

Coping with Adversity: Regional Economic Resilience and Public Policy

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Abstract

This paper, drawn from the book cited below, addresses the question of why some metropolitan area regional economies are resilient in the face of economic shocks and chronic distress while others are not. It is particularly concerned with what public policies make a difference in whether a region is resilient. To answer these questions it employs a wide range of techniques to examine the experience of all metropolitan area economies from 1978-2014. In addition *Coping with Adversity* looks more closely at six American metropolitan areas by conducting case studies to determine what strategies were employed, which of these contributed to regional economic resilience and which did not. Three of the regions studied are cases of economic resilience: Charlotte, NC, Seattle, WA, and Grand Forks, ND. Three are cases of economic nonresilience: Cleveland, OH, Hartford, CT, and Detroit, MI. In addition to containing hard data on employment, production, and demographics, each case contains material on public policies and actions that were obtained from site visits and interviews. The authors conclude that there is little that can be done in the short-term to counter economic shocks; most regions simply rebound naturally after a relatively short period of time. However, they do find that many regions have successfully emerged from periods of prolonged economic distress and that there are policies that can be applied to help them do so. *Coping with Adversity* will be important reading for all those concerned with local and regional economic development, including public officials, urban planners, and economic developers.

Introduction

Metropolitan economies sometimes experience economic adversity, with resulting serious impacts on the area's residents and institutions. The question the book¹, from which this paper is

¹ This paper summarizes work presented in Wolman, Harold; Wial, Howard; St. Clair, Travis; and Hill, Edward. 2017. *Coping with Adversity: Regional Economic Development and Public Policy*, Ithaca, NY: Cornell University Press. I would like to thank my co-authors as well as the MacArthur Foundation, which funded the research, and Margaret Weir, who served as director and co-ordinator of regional resilience network, under whose auspices the research was conducted.

drawn, addresses is why some regions are resilient in the face of economic adversity, while others are not? We focus on two different, though not necessarily unrelated, forms of regional economic adversity: adverse effects from sudden shocks to the regional economy and long-term regional economic stagnation or chronic distress.

Shocks, Chronic Economic Distress and Resilience: Conceptual Definitions

We begin by introducing and defining some terms critical to understanding of our work.

Economic Shocks: Economic shocks are exogenous events that have a sudden and immediate impact. They can be of various kinds and can be caused by a variety of factors, including national recessions that play out differentially on regional economies; sudden declines, either nationally or regionally in an export industry critical to a specific region's economy; the closure or re-location outside of the region of a major employer; natural disasters such as earthquakes, floods, or hurricanes; or other non-natural disasters such as terrorist attacks, chemical spills, or nuclear plant accidents.

Chronic Economic Distress: In contrast to a decline resulting from a sudden shock, a period of chronic economic distress is a long period of regional economic stagnation, slow growth, or decline. Chronic distress may be initiated by one or more of the kinds of sudden shocks described above from which the region is unable to recover, and which lead to economic stagnation or, through what Myrdal (1957) termed a process of cumulative causation, a long downward spiral. Negative cumulative causation is frequently described as a negative path dependency. But there may be other causes as well, such as long-term secular declines at the national level in industries that constitute an important part of a region's export base; technological or other changes that erode the region's competitive advantage in one or more of its prior export industries; the exhaustion or economic irrelevance of what was once a fundamental natural resource or location; the operations of the product cycle as industries that originate from region-based innovations ultimately expand elsewhere to take advantage of lower production costs; and/or a lack of the capacity to regenerate, or reload, its traded sector's portfolio of products through entrepreneurship, small firm creation, or other means as the product cycle for its once dominant industries plays out. Chronic distress may be characterized by low but stable growth (relative to the national growth rate) for long periods of time or by periods of continually declining or even, though rarely, negative economic growth.

Resilience: Resilience as an economic and development concept has been well theorized but poorly understood in practical terms. The virtue of the term is that it builds a sense of process into ideas of economic strength and weakness—i.e., a healthy economy is not uniformly strong but is one that responds well to external or internal shocks and so recovers rather than collapses.

What does resilience mean² in the context of a regional economy? For regional economic analysis, perhaps the most natural conceptual meaning of economic resilience is “bounce back,” 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 a 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 shock³. It does not necessarily mean that the composition of that output in terms of goods and services produced remains unchanged.

The recent economic geography literature has begun to incorporate the concept of resilience as adaptive capacity. Martin (2012: 14) defines this as “the capacity of a regional economy to reconfigure, that is to adapt its structures (firms, industries, technologies, and institutions), so as to maintain an acceptable growth path in output, employment and wealth over time. This view of resilience is thus quintessentially an evolutionary one: resilience is a dynamic process, not just a characteristic or property.”

Building upon this conceptual discussion, we define regional economic resilience in two different ways, depending upon the kind of economic adversity a regional economy faces. With respect to sudden *shocks*, we define resilience as the ability of the regional economy to either resist the shock or, if adversely affected, to “bounce back” to its prior growth path. Thus, a shock to a regional economy may have little or no adverse effect on the economy or it may have a more serious impact. If the shock has little or no adverse effect, we consider the region to be *shock-resistant* (which can be thought of as the strongest form of resilience). If the economy is adversely affected by the shock (i.e., the region is not shock-resistant), we consider it to be *resilient* if it bounces back to its original path within a moderate period of time. We consider the regional economy to be *non-resilient* if it does not bounce back within a moderate period of time...) A regional economy may bounce back either with little or no restructuring from its prior form or with substantial restructuring.

For *chronic distress*, our definition of resilience relates much more to the concept of adaptive resilience. Resilience in this context means the ability of the economy to emerge from a prolonged period of slow growth relative to the national economy and to experience sustained growth: can the economy adapt so that it emerges from its long-term path of slow growth to a higher rate of growth? Such adaptations frequently take the form of economic restructuring, i.e.,

² The term “resilience” has achieved widespread use as a means of characterizing successful responses to an increasing number of systemic shocks in a variety of fields. (See the Community and Regional Resilience Institute 2013 for a compendium of uses.)

³ See, for example, Blanchard and Katz 1992; Rose and Liao 2005; Briguglio et al. 2006; Feyrer, Sacerdote, and Stern 2007; Ormerod 2012; Fingleton, Garretsen, and Martin 2012. 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.

changes in the structure of the regional economy. Examples include changes in the composition of the region's export base (those industries that are the economic drivers of the regional economy), its industrial composition, its degree of industrial concentration or diversity, its ability to generate new firms (entrepreneurship), or the size distribution of its firms.

Adaptations may also occur in the factors that affect a regional economy's overall competitive advantage, such as changes in the skill levels of its labor force (through improved performance of its education and work force training institutions or through labor force migration), its business culture and willingness and ability to assist business, business-related public infrastructure, and amenities that attract a more skilled labor force.

Importantly, however, adaptation may take other forms not as directly related to the structure of the regional economy. Instead changes may occur in the characteristics and competencies of individual firms or clusters within the region – their production technologies; their reliance on capital relative to labor; the skills they require of their workers; their planning, marketing, research; and their development and production strategies. Another possibility is that the connectedness among firms and agencies and institutions such as universities, local industry associations, or specialized workforce providers becomes a source of competitive advantage (see Dawley, Pike, and Tomaney 2010).

Empirical Analysis: Methodology and Data

We employed both a quantitative analysis of a large number of regions and a set of intensive qualitative regional case studies. Our quantitative analyses describe and explain regional economic downturns, shock-resistance, and resilience after a downturn and after a period of chronic distress. Metropolitan areas in the United States constitute our unit of analysis. Our dataset includes all years from 1978 to 2013⁴. We present both descriptive data and regression based analysis designed to attempt to explain regional outcomes

Economic Shocks and Resilience

Operationalization of Concepts

Shocks can be of three kinds: 1) shocks to the regional economy 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* at either the *national* or the *regional* level), and 3) *other external shocks* (e.g., 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.

⁴ See Van Leuven et al. paper 'Resilience in the Face of Chronic Distress: U.S. Metropolitan Areas After the Great Recession,' presented at this conference for research methodology and results for 2007-2014.

Operational Definitions of Shocks and Their Impacts on Regional Economies: Our operational definition of a *national economic downturn shock* is a shock that results from a downturn in 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 (which is separately estimated for employment and gross metropolitan product—GMP) declines by more than 2.0 percentage points from its annual growth rate over the previous eight years.⁵

An *industry shock* is one that affects one or more of a region’s major export industries⁶. For a given year, we define a three-digit NAICS industry as a major export industry in a region if its share of regional employment⁷ is at least 1.0 percent *and* it is at least 80 percent above the same industry’s share of national employment.

We consider a region to suffer an industry shock when the job loss experienced by one of its major export industries in a particular year experiences a one-year annual decline of more than 0.75 percent of aggregate metropolitan employment. Our use of the term “shock” in this context thus refers to an inferred shock; we conclude that a shock occurred based on patterns in our data. Industry shocks can be either national (i.e., a shock to an industrial sector nationally) or a regional industrial shock (that is a shock that occurs to an industry in the metropolitan region but not the nationally).

- A *national industry shock* occurs if the three-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.
- A *regional industry shock* occurs if the three-digit industry that contributes the largest share of employment loss to the region’s export base when the region experiences an industry shock has *not* experienced a shock at the national level.⁸

A region’s economy can also experience non-economic shocks from natural disasters, terrorist attacks, or other non-economic events that have the potential to adversely affect the regional

⁵ The previous eight-year growth rate is measured by the slope of the regression line of the natural logarithm of employment on a time trend 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 (2004) use of an increase in the growth rate to measure growth accelerations.

⁶ 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.

⁷ We define shocks to gross metropolitan product (GMP) – regional economic output, analogous to national gross domestic product – in the same way as employment shocks, except we are using GMP data.

⁸ 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.

economy. However, as our data do not enable us to distinguish these shocks from others, we confine our discussion of shocks to economic shocks.

Operational definition of shock-resistant, resilience, and non-resilience: 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 metropolitan region is determined to be adversely affected by a shock if, in the *year of the shock or the year thereafter*, its economy experiences a substantial economic downturn, defined as a decline of more than 2 percentage points from the annual *regional* growth rate over the previous eight years⁹. If the region did not undergo a downturn in the year of the shock or the year thereafter, it is considered *shock-resistant*¹⁰ to that shock.

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. If it does not do so within four years, we term it *nonresilient*. (See figure 1.)

Empirical Results for Economic Shocks and Resilience

Descriptive results. In our empirical work, we identified nearly 1,500 employment shocks to U.S. metropolitan regions between 1978 and 2007. Regions were resistant to nearly half (47%) of these shocks, that is they did not experience a serious economic downturn because of them. When regions were adversely affected by the shocks, they were resilient 65% of the time—they returned to their previous growth path within a four-year period (See Table 1).

However, consistent with the literature, regions returned to their prior rates of employment and GMP growth more rapidly than they returned to their previous levels. They also returned to their prior rates of GMP growth more rapidly than to their prior rate of employment growth, suggesting that resilience to shock was led initially by productivity gains, with employment gains following later.

There was virtually no variation by Census Region in the extent to which metropolitan areas were resistant to instances of shock. There was modest variation in the degree to which once a metropolitan region was adversely affected they were resilient. When faced with employment shocks, metropolitan areas in the Northeast were resilient only 53% of the time compared to 71% of the time for southern MSAs (the national average was 65%). Much the same pattern held for GMP: there was virtually no variation in resistance to GMP shocks by Census Region, but of those MSAs adversely affected by a GMP shock those metropolitan areas located in the Northeast Census Region were less resilient (71% of the time) than the national average of 86%.

⁹ However, if the eight-year growth rate was 4% or higher, then the region's growth rate had to decline by more than half of the previous eight-year average growth rate. (This rule was put into place to identify only major slowdowns in the growth of booming metropolitan economies.)

¹⁰

We examined regional resilience to shocks in a series of cross-tabulations to see whether there were descriptive variances in the results controlling for a small number of potential explanatory variables: metropolitan area population size, manufacturing employment in 2000, and educational attainment, among others. (See Tables 2 and 3). Although some of the differences reported are statistically significant they are simply bivariate descriptive relationships *not* controlling for other factors. In fact, several of these relationships are not statistically significant in the more fully specified multivariate models on which we report in the next section.

While metropolitan regions as a whole were shock-resistant to employment shocks 53% of the time, the sixty-nine largest regions (over 1,000,000 in population) were resistant to employment shocks only 23% of the time. These large metropolitan regions were also less likely to be resilient to those shocks that adversely affected them (50% compared to 65% of all regions).

Our simple comparisons show only limited evidence that metropolitan regions with common characteristics were more predisposed to suffer shock-induced economic downturns than other areas. The one statistically significant difference between regions that had three or more employment downturns and those that had fewer was in the proportion of employment in manufacturing in 2000. Manufacturing accounted for a 3.1-percentage-point higher share of total employment in regions experiencing at least three more employment downturns than in regions with fewer downturns. For shocks affecting GMP, regions experiencing three or more GMP downturns had a manufacturing employment share that averaged 2.2 percentage points more than regions with fewer downturns and had a 1.9 percentage-points higher share of population with a high school education or less, fewer research institutions, and a lower population. (All of these differences were statistically significant.)

We also identified differences among regions that were resilient to *all* shock-induced downturns compared to those that were non-resilient to one or more downturns. With respect to employment downturns, resilient (to all shock-induced downturns) regions averaged a 5.1-percentage-point higher share of their adult population with education above a high school diploma, a 3.6-percentage-points higher share of Hispanics in their population, a relatively small metropolitan area population, and fewer research institutions compared to those regions that were non-resilient to one or more downturns.

Existing research suggests that regions that lost either employment or GMP return to their *prior rates* of growth much more rapidly than they return to their *prior levels* of employment or GMP. We find that 75% of regions that were adversely affected by a shock actually lost employment relative to their base year (i.e., the year prior to its first year of economic downturn) during some period of one or more years following the shock, while 61% experienced a loss of GMP. Of those that did lose employment, the average amount of time it took to return to pre-shock employment levels was 5.6 years, with a maximum of twenty-nine years, while the mean time to return to prior GMP levels was 3.5 years.

For regions that were resilient (all of which, by our definition, returned to their prior *rate* of growth within four years), the average number of years needed to return to prior employment *levels* was 5.1 and the average number of years required to return to prior GMP levels was 3.5 years. For non-resilient regions that lost employment and/or GMP, the average amount of time needed to return to pre-shock employment levels was 6.7 years and to pre-shock GMP levels was 4.0 years.

Some regions took much longer. For instance, the Hartford metropolitan area experienced a downturn in 1988 to which it was non-resilient. Twenty years later, employment in the region had yet to return to its 1988 level. New Orleans suffered a downturn in 1981 in tandem with the national economic downturn and did not return to its prior level of employment until 1994.

Resilient regions returned to their prior *rates* of employment and GMP growth relatively quickly (the average time was 2.9 years for employment shocks and 2.4 years for GMP shocks), but for those regions that lost employment and/or GMP, the time to return to prior *levels* was longer, much longer. Furthermore the return to prior GMP levels was considerably more rapid than the return to prior employment levels, indicating that the recovery to a shock was led by increased productivity with additional employment following in its wake.

We now turn to questions related to why. Why were some regions resistant to shocks while others were adversely affected by them? Why were some adversely affected regions resilient while others were not?

*Model Results: Explaining Shock Resistance, resilience, and time to recovery.*¹¹ In the book we present empirical models explaining resistance to shock, resilience (versus non-resilience) after having experiencing adverse effects of shock, and time taken to attain resilient status. The data for our models consist of total employment from 1970 through 2007 and gross metropolitan product (GMP) from 1978 through 2007 for the 361 metropolitan statistical areas in the United States¹². Since our definition of an economic downturn requires eight prior years of employment data, the years available for analysis are limited to the thirty years from 1978 through 2007 for total employment and twenty-two years from 1986 through 2007 for GMP.

The dependent variable in each case was a dummy variable taking the value of 1 when the event of interest took place in a given year and a value of 0 when it did not. The dependent variable thus represents resistance to a shock, resilience after having experienced the adverse effects of a shock, or length of time to recovery, depending on the intent of the model.

¹¹ The models are set forth in chapter 1 of Wolman et al. (2017). They include a hazard model to explain the occurrence of regional economic downturns, a logistic regression model to explain shock resistance, another logistic regression model to explain resilience of regions that experienced a shock-induced economic downturn, and a hazard model to explain length of time to resilience for those regions that were resilient

¹² Because the Office of Management and Budget has changed its definition of metropolitan areas over time, we aggregated our data from the county-level where necessary to ensure consistency. The metropolitan area definitions that we use are from 2003.

Based on our review of the literature, we employed 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 are expected be related to shock-resistance and/or resilience. These variables included characteristics of the regional economy such as economic structure (the percentages of regional employment that are in selected industries that either are part of an region's economic base) or are rapidly growing due to structural shifts in the economy nationally (health care and social assistance), measures of industrial diversification, and area wage rates.

To examine the effect of labor force and labor market institutions, we included an educational attainment variable – the percentage of the population aged twenty-five and older who possess no more than a high school diploma – to assess whether areas with a higher proportion of less educated residents are likely to be more susceptible to economic downturns and less resilient in terms of recovery. We also included the percentages of the population that are non-Hispanic black and Hispanic, respectively.¹³ As an indicator of labor market flexibility, we included a variable for whether the region is wholly or predominantly in a state that has a right-to-work law.

We also included background characteristics of metropolitan areas that might affect shock-resistance and/or resilience. To determine whether the size of a region's economy matters to its performance (and also to standardize other variables for size differences), we included a lagged employment variable (lagged GMP in the case of the GMP models). Because some literature argues that income inequality makes flexible regional responses more difficult we include the ratio of the income of each region's high-income households (defined as those at the 80th percentile of the metropolitan area's income distribution) to that of its low-income households (defined as those at the 20th percentile).

We also included variables capturing the three different kinds of shocks (national economic downturn shock, national industry shock, and regional 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 Census region, we include dummy 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. The models and tables presenting their results are all presented fully in the book.

The story our analysis told was more complex than the findings in previous research on regional economic growth. We find, for example, that some characteristics make regions less susceptible to shocks, but also make it more difficult for them to recover once a shock takes hold of a regional economy. While the importance of human capital to long-term economic growth is a consistent finding in the regional economic growth literature, our findings show that when facing a shock, regions with a poorly educated population are more likely to suffer from an employment

¹³ For those demographic variables that we obtained from Census data, we applied linear interpolation to gather estimates for non-census years.

downturn but are also more likely to be resilient in recovering from such a downturn. Our findings tell a similar story with respect to industrial structure. A high percentage of employment in the manufacturing sector makes it more likely that a region will suffer from an employment downturn as a result of a shock but more likely that it will quickly recover (see Table 4). We attribute these findings to the difference between shocks that are purely cyclical compared to shocks that disrupt the competitive structure of a region's economy. Cyclical shocks are more common than structural shocks. Cyclical shocks allow a region's economy to rebound to its pre-shock product portfolio, while recovery from structural shock typically requires new products to be added to that portfolio.

We also found that right-to-work laws, which we use as a crude proxy for labor market flexibility, were positively related to regional resilience to both employment and GMP shocks. Income inequality presented particularly complex results. High income inequality made a region *less* likely to have its GMP adversely affected by a shock, but *more* likely to be resilient and to return to its prior growth rate more rapidly. At the same time it made regions *less* likely to be resilient in terms of employment.

Chronic Economic Distress and Resilience:

Operationalization of Concepts

We define chronic economic distress and resilience in terms of regeneration and recovery. Chronically distressed regions are regions that experience prolonged periods of slow-growth or decline relative to the national economy. These may be “lagging” regions that suffer from inadequate infrastructure or low human capital. Or they may be regions that were once prosperous, but have declined as a result of changes in external demand, shifts in their competitive and comparative advantage, or the maturation of the product cycle of its main export(s). Some of these once prosperous regions are able to “reload” the product portfolios of their traded sectors and regain prosperity after a period of slow growth, while others experience a more severe and prolonged period of relative decline.

Operational Definition of Chronic Stress and Resilience (or, as it is often termed, Recovery):

Operationally, we define a chronically distressed region as follows: In a given year, a region is growing slowly if its growth rate over the previous eight years is less than 50% of the national eight-year growth rate and at least one percentage point less than the national growth rate. A region (again, we are using OMB Metropolitan Statistical Areas to define a region) is chronically distressed if it meets this criterion for seven consecutive years; that is, its eight-year growth rate is less than 50% of the national eight-year growth rate and at least one percentage point less than the national growth rate for seven consecutive years.

We distinguish between chronically distressed regions that never see any period of recovery and those chronically distressed regions that do recover from chronic low-growth (we call these regions resilient to chronic distress). We define recovery in this context as occurring when a formerly chronically distressed region's eight-year annual growth-rate reaches 75% or within 0.5 percentage points of the nation's eight-year annual growth rate and remains at that level for a period of seven consecutive years.

Empirical Results for Chronic Distress and Resilience

We employed the same data set for our chronic distress and resilience analysis as we did for the economic shock and resilience.

Descriptive results: Of the 108 instances of chronic regional economic distress in employment in our data set, twenty of the instances occurred within four years of a shock to which the region was not shock-resilient and to which it was also not resilient within the four year period. In other words, in these cases, a shock occurred directly prior to the onset of a period of chronic distress and quite likely led to it. In an additional eleven cases, the onset of chronic economic distress occurred during the fifth year after the onset of a shock to which the region was not resilient.

A total of forty-two (47%) of the eighty-nine metropolitan areas that experienced at least one spell of chronic distress with respect to employment growth saw a period of recovery within the timeframe of our dataset.¹⁴ Thus, for many regions chronic distress, while posing serious economic hardship, nonetheless does not last forever (see Table 5).

There were considerable regional differences in terms of the number of chronically distressed regions as well as the percentage of chronically distressed regions that showed recovery. Over half of the metropolitan regions in our sample falling in the Northeast meet the criteria for being chronically distressed with respect to employment growth (38% meet the GMP criteria). This is substantially higher than any other region, with the Midwest being the second most affected at 37 percent. The Midwest has the largest *number* of chronically distressed regions in terms of employment (33), while the South has the largest number of chronically distressed regions in terms of GMP (37). (See table 5.)

We next provide descriptive statistics that highlight some of the differences in averages for specific variables between both chronically distressed metropolitan areas and all other metropolitan areas in Table 6 and differences between chronically distressed metropolitan areas that showed recovery and chronically distressed regions that did not show recovery in Table 7.

¹⁴ It is important to note that regions that experienced slow-growth near the tail end of our dataset will be unable to see recovery within the time frame of study. We account for this in our longitudinal regressions by removing 2002-2007 as years of observation.

The most striking take-away from Table 6 is that there appear to be considerable differences between chronically distressed regions and healthy regions in a number of key categories. Chronically distressed regions appear to be less well educated (53.9 percent of the adult population with a high school education or less vs. 47.4 percent) and less populous (with a median population of 163,000 versus 238,000). Chronically distressed regions also had a higher percentage of their employment in manufacturing, lower average populations (implying fewer opportunities to develop agglomeration economies), and greater industrial diversity. They were also less likely to be in right-to-work states. Although each of these differences in mean values discussed above is statistically significant, they do not control for the influence of other variables as we do in a later section of the paper.

In contrast to Table 6, Table 7 finds fewer differences between chronically distressed regions that recovered and those that did not, though more differences reveal themselves in the GMP data (for example, as the percent of the population employed in manufacturing in chronically distressed regions increased, the regions were less likely to recover, while as the average July temperature increased and if the state had a right-to-work law, chronically distressed regions were more likely to recover.) Meanwhile, the only variable that attains statistical significance in the employment data is the percent of the population that was Hispanic in 2000. Chronically distressed regions that recovered had a Hispanic population (10.07 percent of the total) that was much larger as a percentage than regions that did not recover (3.99 percent). As with many of the variables, it is difficult to infer the direction of causality, but we theorize that it is likely that growing regions attract a greater number of immigrants.

Of the instances of chronic distress, there were sixty-three cases (out of a total of 108) in which a region actually lost employment during the first year that it entered the category of chronically distressed. The average time it took to return to the prior level of employment was 9.1 years, but for some regions a return to prior levels took much longer; in a few cases, it has not yet occurred. Both Anderson, IN, and Danville, IL, suffered declines in employment throughout almost the entire period of study, losing 25% and 22% of jobs, respectively, over the period 1978 to 2007.

Model Results: Explaining Chronic Economic Distress, resilience, and time to recovery.

In the book we also include explanatory models for experiencing chronic distress and for recovering from it.¹⁵ These models throw light both upon why regions experience chronic distress and why some of these regions are resilient, i.e., they are able to emerge from that condition. The independent variables are essentially the same as for our analysis of shocks with a small number of adaptations.

¹⁵ The models are set forth in chapter 2 of Wolman et al. (2017). They include a cross-sectional logit models and a longitudinal hazard model to explain the occurrence of chronic distress, a cross-sectional logit model to explain why some chronically distressed regions were able to recover, and a hazard model to explain the time to recovery for those chronically distressed regions that did recover.

Briefly summarizing the results (see Table 8), we found that regional chronic economic distress in terms of both employment and output was associated with low educational attainment in the region at the onset of the event. The results for educational attainment conform to previous conclusions about the importance of worker skills in the U.S. economy. Chronic distress is associated with low educational attainment in a region at the onset for both employment and output. Factor cost explanations also received support. Controlling for regional industrial composition, high wages per worker were associated with the onset of chronic-distress. Manufacturing's share of regional employment was also important and statistically significant as a predictor of chronic economic distress, but in a way that confounds popular perceptions. Regions with a high percentage of their employment in manufacturing were less likely to enter a period of chronic GMP economic distress. This may reflect the late product cycle stages or low productivity that may have characterized the kinds of manufacturing firms found in chronically distressed regions in the late 20th and early 21st centuries rather than any adverse economic impact of manufacturing *per se*.

However, the determinants of emergence from chronic economic distress were not always the converse of those that predisposed regions to entering a period of chronic economic distress. For regions that experienced chronic distress, those with a higher proportion of their employment in manufacturing were *less* likely to emerge (be resilient) from GMP distress, but were more likely to be resilient from employment distress (i.e., return to rates of total employment growth near to, or above, the national rate). The stickiness of high wages mattered as well: the longer high wages relative to other areas persisted, the longer it took a region to emerge from chronic distress. Income inequality appeared to predispose a region to chronic distress, but it was also positively associated with recovery – the greater the extent of income inequality the more likely a region was to be resilient to both employment and GMP chronic distress. The reason for this result lies in the operation of the labor market. And the number of major export industries, while not a factor in preventing a period of chronic distress, was positively related to resilience from GMP chronic distress.

Our measures of economic diversity (number of major export industries and the Herfindahl index) were unrelated to whether a region experienced chronic distress. However, for those regions that were chronically distressed, the number of major export industries was positively related to resilience from that condition, while the degree of industrial concentration in regional economies was negatively related to the amount of time it took to exit chronic distress.

Income inequality, in the form of a large gap between workers at the eightieth percentile and workers at the twentieth percentile of the earnings distribution is positively associated with the onset of chronic distress. However, it also appears to be positively associated with recovery.

Regional Policy Responses to Adversity: Case Studies

The quantitative analyses described above do not provide information on the processes that occurred or on the nature and effects of interventions or changes of behavior. To provide a richer understanding of economic shock and resilience we undertook intensive case studies in six metropolitan regions: Charlotte, Cleveland, Detroit, Grand Forks, Hartford, and Seattle (see Wolman et al., 2017, chapters 3 & 4). We chose these regions to reflect adversity as a result of economic shocks and chronic distress as well as differences in resilience outcomes. In three cases (Cleveland, Detroit, and Hartford), the regions were less resilient, while in three other cases (Charlotte, Grand Forks and Seattle) the regions were resilient. While we make no claim that these six regions are a representative slice of metropolitan regions nationally, they do vary in the kinds of economic adversity that they have experienced and in their responses.

The six regions encompass a range of different kinds of economic problems over the nearly four decades of our study. However, we found little difference among the six regions in their activities during good times and bad. Nor were there any obvious differences between the economic development activities of those regions that avoided shocks and chronic distress and the normal practice of economic development in the other regions. Our case studies failed to find any public policies put in place during the shock period that affected whether a region recovered from a shock or how long it took to do so. This is not surprising, given that most of the shocks consisted of regional cyclical fluctuations where downswings were simply followed by upswings, or, from the perspective of one of our interviewees, the region's policy strategy was "to hold our breath until the economy recovered."

Strategies and policies that were put in place in the case study regions were sometimes motivated by shocks but were mainly longer-term efforts that could not have been expected to prevent shocks or cushion their negative impacts. These included marketing and recruiting; the creation and restructuring of economic development organizations to encompass more of a regional development perspective and with greater participation of universities, hospitals, and foundations in the region's economy; industry targeting and cluster policy; workforce development; entrepreneurship, small firm start-up, and firm assistance programs; and amenity strategies such as downtown development.

Evaluating the Responses by Regional Actors:

Did these intentional efforts to bring about recovery through public policy or civic action make a difference or were they merely symbolic window-dressing derived from a mistaken, though understandable, belief that public officials and civic actors have some ability to affect their regional and/or local economies? We did not attempt to rigorously evaluate the effects of the policies, strategies, and tools that were brought to bear in each of the regions, nor would it

have been practical to have done so. Furthermore, many of these policies were longer-term efforts and would likely not show results in the shorter time frame we examined.

Instead we focused on the likely effects of the various policies and engaged in a variety of efforts to determine their impacts. First, we set forth and discussed the logic underlying the policy, i.e., why and under what circumstances the policy might be (or might not be) expected to have an effect on regional economic resilience or development. We then summarized the existing research literature that evaluates the specific policies and over what time frames they are likely to occur. From these efforts we came to what we believe is an informed assessment of the likely effects of the various responses (see Wolman et al., 2017, chapters 5 & 6).

Our examination of the various strategies applied by regional actors as they attempted to respond to economic shocks and to emerge from chronic economic distress did not yield any magic bullets. The strategies differed both in terms of likely effectiveness, and, the time frame over which they were likely to have an impact. We were able to identify more strategies that were likely to be effective in the long term, as responses to chronic economic stress, than in the short term, as responses to shock.

Responses to shocks: None of the strategies appeared to have a sufficiently large impact in the short term to have an identifiable effect on successful recovery from an economic shock¹⁶. Short-term outcomes in regional economies are principally determined by demand conditions in the markets for the traded, or export, products and services currently produced in the regional economy. In the short run the supply and quality of the factors of production are inelastic and the demand side of the market for the factors of production is derived from demand for the region's portfolio of export, or traded, goods and services. Consequently, most local policies designed to increase regional employment and income either take too long to put in place or too long to have an impact (or both) to make a difference in the short-term. While there are a few exceptions (such as infrastructure spending and increases in public employment), they are difficult to put in place without federal or state assistance.

Rather than economic development policies, the most important local policies to have in place as a short-term response to shocks are 1) a social safety net that will be able to protect residents and serve as an automatic stabilizer to dampen the downturns that often result from economic shocks

¹⁶ Public works infrastructure spending as a means of providing construction spending is an exception, since this will provide both construction-related employment and income, much of which will accrue to residents of the region. Such a policy requires either reprogramming future planned spending for which funds are available into the present or raising new funds through bond sales, which in many states requires citizen approval through a referendum.

and 2) a budgetary rainy day fund that will mitigate the need for sharp reductions in important local public services. These types of pre-shock planning should in principle be possible.

Responses to chronic distress: Long-term chronic economic distress, sometimes triggered by economic shocks, is a different matter. Our review of the empirical literature evaluating the various strategies and policies, combined with our own analysis of the logic undergirding the various strategies, suggests that many of them may have a positive effect in the medium- and longer-term and thus can play a role in assisting regions coping with chronic distress. In particular, human capital strategies – such as improvements in the pre-school, elementary, secondary, and community college formal education systems – can play an important role in improving an area’s labor force skills and thus contributing to an area’s economic growth. Although the literature also suggests that another human capital approach - “second chance” workforce training programs – does have positive effects, these effects are likely to be more modest and in any case are likely to occur only in the context of economic growth; they are unlikely to stimulate growth. Investment or reinvestment in major components of the region’s public infrastructure (airports, bridges, transshipment facilities), particularly if the areas public infrastructure is lacking or of a low quality to start with, can also have a major impact. Firm technical assistance programs, programs directed toward stimulating entrepreneurship, and possibly state-level tax incentives, if *well-thought out and constructed*, show evidence of being able to yield positive, though modest, effects .

Some of the “strategies” that have received the most attention seem to hold less promise. There is little evidence that amenity improvement strategies on their own actually “work” as an economic development tool, despite the existence of a logic that, under certain circumstances, seems sound. At best, amenity strategies may be necessary for the growth of particular industries in particular places (e.g., the banking industry in Charlotte), and that amenities may be an important contributor to regional economic growth in some of those places (as it was in Charlotte). However, amenity strategies are not a universal recipe for sustained economic growth.

One of the most frequent prescriptions we heard as a lever for improving regional economies was the need for improved “leadership.” Unfortunately, we find this prescription nearly useless in application. Good leadership is almost certainly contextual; leadership qualities necessary for one kind of situation will differ from another kind. We have even seen evidence that the leadership necessary for dealing with an economic shock is different from that that successfully deals with chronic distress, so that a “good” leader for one situation might be a “bad” leader in another. Not only do we not know the particular characteristics necessary for good leadership, we are unlikely to know how to produce them even if we could identify them. And under almost any conception, leadership without sufficient resources is likely to yield disappointing results. Although we believe good leadership is important – perhaps even vital – for economic

revitalization, we do not think the constant repetition of its need or importance is going to produce it.

Economic Development Policy Impacts in a Temporal Framework

The puzzle that we set out to solve is why some regions are resilient in the face of economic adversity, while others are not. To address that puzzle we conducted research to explore the extent to which economic regions are indeed resilient in the face of adversity; the ways in which they are resilient, and the factors that underlie their resilience. We considered two different, though sometimes related, forms of economic adversity: shocks to regional (metropolitan) economies and long term chronic economic stress.

We also tried to examine and assess strategies that regions have employed in an effort to be resilient. Can intentional local public actions and policies help regional economies to recover from economic adversity? If the answer is yes, such strategies and policies could then become part of intentional economic development planning and practice at the regional level.

It is first important to set the question of the effect of intentional local and regional strategy and public policy on economic adversity in context. A metropolitan area economy consists primarily of private firms that exist in a market economy and compete in regional, national, and/or international markets. The strategic decisions made by important individual firms in the area, along with the ability of entrepreneurs to create successful new firms there, are the primary factors in determining a region's economic resilience or lack thereof. Individual firm decisions with respect to the introduction of new products, markets, technologies, marketing strategies, and so on, that either position firms for success in a changing economic environment or make failure more likely, are therefore critical. The aggregate of these private sector decisions by businesses in the region plays the major role in determining area resilience. Public policies, including fiscal, monetary, tax, subsidy, and regulatory policies, among others, can have large impacts on those decisions. Local and regional economic development policies are less important.

This does not mean that intentional public economic development policies and actions at the local and regional levels have no effect. Indeed, if money and time currently spent on public sector or quasi-public sector economic development activities reveals the beliefs of government and business leaders alike, then the answer to the question of whether such policies have an important effect is a resounding yes. Intentional economic development policies, planning, marketing, and investments are perceived to generate net benefits for a region. The extent to which these are truly net economic benefits, although highly contested, is not known. However, the evidence that we reviewed gives us pause and leads to a much more nuanced and cautious set of conclusions about the extent to which local or regional economic development activities can help regions recover from economic shocks or long-term stagnation.

Our results show that in most cases metropolitan regional economies recover from shocks within a relatively short period of time, regardless of whether any explicit economic development policies are put in place to help them do so. But there are enough cases of regions stuck in Myrdal-like negative path dependencies to pay attention to the importance of economic development policy as a means of promoting regional economic recovery.

A Temporal Model of Economic Development Policy:

Within that context, what can we expect of explicit economic development policies as contributors to resilience? To address that question, we developed and utilized a temporal framework for assessing the effect of economic development activities (see Wolman et al. 2017, conclusion). Economic development policy is usually envisioned as a time-undifferentiated menu of approaches, policies, tools, or practices from which economic development policy makers and practitioners choose the mix appropriate to their situation. Evaluation of these actions, however, often ignores the time frame in which they are set. There are two time dimensions to this framework: implementation and impact.

The amount of time required to put different policies into a place will vary depending on legal changes that need to be undertaken, funding cycles, the number of jurisdictions and levels of government required to approve the policy, and the difficulty of building the program and the delivery team. Some policies, such as tax credit programs, may be put in place relatively quickly, even if their effect may not be felt for a substantial period of time. Other policies may take years to implement, though, once in place, their impact might—or might not be—nearly immediate (e.g., training programs).

The second dimension is time needed before the policy can either change the quality of a regional economic resource (such as the quality of labor or infrastructure) or affect the behavior of firms (such as a process or product innovation program). Policy effects are not instantaneous. In assessing policies, it is critical to do so within the time frame for which they can reasonably be expected to have a noticeable and significant impact.

This poses three critical distinct questions for policy makers facing economic shocks or chronic distress: (1) is the program expected to make a difference in economic performance? If there is no expectation that the program will make a difference, then putting it in place is a political or symbolic act though it may have economic or fiscal consequences; (2) when should the program be put in place; and (3), how long will it take for that program to have an impact?

We set forth a framework consisting of three time periods for examining economic development policies and their likely impact during each of these periods. Specific policies can be expected to have an effect within each of these time frames.

In the *short term* the economic development activity that can be expected to have an impact, assuming the activity is effective, is limited mostly to managing, marketing, and increasing the

utilization of the area's current factors of production, or what economic development practitioners frequently call assets or critical location factors—the current stock of labor, real estate, infrastructure, water, and access to customers and suppliers that are central to a firm's location or expansion decision. One focus of the near term is on transactions. An economic development policy or practice could help with the retention or expansion of existing firms and with marketing the area. Many of the activities revolve around providing information about the region's development assets and then lowering the risks and costs of engaging with the local development process, such as permitting, site approvals, utility hookups, and transportation access. A second focus of the near term is on promoting the full utilization of the region's assets, especially unemployed workers, by expanding the demand for the goods and services those assets produce. This generally involves increasing government purchases of goods and services, particularly through spending on infrastructure.

In the *intermediate term* programs and policies designed to improve the competitiveness of the region's existing firms and portfolio of products could be expected to have an effect. These include increasing research and development, increasing qualified workers through technical training through the community college system and vocational training programs, establishing cluster associations and relationships, and technical assistance around process and product innovation. Other activities include improving the quality and cost of transportation infrastructure and energy systems. If near-term activities are focused on selling a region's current stock of assets—land, labor, and infrastructure, then the intermediate term activities should result in improving the cost and quality of its stock of land, labor and infrastructure.

For the *long-term*, investments in education and major infrastructure components would be expected to have an impact as would the overall quality of public services and the efficiency with which they are delivered. Over the long run education, training, and infrastructure dominate the policy agenda.

Policies towards Shock and Chronic Distress in a Temporal Framework

What does this temporal framework imply for policies in response to economic shocks and chronic economic distress respectively?

Shocks and Short-Term Responses: As previously noted, short-term outcomes in regional economies are principally determined by demand conditions in the markets for the traded, or export, products and services currently produced in the regional economy. Rather than economic development policies, the most important local policies to have in place as a short-term response to shocks are a social safety net that will be able to protect residents and serve as an automatic stabilizer to dampen the downturns that often result from economic shocks and a budgetary rainy day fund that will mitigate the need for sharp reductions in important local public services.

Our findings indicate that some types of regions are more prone to experience shocks and their adverse effects than others. In particular, regions that have high rates of manufacturing

employment, lower levels of worker educational attainment, and less economic diversity are more at risk. Policymakers and planners in these types of regions should be particularly alert to the need to have adequate social and budgetary social nets in place. In addition, since our analysis indicates that regional economies that are more diverse are more likely to be shock-resistant, this suggests that prior strategies or policies that result in successful diversification have some protective value as a shield against the potential adverse impacts of shocks. However, that simply pushes the question back further—what kinds of policies will successfully result in economic diversification.

Chronic Economic Distress and Medium-Term Policies: Long-term chronic economic distress, sometimes triggered by economic shocks, is a different matter. As time passes and it becomes possible to change and improve the stock of factors that serve as economic development assets, the factor markets dominate the development path as the supply of assets becomes more elastic. Here public policy—particularly human capital and infrastructure investment policy—can play an important role in shaping a region’s economic future.

We found that the regions most at risk for entering periods of chronic economic distress are those with high levels of manufacturing employment, low levels of worker skills, and high wages. These findings need to be interpreted with care. They do not imply that manufacturing or high wages per se cause chronic distress. Rather, regions with a high manufacturing presence and high wages in the last two or three decades of the twentieth century were often chronically distressed because they had cost structures that were uncompetitive and product portfolios dominated by old manufactured products with slow-growing product markets and diminishing margins¹⁷.

Similarly, high wages per se are not a problem. To the extent that labor costs matter for regional competitiveness (something that varies depending on the labor-intensity of the region’s major export industries and the availability of lower wage alternative locations for those industries), they depend not on wages alone but on wages relative to productivity. There are two ways to solve a regional wage-competitiveness problem: by lowering wages or by raising productivity.

The dynamics of the product cycle often play a critical role in regional economic change. This may be because, as in Detroit or Charlotte, the region’s traded, or export, sector is dominated by a single industry. In such regions, the dynamics of the dominant export industry largely determine the medium-term. Or it may be because, as in Cleveland, a portfolio of regional export products may be in different industries but have similar economic ages. This means that they move through the same phases of their product cycles at the same time. As those products move

¹⁷ Regions such as Seattle, where manufacturing was important and also characterized by product innovation, did not become chronically distressed during our study period, and manufacturing-based regions where companies continue to produce new products are not likely to become chronically distressed in the future.

from development to maturation and routinization, employment in their industries declines in the region and increases in areas with more competitive factors suited for routinized production.

In terms of the product cycle, successful regions are those that 1) are diversified (i.e., have a variety of products in various industries that are in different stages of the product cycle) and/or 2) are able to continue to regenerate through developing new products in the same or new industries (think Silicon Valley, New York, Boston, or Seattle). Unsuccessful regions enter a period of chronic economic distress when their portfolios become unbalanced and dominated by old products—no matter how technologically sophisticated or capital intensive.

The above discussion suggests that chronically distressed regions need to regenerate through diversification, entrepreneurship, and innovation. But these are more aspirations than strategies or policies. In our review we found that some policies presumably designed to achieve these results (cluster policies, entrepreneurship assistance, small business technical assistance, and the like) have some potential but that potential is either limited or extremely difficult to execute. At the heart of a region that has experienced chronic economic distress are problems that relate fundamentally to its assets and, in particular its human capital assets.

Chronic Economic Distress and Long-Term Policies: Policy efforts to improve the region's assets in the long run can play a critical role in changing the trajectory of a regional economy. Our review of the literature strongly indicates that human capital strategies—particularly improvements in the preschool, elementary, secondary, and community college formal education systems—can play an important role in improving an area's labor force skills and thus contributing to an area's economic growth.

But the task of improving an area's human capital assets is not simply one of imparting higher levels of skills. Particularly in previously dominant manufacturing regions like Detroit and Cleveland, it may also require changes in expectations and attitudes. In chronically distressed regions, the region's labor market has seen its implicit social contract torn up, but a new one such as exists in the Scandinavian countries has not been put in place to provide benefits and protection for workers as well as for businesses and investors. What was once expected in terms of earnings, benefits, employment stability, career ladders, and political behaviors can no longer be sustained. This all too often means that workers, investors, and institutions sit back and wait for their traditional economic base to kick back into gear or they frantically attempt to reestablish the position of their traditional employers through political means. Trying to reestablish the jobs that they are trained for and to maintain the social contracts that they have come to expect is understandable, though almost certainly futile. Existing worker training and retraining programs provide limited assistance for the current lower skilled generation of workers unless the economy has already entered a growth phase. Under these circumstances, improvements in the performance of the formal education and training institutions for those currently engaged in them provides the best avenue for emerging from chronic economic distress and for long-term economic growth.

Tables

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

		Regional outcome of shocks resulting in downturns				
	Total number of shocks	Number of shocks that did not result in downturn	Number of shocks that resulted in downturn	Region was resilient	Region was non-resilient	Average time to recovery for resilient regions
Total shocks	1,476 (100%)	701 (47%)	775 (53%)	507 (65%)	268 (35%)	2.9 years

Table 2 Means of Shock-Resistant Metropolitan Areas versus All Other Metropolitan Areas

	Employment			GMP		
	Metropolitan areas that experienced fewer than three downturns	Metropolitan areas that experienced three or more downturns	Difference	Metropolitan areas that experienced fewer than three downturns	Metropolitan areas that experienced three or more downturns	Difference
Percent employment in manufacturing (2000)	11.3	14.4	-3.1***	12.5	14.7	-2.2***
Number of major export industries (2000)	4.86	5.05	-0.19	6.63	6.89	-0.27
Percent of population 25+ with a high school education or less (2000)	48.8	49.1	-0.3	48.0	50.0	-1.9**
Percent Hispanic (2000)	9.51	9.26	0.24	9.83	8.81	1.02
Average July temperature	76.3	75.9	0.4	75.7	76.2	-0.5
Right-to-work state (2000)	0.44	0.46	-0.02	0.42	0.49	-0.07
Herfindahl index	4.24	4.66	-0.41	4.35	4.76	-0.40
Number of research institutions	0.59	0.48	0.12	0.69	0.32	0.37***
Distance to large metro	2.13	1.63	0.50	1.63	1.88	0.25
Population (2000) - Medians	207,355	226,522	-19,167	288,309	181,269	107,040***

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 3. Means of Resilient Metropolitan areas versus All Other Metropolitan areas

	Employment			GMP		
	Metropolitan areas that were resilient to all downturns	All Other Metropolitan areas	Difference	Metropolitan areas that were resilient to all downturns	All Other Metropolitan areas	Difference
Percent employment in manufacturing (2000)	14.3	13.3	0.9	14.2	12.6	1.6*
Number of major export industries (2000)	5.22	4.93	0.30	7.08	6.23	0.86***
Percent of population 25+ with a high school education or less (2000)	52.8	47.7	5.1***	50.2	47.1	3.1***
Percent Hispanic (2000)	12.0	8.4	3.6**	9.78	8.58	1.20
Average July temperature	77.6	75.4	2.1***	76.3	75.4	0.92
Right-to-work state (2000)	0.52	0.43	0.08	0.48	0.41	0.07
Herfindahl index	5.23	4.32	0.91	4.72	4.28	0.44
Number of research institutions	0.21	0.60	-0.39***	0.29	0.86	0.57***
Distance to large metro	2.03	1.67	0.36	2.03	1.31	0.72***
Population (2000) - Medians	160,026	251,494	-91,468***	180,936	341,851	-160,915

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 4**Regression Results: Determinants of Shock-Resistance and Resilience**

	Did shock result in downturn		Was region resilient to downturn	
	Employment	GMP	Employment	GMP
Low educational attainment	+	+	+	0
Earnings per job	+	0	0	0
Percent employed in durable manufacturing	+	0	+	0
Percent employed in nondurable manufacturing	+	0	-	0
Percent of employment in health care and social assistance	0	0	-	-
Percent employed in tourism-related industries	0	0	0	0
Economic diversity	-	0	0	0
Economic concentration	+	0	0	0
Prior 8 year growth rate	+	+	-	-
Number of research universities	0	0	0	0
Right-to-work	0	0	+	+
Percent Black	+	0	0	-
Percent Hispanic	0	0	0	0
High income inequality	0	+	-	+

Plus sign (+) indicates a positive impact that is substantively significant (with at least a 1 percentage point change) and statistically significant (at the 10% level or better); minus sign (-) indicates a negative impact that is substantively significant and statistically significant; zero (0) indicates an impact that is not statistically significant or, if statistically significant, not substantively important.

Table 5**Regional Differences in Chronic Distress and Recovery**

Employment					
Region	Number of metropolitan areas in each region	Number of chronically distressed metropolitan areas	Percent of metropolitan areas chronically distressed	Number of chronically distressed metropolitan areas that recovered	Percentage of chronically distressed metropolitan areas that recovered
Northeast	45	27	60%	8	30%
Midwest	90	33	37%	19	58%
South	147	22	15%	10	45%
West	79	7	9%	5	71%
U.S. Total	361	89	25%	42	47%
GMP					
Northeast	45	17	38%	0	0
Midwest	90	25	28%	0	0
South	147	37	25%	8	22%
West	79	11	14%	3	27%
U.S. Total	361	90	25%	11	12%

Table 6

Chronically Distressed Metropolitan Areas vs. All Other Metropolitan Areas

	Employment			GMP		
	Chronically distressed metropolitan areas	All other metropolitan areas	Difference	Chronically distressed metropolitan areas	All other metropolitan areas	Difference
Percent employment in manufacturing (2000)	16.2	12.7	3.4***	14.3	13.3	0.98
Number of export industries (2000)	5.49	4.84	0.66**	7.77	6.42	1.3***
Percent of population 25+ with a high school education or less (2000)	53.9	47.4	6.5***	53.2	47.6	5.6***
Percent Hispanic (2000)	6.86	10.1	-3.3*	6.04	10.4	-4.4**
Average July temperature	74.8	76.3	-1.5**	75.4	76.2	-0.78
Right-to-work state (2000)	0.24	0.53	-0.29***	0.37	0.48	-0.10*
Herfindahl index	4.71	4.06	0.65**	4.29	4.64	-0.35
Number of research institutions	0.61	0.47	0.13	0.19	0.61	-0.42***
Distance to large metropolitan area	189	185	5	283	153	130***
Population (2000) - Median	163,706	238,314	-74,608**	146,438	273,170	-126,732***

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 7

Chronically distressed regions that showed recovery vs. chronically distressed regions that did not recover

	Employment			GMP		
	Chronically distressed metropolitan areas that DID recover	Chronically distressed metropolitan areas that DID NOT recover	Difference	Chronically distressed metropolitan areas that DID recover	Chronically distressed metropolitan areas that DID NOT recover	Difference
Percent employment in manufacturing (2000)	15.0	17.2	-2.14	8.89	15.1	-6.2***
Number of export industries (2000)	5.40	5.57	-0.17	6.90	7.89	-0.98
Percent of population 25+ with a high school education or less (2000)	53.3	54.4	-1.11	52.5	53.3	-0.82
Percent Hispanic (2000)	10.07	3.99	6.09**	4.80	6.22	-1.4
Average July temperature	75.24	74.43	0.81	79.5	74.8	4.8***
Right-to-work state (2000)	0.29	0.19	0.09	0.73	0.33	0.40**
Herfindahl index	4.16	3.98	0.18	4.19	4.30	0.11
Number of research institutions	0.69	0.53	0.16	0.36	0.16	0.20
Distance to large metropolitan area	181	197	-16	247	289	-41
Population (2000) - Medians	164,624	162,453	2,171	194,042	142,950	51,092*

* p < 0.10, ** p < 0.05, *** p < 0.01

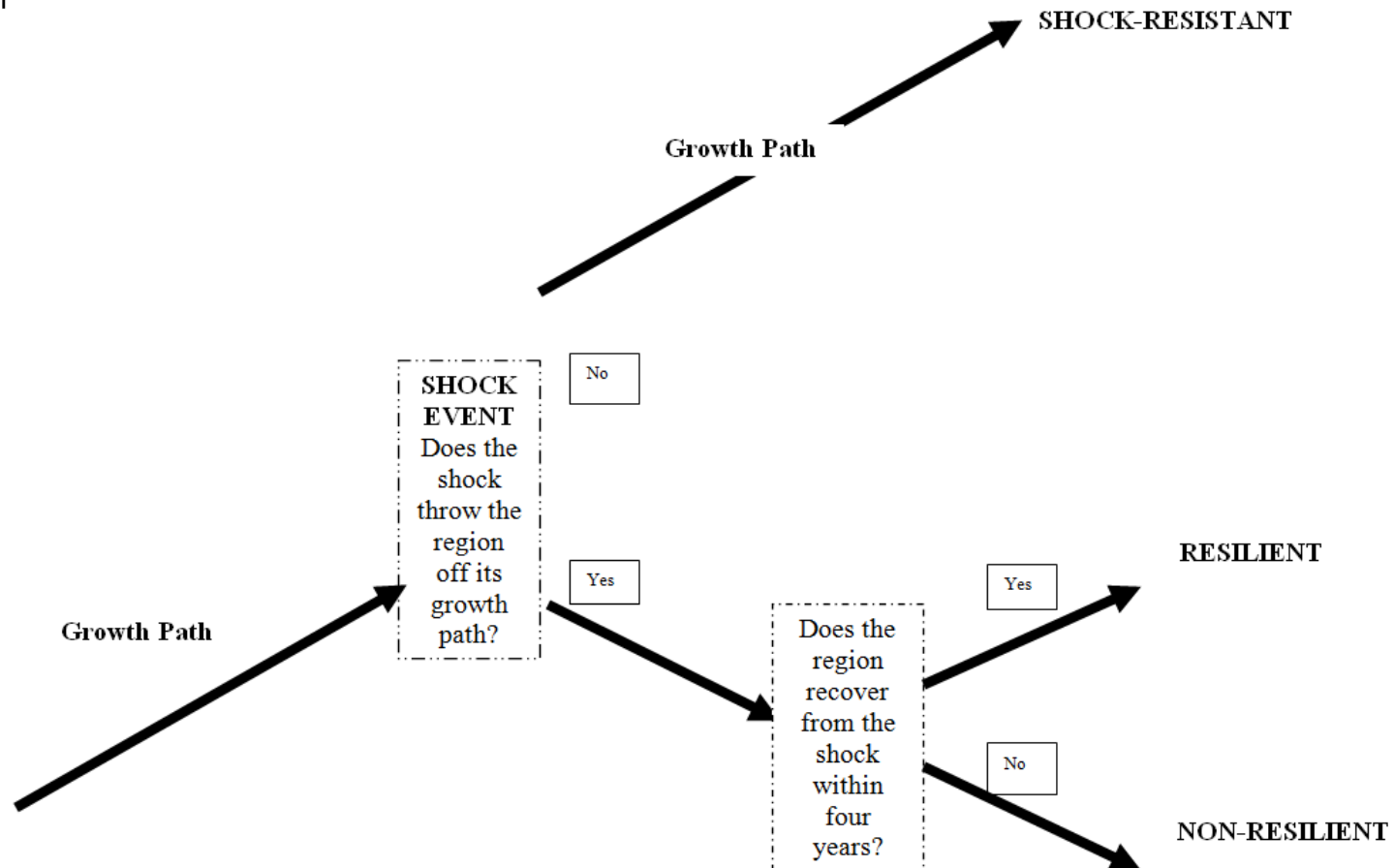
Table 8

Regression Results: Determinants of Chronic Distress and Recovery

	Region is chronically distressed (hazard model)		Region recovers from chronic distress (hazard model)		
	GMP	Employment	GMP	Employment	GMP
Low educational attainment	+	+	+	0	0
Earnings per job	+	+	+	-	-
Percent employed in manufacturing	0	0	-	+	-
Percent of employment in health care and social assistance	0	0	-	-	-
Percent employed in tourism-related industries	0	-	0	0	-
Economic diversity	0	0	0	0	+
Economic concentration	0	0	0	-	-
Number of research universities	0	0	0	+	-
Right-to-work	0	0	-	0	0
Percent Black	0	0	0	-	0
Percent Hispanic	-	-	-	0	0
High income inequality	+	+	+	+	+

Plus sign (+) indicates a positive impact that is substantively significant (with at least a 1 percentage point change) and statistically significant (at the 10% level or better); minus sign (-) indicates a negative impact that is substantively significant and statistically significant; zero (0) indicates an impact that is not statistically significant or, if statistically significant, not substantively important.

Figure 1. Resilience Concepts



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