.

The effect of other explicit responses is difficult to gauge. Some reflected a reasonable understanding of the region’s economic condition and long-term prospects better than did others. To the effect that they reflect community concern, cohesion, and concerted activity they are surely a good thing. But there have been no serious efforts at evaluation, and, indeed, it is difficult to determine how, even in principle, they might be systematically evaluated.

Particularly in the presence of other major forces – the activities of the area’s existing firms - it is virtually impossible to judge their effects.

Our focus to this point has been on *responses*. Do some regions engage in *precautionary planning* that make it less likely for their economies to experience shock-induced downturns or more likely that, if they do experience such downturns, they will be resilient to them? We found little evidence of this kind of advance planning. Indeed, in many cases the *response* to shock-induced downturns included expressions of regret at not having taken such precautionary action. A frequent question was why a region – Detroit is a particularly good example – had failed to diversify to avoid the problems associated with concentration in one sector. But this begs the question in two senses. First, as some of the people in Detroit observed, the dependence on the auto industry had brought them prosperity for nearly a century. They may be paying for that now, but a century is a pretty good run for a regional economy. Second, even had they wanted to diversify, what could or should they have done. Expressing the desirability for diversification is not the same as actually doing it; what are the leverage points in the regional economy that could have been manipulated to bring about diversification?

Perhaps, however, other community characteristics unrelated either to specific responses highlighted in our case studies or to observed characteristics employed as variables in our multivariate analysis contribute to a region’s ability to be resistant to shock or to be resilient through economic transformation when its existing economic drivers decline and do not bounce back. Charlotte, for example, has a long-term business-friendly culture that made it possible for two local banks to trigger huge growth in the region’s banking and finance sector. Seattle has at least the reputation of having an entrepreneurial culture that facilitates the growth of new firms and new technologies. Detroit, on the other hand, has a history of adversarial labor-management relations, high costs, and a procurement culture that has served to stifle innovation and entrepreneurship. Cleveland has been called the “partnership city” in light of the relationship between the public and private sector. At its heyday in the 1980s, when Voinovich was Mayor, the partnership was effective in improving city operations as well as completing bricks and mortar projects (including the Great Lakes Science Center and the Rock and Roll Hall of Fame).<sup>79</sup>

---

<sup>79</sup> One former mayor explained to us: The public sector doesn’t always “understand how important [the business community] is. Mayors need to understand they can’t do it by themselves. They need the help of business, also

Grand Forks is particularly interesting in that our interviewees stressed how resilient the area was and how successful its recovery was from the industry shock and flood of 1996-97. Yet our data show that the region was non-resilient to that shock and, indeed, seems to have established a new equilibrium at an employment growth rate considerably lower than its previous one. And, indeed, perhaps the evaluation of the Grand Forks community is equally as or even more relevant as the picture presented by our data. Regional economic resilience may incorporate a subjective factor; the region has continued to grow and prosper and residents seem happy with the results. In 1995, the year prior to the onset of the regional downturn wages per worker amounted to \$24,414 in 2005 dollars; in 2007 wages per worker had increased by 17.7% to \$28,726, also in 2005 dollars.

Hartford presents a different scenario. Employment in the region was actually nearly 30,000 jobs less in 2007 than it was in 1988. Yet wages per worker in 2005 dollars had increased by 35.9% from \$39,019 per worker in 1988 to \$53,030 in 2007. It appears that the Hartford region has shed a large number of low-income workers, including many back office workers in the insurance industry, and has retained or added high wage workers to its economy.

This leads us back to some fundamental questions about regional economic resiliency. First, is regional employment growth the right way to measure and track resiliency or is wage growth a more appropriate indicator? Secondly, to what does resiliency refer? Does a resilient economy refer to the region's residents at the beginning of a period or whatever is present on the region's geography at any period of time? Was the Hartford region not resilient because it lost large numbers of low-skilled jobs and established a new essentially no-employment growth equilibrium or was it resilient because its economy has continued to produce substantial growth in regional product and in wages per worker. And perhaps most interesting of all, is resiliency a concept that should include a subjective element? If the Grand Forks region, despite a new equilibrium employment growth rate that, while positive, is still substantially lower than its previous one and accompanied by real but modest growth in wages per worker, has adopted as part of its view of itself that it is a successful region that has made a resilient response to

---

foundations play an important role.” When the public and private sector were unable to work together, particularly when Campbell became Mayor in 2002, the region appears to have suffered.

economic shocks that have affected it, does that make it resilient, at least in terms of economic psychology?

## Appendix

Table 2

**Model 1: Likelihood of metropolitan area experiencing a downturn in a given year**

Variable	Cox Regression: Conditional Gap Time Model			
	Coefficients	Standard Errors	Hazard Ratios	Standard Errors
Percent of population with high school education or less	0.038***	0.007	1.038***	0.008
Lagged employment	-0.000	0.000	1.000	0.000
Percent of employment in Durable manufacturing	0.019**	0.008	1.019**	0.008
Percent of employment in Non-Durable manufacturing	0.002	0.012	1.002	0.012
Percent of employment in Health Care and Social Assistance	-0.115***	0.028	0.891***	0.025
Percent of employment in Tourism-Related Industries	0.006	0.012	1.006	0.012
Number of export-based sectors	-0.047**	0.024	0.954**	0.023
Overall Herfindahl index	0.020*	0.011	1.020	0.011
National Economic Downturn Shock	1.066***	0.078	2.903***	0.227
Local Industry Shock Alone	1.098***	0.106	2.999***	0.317
National Industry Shock Alone	1.517***	0.134	4.559***	0.611
National Econ. Downturn Shock and Local Ind. Shock	1.133***	0.136	3.106***	0.422
National Econ. Downturn Shock and National Ind. Shock	1.551***	0.089	4.718***	0.419
Northeast	-1.223***	0.226	0.294***	0.066
Midwest	-0.285*	0.172	0.752*	0.130
South	-0.830***	0.170	0.436***	0.074
MSA age	0.002*	0.001	1.002*	0.001
Percent of population in principal city	-0.001	0.003	0.999	0.003
Number of research universities (2010)	0.042	0.077	1.043	0.080
Right to work laws	-0.032	0.130	0.969	0.126
Percent of population Non-Hispanic Black	-0.003	0.006	0.997	0.126
Percent of population Hispanic	-0.011**	0.004	0.989**	0.004
Income Ratio 80-20	0.254**	0.119	1.289**	0.153
$Chi^2$	768.65			
$Prob > Chi^2$	0.0000			
$N$	6409			

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 3

**Model 2: Did Shock Result in a Downturn (Logit)**

<u>Variable</u>	<u>Coefficients</u>	<u>Standard Errors</u>	<u>Odds Ratio</u>	<u>Standard Errors</u>
Percent of population with high school education or less	0.026***	0.007	1.026***	0.008
Total employment	0.000	0.000	1.000	0.000
Percent of employment in Durable Manufacturing	0.024***	0.009	1.024***	0.009
Percent of employment in Non-Durable Manufacturing	0.001	0.011	1.001	0.011
Percent of employment in Health Care and Social Assistance	-0.095***	0.036	0.909***	0.033
Percent of employment in Tourism-Related Industries	0.008	0.018	1.008	0.018
Number of export-based sectors	-0.075**	0.030	0.928**	0.028
Overall Herfindahl Index	-0.025**	0.012	0.976**	0.012
Local Industry Shock Alone	-0.726***	0.155	0.484***	0.075
National Industry Shock Alone	-0.177	0.176	0.837	0.147
National Econ. Downturn Shock and Local Ind. Shock	2.099***	0.391	8.154***	3.189
National Econ. Downturn Shock and National Ind. Shock	1.514***	0.238	4.543***	1.080
Northeast	-0.360	0.310	0.698	0.216
Midwest	-0.037	0.196	0.964	0.189
South	-0.363*	0.204	0.696*	0.142
MSA age	0.003	0.002	1.003	0.002
Percent of population in principal city	-0.004	0.004	0.996	0.004
Number of research universities (2010)	0.165	0.170	1.179	0.120
Right to work laws	0.068	0.143	1.071	0.153
Percent of population Non-Hispanic Black	0.011*	0.006	1.011*	0.006
Percent of population Hispanic	0.001	0.004	1.001	0.004
Income Ratio 80-20	-0.173	0.138	0.841	0.116
<i>Chi</i> <sup>2</sup>	226.210			
<i>Prob &gt; Chi</i> <sup>2</sup>	0.0000			
<i>Pseudo R</i> <sup>2</sup>	0.15			
<i>N</i>	1467			

\*\*\* p &lt; 0.01, \*\* p &lt; 0.05, \* p &lt; 0.1



Table 4

**Model 3: Was Metropolitan Area Resilient to Downturn (Logit)**

<u>Variable</u>	<u>Coefficients</u>	<u>Standard Errors</u>	<u>Odds Ratio</u>	<u>Standard Errors</u>
Percent of population with high school education or less	0.078***	0.010	1.081***	0.011
Total employment	-0.000	0.000	1.000	0.000
Percent of employment in Durable manufacturing	0.039***	0.014	1.040***	0.014
Percent of employment in Non-Durable manufacturing	-0.000	0.021	1.000	0.021
Percent of employment in Health Care and Social Assistance	-0.026	0.031	0.974	0.030
Percent of employment in Tourism-Related Industries	0.017	0.021	1.017	0.022
Number of export-based sectors	-0.053	0.041	0.948	0.039
Overall Herfindahl index	0.038*	0.021	1.039*	0.022
Pre-downturn growth rates	-0.031	0.034	0.969	0.033
National Economic Downturn Shock	0.138	0.212	1.148	0.243
Local Industry Shock Alone	0.299	0.235	1.349	0.317
National Industry Shock Alone	0.258	0.296	1.295	0.384
National Econ. Downturn Shock and Local Ind. Shock	-0.384	0.311	0.681	0.212
National Econ. Downturn Shock and National Ind. Shock	-0.460*	0.251	0.631*	0.159
Northeast	-0.827**	0.359	0.437**	0.157
Midwest	-0.408	0.284	0.665	0.189
South	-0.931***	0.306	0.394***	0.121
MSA age	-0.002	0.002	0.998	0.002
Percent of population in principal city	0.000	0.005	1.000	0.005
Number of research universities (2010)	-0.013	0.142	0.987	0.140
Right to work laws	0.774***	0.225	2.169***	0.489
Percent of population Non-Hispanic Black	0.016	0.011	1.016	0.011
Percent of population Hispanic	0.013*	0.007	1.013*	0.008
Income Ratio 80-20	-0.146	0.153	0.865	0.132
<i>Chi</i> <sup>2</sup>	170.54			
<i>Prob &gt; Chi</i> <sup>2</sup>	0.0000			
<i>Pseudo R</i> <sup>2</sup>	0.17			
<i>N</i>	1011			

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 5

**Model 4: Does Metropolitan Area Recover from a Downturn in a Given Year**

Variable	Cox Regression: Conditional Gap Time Model			
	Coefficients	Standard Errors	Hazard Ratios	Standard Errors
-				
Percent of population with high school education or less	0.065***	0.010	1.067***	0.010
Lagged employment	-0.001***	0.000	0.999***	0.000
Percent of employment in Durable manufacturing	0.031***	0.010	1.031***	0.010
Percent of employment in Non-Durable manufacturing	0.014	0.012	1.015	0.012
Percent of employment in Health Care and Social Assistance	-0.047*	0.027	0.954*	0.026
Percent of employment in Tourism-Related Industries	0.007	0.014	1.007	0.014
Number of export-based sectors	-0.009	0.029	0.991	0.029
Overall Herfindahl index	0.006	0.015	1.006	0.015
Pre-downturn growth rates	-0.107***	0.028	0.898***	0.025
National Economic Downturn Shock	0.489***	0.188	1.630***	0.306
Local Industry Shock Alone	0.007	0.159	1.007	0.161
National Industry Shock Alone	-0.008	0.157	0.992	0.156
National Econ. Downturn Shock and Local Ind. Shock	0.221	0.211	1.247	0.263
National Econ. Downturn Shock and National Ind. Shock	0.291	0.182	1.338	0.244
Northeast	-0.595**	0.244	0.552**	0.135
Midwest	-0.572***	0.207	0.564***	0.117
South	-0.759***	0.217	0.468***	0.102
MSA age	0.001	0.001	1.001	0.001
Percent of population in principal city	0.001	0.004	1.000	0.004
Number of research universities (2010)	0.343***	0.094	1.409***	0.133
Right to Work Laws	0.368**	0.151	1.444**	0.219
Percent of population Non-Hispanic Black	0.013*	0.008	1.013*	0.008
Percent of population Hispanic	0.010*	0.006	1.010*	0.006
Income Ratio 80-20	-0.255*	0.150	0.775*	0.116
$Chi^2$	240.56			
$Prob > Chi^2$	0.0000			
$N$	4982			

\*\*\* p &lt; 0.01, \*\* p &lt; 0.05, \* p &lt; 0.1

Table 6

<b>Summary Statistics (1978-2007)</b>				
<u>Variable</u>	<u>Source</u>	<u>Mean</u>	<u>Min</u>	<u>Max</u>
Percent of population with high school education or less	Census /DataFerrett/GeoLytics	58	22	83
Lagged employment (Thousands of Jobs)	Economy.com	271	5	8532
Percent of employment in the following categories:				
- Durable manufacturing (NAICS 33)	Economy.com/Own Calculations	9	0	43
- Non-Durable (31, 32)	Economy.com/Own Calculations	6	0	38
- Health Care and Social Assistance (62)	Economy.com/Own Calculations	9	1	36
- Tourism-Related Industries (Arts, Entertainment, Recreation, Accommodation, and Food-Services) (71-72)	Economy.com/Own Calculations	3	0	14
Number of export-based sectors	Economy.com/Own Calculations	5.21	0	15
Overall Herfindahl index	Economy.com/Own Calculations	13	7	69
Pre-downturn growth rates	Economy.com/Own Calculations	3	-13	20
National Economic Downturn Shock	Economy.com/Own Calculations	0.28	0	1
Local Industry Shock Alone	Economy.com/Own Calculations	0.39	0	1
National Industry Shock Alone	Economy.com/Own Calculations	0.16	0	1
National Econ. Downturn Shock and Local Ind. Shock	Economy.com/Own Calculations	0.06	0	1
National Econ. Downturn Shock and National Ind. Shock	Economy.com/Own Calculations	0.12	0	1
Northeast	Census	0.25	0	1
Midwest	Census	0.40	0	1
South	Census	0.22	0	1
MSA age (Numbers of years since principal city passed 50,000 in population in a decennial census)	Historical Census Data	52	0	210
Percent of population in principal city	Census /DataFerrett/GeoLytics	44	10	100
Number of research institutions (Universities classified by the Carnegie Foundation as involved in either high or very high research activity)	Carnegie Foundation	0.51	0	13
Right to work laws	www.nrtw.org	0.42	0	1
Percent of population Non-Hispanic Black	Census /DataFerrett/GeoLytics	10	0	48
Percent of population Hispanic	Census /DataFerrett/GeoLytics	7	0	94
Income Ratio 80-20	Census /DataFerrett/GeoLytics	4.18	2.98	7.95

Note: Statistics are for fully pooled data. Models will exclude certain observations.

## References

- Bartik, Timothy J., and Randall W. Eberts. 2006. "Urban Labor Markets." In *A Companion to Urban Economics*, edited by Richard J. Arnott and Daniel P. McMillen, pp. 389-403. Malden, MA: Blackwell.
- Blanchard, Olivier, and Lawrence F. Katz. 1992. "Regional Evolutions." In *Brookings Papers on Economic Activity* 1992, no. 1, edited by William C. Brainard and George L. Perry, pp. 1-75. Brookings.
- Blumenthal, Pamela; Wolman, Harold; and Hill, Edward. 2009. "Understanding the Economic Performance of Metropolitan Areas in the United States." *Urban Studies*. 46 (3) 605-627.
- Box-Steffensmeier, Janet, and Bradford Jones. 2004. *Event History Modeling*. New York: Cambridge University Press.
- Box-Steffensmeier, Janet, and Christopher Zorn. 2002. "Duration Models for Repeated Events," *Journal of Politics* 64: 1069-1094.
- Briguglio, Lino, Gordon Cordina, Nadia Farrugia, and Stephanie Vella. 2006. "Conceptualising and Measuring Economic Resilience". In L. Briguglio, G. Cardigan E. J. Kisanga (eds), *Building the Economic Resilience of Small States*. Malta: Islands and Small States Institute and London: Commonwealth Secretariat, 265-87.
- Chinitz, Benjamin. "Contrasts in Agglomeration: New York and Pittsburgh." *American Economic Review* 51: 279-289.
- Christopherson, Susan, and Jennifer Clark. 2007. "Power in Firm Networks: What It Means for Regional Innovation Systems." *Regional Studies* 41: 1223-1236.
- Desmet, Klaus, and Esteban Rossi-Hansberg. 2009. "Spatial Growth and Industry Age," *Journal of Economic Theory* 144: 2477-2502.
- Duranton, Gilles, and Diego Puga. 2001. "Nursery Cities: Urban Diversity, Process Innovation, and the Life Cycle of Products," *American Economic Review* 91: 1454-1477.
- Duval, Romain, Jorgen Elmeskov, and Lukas Vogel. 2007. "Structural Policies and Economic Resilience to Shocks." Economics Department Working Paper 567. Paris: Organisation for Economic Cooperation and Development.
- Feyrer, James, Bruce Sacerdote, and Ariel Dora Stern. 2007. "Did the Rust Belt Become Shiny? A Study of Cities and Counties That Lost Steel and Auto Jobs in the 1980s" In *Brookings-*

*Wharton Papers on Urban Affairs 2007*, edited by Gary Burtless and Janet Rothenberg Pack, pp. 41-102. Brookings.

Flynn, Patricia M. 1984. "Lowell: A High Technology Success Story," *New England Economic Review*, Sept./Oct., pp. 39-49.

Glaeser, Edward L., and others. 1992. "Growth in Cities," *Journal of Political Economy* 100: 1126-52.

Glaeser, Edward L., and Albert Saiz. 2004. "The Rise of the Skilled City." In *Brookings-Wharton Papers on Urban Affairs 2004*, edited by William G. Gale and Janet Rothenberg Pack, pp. 47-94. Brookings.

Glaeser, Edward L., Jose A Scheinkman, and Andrei Shleifer, 1995. "Economic Growth in a Cross-Section of Cities," *Journal of Monetary Economics* 36: 117-43.

Gottlieb, Paul D., and Michael Fogarty. 2003. "Educational Attainment and Metropolitan Growth," *Economic Development Quarterly* 17: 325-36.

Harrison, Bennett. 1984. "Regional Restructuring and 'Good Business Climates': The Economic Transformation of New England Since World War II." In *Sunbelt/Snowbelt*, edited by Larry Sawers and William Tabb, pp. 48-96. New York: Oxford University Press.

\_\_\_\_\_, Maryellen Kelley, and Jon Gant. 1996. "Specialization versus Diversity in Local Economies: The Implications for Innovative Private-Sector Behavior," *Cityscape* 2: 61-93.

Hausmann, Ricardo, Lant Pritchett, and Dani Rodrik. 2004. "Growth Accelerations," NBER Working Paper 10566. Cambridge, MA: National Bureau of Economic Research.

Henderson, Vernon. 2003. "Marshall's Scale Economies," *Journal of Urban Economics* 53: 1-28.

\_\_\_\_\_, Ari Kuncoro, and Matt Turner, "Industrial Development in Cities," *Journal of Political Economy* 103: 1067-90.

Kolko, Jed, and David Neumark. 2010. "Does Local Business Ownership Insulate Cities from Economic Shocks?" *Journal of Urban Economics* 67: 103-115.

Markusen, Ann. 1985. *Profit Cycles, Oligopoly, and Regional Development*. Cambridge: MIT Press.

Norton, R.D., and J. Rees. 1979. "The Product Cycle and the Spatial Decentralization of American Manufacturing," *Regional Studies* 13: 141-151.

Nunn, Nathan. 2009. "The Importance of History for Economic Development." NBER Working Paper 14899. Cambridge, MA: National Bureau of Economic Research.

Pastor, Manuel, and Chris Benner. 2008. "Been Down So Long: Weak-Market Cities and Regional Equity." In *Retooling for Growth*, edited by Richard M. McGahey and Jennifer S. Vey, pp. 89-118. Brookings.

Pendall, Rolf, Kathryn Foster, and Margaret Cowell,.2010. "Resilience and Regions: Building Understanding of the Metaphor." *Cambridge Journal of Regions, Economy and Society* 3: 1-14.

Rose, Adam, and Shu-Yi Liao. 2005. "Modeling Regional Economic Resilience to Disasters: A Computable General Equilibrium Analysis of Water Service Disruptions," *Journal of Regional Science* 45: 75-112.

Safford, Sean. 2009. *Why the Garden Club Couldn't Save Youngstown*. Cambridge: Harvard University Press.