BUILDING RESILIENT REGIONS
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[working paper]

Buddy, Can You Spare Some Time?
Social Inclusion and Sustained Prosperity in America's Metropolitan Regions

Chris Benner
University of California, Davis

Manuel Pastor
University of Southern California

MacArthur Foundation Network on Building Resilient Regions
http://brr.berkeley.edu

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Introduction

Since the early 1990s, a growing body of research has been documenting important links between social equity and economic growth at a metropolitan scale. Different specific measures of social equity have been employed in a variety of empirical exercises, including income inequality, spatial segregation by race, income or jurisdiction, and measures of racial inclusion along multiple dimensions. Almost regardless of the specific measures, it seems that social equity is correlated with economic growth and the stronger studies have provided evidence of not just correlation, but probable causation, with improving social equity actually contributing to more rapid economic growth.

In these studies, measures of economic growth invariably are focused on the *pace* of growth, whether in jobs, income, regional product or productivity. But partly because of the work of the Building Resilient Regions network sponsored by the MacArthur Foundation, attention has turned to questions of "resilience" or the capacity of regions to maintain growth paths in light of external shocks (Foster, 2012). Testing for the resilience dimension requires a different approach to both the theoretical framework and empirical testing, a task that can be difficult since resilience is a relatively new concept and so measurement issues take center stage (Hill et al., 2012). Does resilience, for example, mean the capacity to bounce back? Does it mean the ability to withstand shocks altogether? And how would we then measure the relationship of that outcome to measures of social equity?

Fortunately, an analog in the international literature may provide some guidance. After all, much of the early work on the relationship between equity and growth was inspired by findings in the development literature that countries with more equal distributions of income tended to growth faster and/or withstand macroeconomic shocks. And taking up the next phase in this work, recent studies conducted by researchers at the International Monetary Fund have tried to focus on not just the growth rate but also the ability to sustain growth over an extended period (A. G. Berg & Ostry, 2011; A. Berg, Ostry, & Zettelmeyer, 2012). The question of how to forestall the end of growth spells, these authors argue, is especially critical for poor countries of the world (their empirical focus) in which economic volatility and vulnerability to economic set-backs can be as much a problem as slow or negative overall growth. It may be the case, for example, that countries with more sustained growth spells also create an environment where investors feel more secure about the future, facilitating a sort of virtuous cycle. Perhaps most intriguing from our perspective is that they find that the duration of growth spells is strongly related to income distribution, suggesting that more equal societies tend to sustain growth longer.

The ability to sustain growth spells – to be resilient and sustain economic growth – is also of critical interest in the U.S. The social and economic costs of periods of recession are substantial. In addition, with growing global integration and technological innovation seems to comes increasing economic volatility and rapid economic restructuring (Shapiro & Varian, 1998). One of the critical dimensions of building resilient regions is surely the ability to sustain economic growth, however fast, in the fast of such economic restructuring. And relative income equality may be one of the moderating factors that can produce resilience, something currently being raised in the national context, as observers have increasingly noted that income inequality spiked prior to both the Great Depression and the Great Recession, giving analysts and policy

makers cause for at least wondering if there was a connection between unequal distributions,

financial crises, and economic slowdowns (Atkinson, Piketty, & Saez, 2011; Stiglitz, 2012).

What are the factors and processes that can help explain the ability of regions to sustain

economic growth, and what role does equity play in those processes? In an effort to contribute to

an answer to these questions, and building on the international work on growth spells, we

examine growth spells among the 184 largest regions in the United States (those with a

population exceeding 250,000 in 2010) from the period of 1990 to 2011. Examining year-to-

year quarterly employment growth, we find evidence that growth duration is positively related to

a number of factors one might expect, including lower levels of reliance on manufacturing and a

higher proportion of the population with what might be termed middle education levels (at least

high school degree but less than a Bachelor's degree). But of most interest here is that growth

spells seem to be made shorter when there are higher levels of metropolitan political

fragmentation, higher levels of racial segregation, and most significantly (both for theory and in

terms of statistical significance) higher level of income inequality.

The research is line with earlier work suggesting that equity may be good for the pace of

growth; this particular effort suggests that equity could be beneficial for sustaining growth over a

more extended period as well. Below, we review the literature on equity and growth both

internationally and domestically, then take up the specific question of equity and the length of

growth spells. We then explain our econometric methods and our results. As in Berg, Ostry and

Zettelmeyer (2012), this is really early work in which we do not offer a formal causal model but

rather offer an exploratory look at the relationships (including first looking at a series of

variables in univariate regressions before moving on to a multivariate setting). Nonetheless, like

those authors, we offer some tentative explanations why we think the pattern we find might exist

and then discuss the potential role of qualitative research in teasing out some of the actual causal mechanisms.

Equity, Growth and Growth Spells

Distribution and Prosperity: An International View

One of the first concepts taught in undergraduate economics is that there is a trade-off between equity and efficiency, between fairness and economic growth. Much of that argument is rooted in the stylized experience of long-term economic development. Kaldor, for example, argued that high level of savings among the rich, in order to invest in industries with large sunk costs, was a prerequisite for rapid growth (Kaldor, 1977). More benignly but no less forcefully, Kuznets argued that as labor shifts from sectors with low productivity to those with high productivity, inequality must increase initially in the growth process (Kuznets, 1955). In general, the message has been that interfering too early to promote a less skewed distribution of income could kill the engine of economic vitality.

Interestingly, this long-held view about the growth-equity tradeoff has, at least in the developing country context where much of it was originated, been challenged by a wave of multivariate and multi-country studies conducted in the 1990s and early 2000s (see Aghion, Caroli, & García-Peñalosa, 1999 for a review). Alesina and Perotti, for example, argued that inequality leads to social tension and political instability, thus lowering certainty, investment, and economic growth (Alberto Alesina & Perotti, 1996). Meanwhile, Rodrik noted that the ability of countries to handle external shocks in large part depends on the strength of conflict-

management institutions, such as the quality of governmental institutions, rule of law, and social safety nets, which themselves reflect and produce certain distributions (Rodrik, 1999).

Dymski and Pastor also provided an early insight into this effect in their study of the relationship between bank lending and debt crises in Latin American countries; they found that those countries that were more unequal in their distribution of income tended to be favored by private lenders (accounting for other factors such as GDP growth and trade openness) but that those countries were also the ones that tended to wind up with payments crises later on (Dymski & Pastor, 1991). Since all the other factors that had a positive effect on lending also had a negative effect on crises, they labeled the inequality measure a "misleading signal" and argued that strong priors about the trade-offs between equity and growth on the part of bankers (and economists) were possibly one reason why the equity-stability relationship was not recognized (a point to which we return in the conclusion).

But it's not just that a more equitable distribution of income can ameliorate social conflict and crisis: both Alesina and Rodrik, and Persson and Tabellini suggested that the more equitable is a society's access to productive resources, the less likely it is that society will seek redistributive policies that can reduce growth by introducing economic distortions, partly because the median voter may see less interest in protecting property rights (A Alesina & Rodrik, 1994; Persson & Tabellin, 1994). This is a sort of ironic argument in which equity protects innovation and competition: in a society where rewards are more widely spread, the connection between higher incomes and perceived productivity is clearer, and modest disparities do not yield politics that will upset investors.

Building on these insights and the regression results that support them, other researchers have argued that directly targeting poverty and inequality in the developing world may actually

be essential to promoting growth, especially through policies that increase the productive nature of the poor, such as investments in education (Birdsall, Ross, & Sabot, 1995; Deninger & Squire, 1996). Lopez and Serven also argue that poverty deters investment, which in turn lowers growth (a relationship that holds across broad samples of countries, across different time periods, and across econometric specifications, including attempts to control for the impacts of inequality on growth) (Lopez & Serven, 2009). And, as we note below, IMF staff economists Andrew Berg and Jonathan Ostry have extended this work by suggesting that reducing inequality is key to sustaining growth (defined as longer spells of growth that encourage long-term investor confidence) (Berg and Ostry 2011)

Equity and Economic Growth in America's Metropolitan Areas

While this notion of the complementarity of equity and growth has had some impact on the thinking and policies of multilateral institutions, it is only recently that the notion of a positive relationship between equity and long-term growth – beyond the usual Keynesian notions that placing money in the hands of less well-off consumers will yield a bigger economic bang for any stimulus dollar – has made its way into the discussion of the overall U.S. economy (Boushey & Hersh, 2012; Stiglitz, 2012).[1] But one arena where the economic argument for coupling equity and growth has gained some analytic, policy and political ground for a longer period of time is at the level of U.S. metropolitan regions.

Why the metropolitan level? While economists and others are more accustomed to looking at economic performance at the state or national levels, recent research suggests that metropolitan regions are an increasingly important economic unit in a globalized world, partly

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[1] See also the working paper by Levine, Frank and Dijk which looks at the effects of income inequality on "expenditure cascades" and finds that U.S. counties with the highest levels of income inequality were most likely to experience financial distress (Levine, Frank et al. 2010)

because this is the level where the intangibles of industrial clusters and innovation occur (Maskell & Malmberg, 1999; Storper, 1997). Our own econometric work, building on an early effort that reconfigured the U.S. as a "common market" of metropolitan regions (Barnes & Ledebur, 1998), suggests increasing heterogeneity in the long-term performance of America's metro areas, including growing differences in the ways in which poverty and growth interact at the regional level (Pastor, Lester, & Scoggins, 2009). Finally, there are increasing coalitions and collaborations of regional actors seeking metro-level development (Benner & Pastor, 2012; Pastor, Benner, & Matsuoka, 2009) and federal agencies, including Housing and Urban Development, the Environmental Protection Agency, and the Commerce Department are promoting new regional or metropolitan strategies (Pastor & Turner, 2010).

It is at this metro level that new evidence about the growth-equity relationship in the U.S. is emerging, partly because here time series analysis can be coupled with a wider cross-section set of observations. In a review of the earliest studies in this vein, many of which seemed to parallel the findings in the international development field, Gottlieb rightly argued that researchers were paying insufficient attention to multivariate controls and issues of simultaneity (Gottlieb, 2000). Both Voith (1998) and Pastor, et al. (2000) attempted to address these issues, however, incorporating other explanatory factors *and* considering the feedback effects of growth on poverty and income distribution (Pastor, Jr. et al., 2000; Voith, 1998). The findings remained supportive: even in a simultaneous setting, Voith found a positive association of suburban growth with city growth while Pastor et al. found that various measures of inequality (the city-suburb poverty ratio, the geographic concentration of the poor, the change in central city poverty, and more direct measures of income disparity) had a negative impact on per capita income

growth over the 1980s in seventy-four regions (and that the results held in a specified set of two-stage least squares regressions).

Utilizing data from the 1990 and 2000 Census on 341 metropolitan statistical regions in the U.S., Pastor found that real per capita income growth was negatively affected, controlling for other variables that should promote growth, by such distributional measures as the ratio of city to suburban poverty, the percent of poor residents in high poverty neighborhoods, the ratio of income at the sixtieth percentile to household income at the twentieth percentile, and the index of dissimilarity between blacks and whites at the metro level (Pastor, 2006). Again, the results held up to challenges of simultaneity, suggesting that the causal direction from equity to growth exists (as well as its obverse). In more recent work, Pastor and Benner found that such a dragging effect of inequality on growth held even in what might be termed "weak market" metros – places where some would say that anemic growth is an excuse for making attention to equity a sort of luxury concern (Pastor & Benner, 2008).

Federal Reserve economists conducted a similar analysis for nearly 120 metropolitan areas throughout the U.S. as part of a report for the Fund for Our Economic Future based in Northeast Ohio (Eberts, Erickcek, & Kleinhenz, 2006). Using factor analysis, the researchers identified eight key variables that influence economic growth on the regional level, including a region's skilled workforce, active small businesses, ethnic diversity and minority business ownership, level of racial inclusion, costs associated with a declining industrial base, income inequality (measured by income disparity and number of children living in poverty), quality of life variables (including universities, recreation, and transportation), and concentrated poverty in core cities. The results: a skilled workforce, high levels of racial inclusion and progress on income equality correlate strongly and positively with economic growth.

It's a Matter of Time: Equity and Growth Spells

While this work on U.S. metros has tended to look at economic growth rates, the international literature that helped inspire it has moved on to look at how to *sustain* economic growth. One of the striking characteristics of growth in developing countries over the last 50 year has been its lack of persistence, with more frequent fits and starts. Thus, a growing body of literature starting mostly in the 2000s has been looking at *turning points* in countries' growth trajectories, trying to explain both what helps countries shift from economic decline towards economic growth, and what happens to cause an end to growth periods (Aguiar & Gopinath, 2007; Hausmann, Pritchett, & Rodrik, 2005; Hausmann, Rodríguez, & Wagner, 2006; Jerzmanowski, 2005; Jones & Olken, 2008; Pattillo & Gupta, 2006; Rodrik, 1999).

Recent work by IMF researchers has looked not at what leads to positive turning points in countries growth trajectories, but rather what is important in explaining a country's ability to sustain economic growth and forestall a downturn (A. Berg et al., 2012). In essence, rather than understanding differences in before-and-after conditions of a turning point, they ask what a country is "doing right" that allows it to sustain growth. In their work, they first identify a total of 104 distinct growth spells of at least 5 years in a total of 140 countries (both industrial and developing) since the 1950s. They then examine a series of factors that might help explain the likelihood that a country could fall out of a growth spell, including: external shocks; political and economic institutions; inequality and fractionalization; social and physical indicators; levels of financial development; levels and types of globalization; patterns of current account, competitiveness and export structure; and patterns of macroeconomic stability.

Some of their findings reinforce previous research, such as that external shocks and macroeconomic volatility are negatively associated with the length of growth spells while

"good" political institutions are associated with longer growth spells. The authors also utilize a variety of indicators—including competitive exchange rates, external capital structures weighted towards foreign direct investment, and export product sophistication—that reinforce arguments about the value of export orientation and trade liberalization, especially in the context of being able to produce more sophisticated products. What is particularly interesting from our perspective though—and what the researchers themselves describe as a "striking" result—is that the length of growth spells is strongly related to income distribution, with more equal societies tending to be able to sustain growth over a longer period. Across their sample, a one percentage increase in a Gini coefficient of income inequality is associated with an 11-15% reduction in the expected duration of a growth spell. In their summary model combining a range of indicators, while there are many that remain significant, one of their conclusions is that "income inequality is among the most robust predictors of duration." (A. Berg et al., 2012, p. 160).

As for the application of this literature to the U.S., we have seen no studies of the length of growth spells, rather than simply the pace of economic growth; the work of Hill et al. (Hill et al., 2012) is a notable exception in some ways but there the focus is on a variety of different notions of economic resilience. For many reasons, the focus on overall growth rates is understandable. Aside from being simply easier to measure, the overall size of the economic pie determines the level of resources available in any society for all purposes, and more rapid economic growth also has many social benefits, including typically tighter labor markets (with associated wage increases) and at least the potential for more redistributive policies affecting new increments of resources without having to struggle over redistribution of existing resources.

In recent years, however, researchers have come to appreciate the significant social and economic consequences of economic turbulence. Spells of unemployment, for example, have

lasting effects on people's lifetime earnings long after they are once again able to secure

employment (Mroz & Savage, 2006). The impacts are not just economic but also include

psychological distress and decline in life satisfaction (Daly & Delaney, 2013). There is evidence

that new graduates entering the labor market during a recession also experience long-term

earnings declines when compared with those entering the labor market during growth periods, as

they start their work lives working for lower paying employers, with the earnings of less

advantaged graduates potentially damaged permanently by this cyclical downgrading (Kahn,

2010; Oreopoulos, von Wachter, & Heisz, 2012). Our own recent research on processes linking

social equity and economic growth also suggest that these beneficial processes may be more

prevalent in regions that experience moderate and unspectacular growth, rather than those iconic

regions that experience dramatic growth that swings from boom to bust (Benner & Pastor, 2012).

Explaining Sustained Metropolitan Growth in the U.S.

Our Analytical Strategy and Basic Data Setup

As we have noted, much of the previous work on the relationship between equity and

growth at a metropolitan level was inspired by work being conducted in the developing country

context. So it is with our effort now: building on the work of Berg, et al. (2012), we decided to

examine growth spells in the largest 184 metropolitan regions in the U.S. (all CBSAs (Core

Based Statistical Areas) that had a population of 250,000 or more as of the 2010 census). As will

be seen, we develop an analysis of growth spells in U.S. metropolitan regions that parallels as

closely as possible the international comparative analysis developed by Berg at al. (2012).

For our measure of economic growth, we used data from the Quarterly Census of

Employment and Wages (QCEW), which has a consistent measure of monthly employment

starting in 1990. We decided to look at quarter-to-quarter average employment, rather than month-to-month employment, given the volatility in monthly employment figures. We considered a region to have experienced growth in a quarter if the total average employment in that quarter was greater (by any amount) than the same quarter in the previous year; the year-over-year measure was used as a way of adjusting for seasonal variation in employment.

We considered a region to be experiencing a full *growth spell* if it experienced at least 12 quarters of uninterrupted quarter-to-quarter employment growth in this measure. At the time of our analysis, we had the full employment data from 1990 to 2011, for a theoretical possible maximum length of growth spell of 84 quarters (which would, we suspect, be both welcome and heroic). Why 84 rather than 88? Recall that a growth spell is defined as year over year growth so the first quarter one can really date from is the first quarter of 1991 and the last is the last quarter of 2011, giving us a total of 21 years. We resulted with a database of a total of 324 growth spells, in 181 of the 184 regions (the three regions with no growth spell of at least 12 quarters in this time period are: Buffalo-Niagara Falls, NY; Merced, CA; and Sarasota-Bradenton-Venice, FL – we apologize for letting the world know . . ..).[2]

In their analysis of growth spells for countries, Berg et al. look at indicators in a range of domains that might have an impact on growth.   The factors they chose were not based on priors related to a particularly theory of why growth is more sustained in some cases than others, but rather influenced by a variety of ideas from existing literature. They justify this relatively ad hoc approach with an appeal to the initial exploratory nature of their exercise; we request that readers grants us the same latitude in our work below. Many of the factors they look at—such as those

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[2] Note that in two cases, we lacked variables for all 181 regions: We were unable to calculate Gini coefficients for 10 smaller CBSAs (less than 500,000 population), and unionization rates for 15 smaller CBSAs are not reported. In regressions with those variables, we are actually analyzing 287 growth spells in 160 regions.

related to inequality and social conditions—have direct parallels to regional economies. Others, such as those related to macro-economic stability or level of development in financial institutions, are essentially uniform across the entire U.S. and thus are not appropriate for an analysis of regional growth spells.   Table 1 below provides a direct comparison of the domains analyzed by Berg et al, and the domains we include in our regional analysis below.

Table 1: Indicators Examined in Relationship to Growth Spells

Berg, Ostry and Zettelmeyer (2012)	Our Regional analysis
External Shocks	
Changes in terms of trade & U.S. Interest Rates	National recession and changes in national employment structure
Political Institutions	
Measures of democracy	Measures of metropolitan power diffusion
Inequality	
Gini, ethnic and linguistic fractionalization	Gini, minority middle class
Social indicators	
Education, mortality, telephone lines	Racial isolation, educational attainment, share of immigrants
Globalization	
Trade liberalization, sum of external assets and liabilities	Export dependence, employment structure
Economic institutions	
Contract enforcement, profit repatriation, payment delays	Percent unionization
Current account, competitiveness, export structure	
Current account balance, domestic savings, overvaluations of price levels, sophistication and flexibility in export products	None (equivalent across the U.S. except perhaps for sophistication of export products, which we have not yet analyzed)
Macro-economic stability	
Inflation, exchange rate depreciation	None (equivalent across the U.S.)
Financial development	
Bank deposits and private credit	None (equivalent across the U.S.)

The testing technique used in this exercise is a Cox regression. A Cox regression is a particular type of survival analysis regression method, all of which are used to describe, explain or predict the occurrence and timing of events. In our case, what we are measuring is the *hazard rate* – and a hazard occurs when one's region falls out of a sustained growth spells. In essence, we are trying to see which of the factors above are associated with an early exit from sustained growth. As will be seen, the reported coefficients are so-called "hazard ratios" that are always positive; when a coefficient is more than one, that means the variable being tested is associated with falling out of a growth spell and when the coefficient is less than one, the variable being tested is associated with staying longer in a growth spell.[3]

What do the spells look like? Figure 1 presents the unconditional hazard for spells of a minimum of 12 quarters, essentially showing the cumulative survival function of our growth spells; note that no one falls out in the first twelve quarters because, by definition, one needs to have a three year growth spell in order to make it into the sample. The test is essentially once you're in, what will knock you out.

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[3] Berg et al. (2012) report time ratios rather than hazard ratios; the two measures move in opposite directions but we report hazard ratios because they might be more familiar and because they are what is reported directly in SPSS, our program of choice for this exercise. To check our results, we also did all the regressions in STATA, using the Streg command with the accelerated-time-to-failure option (the method used in Berg et al. (2012)). We report those results in a footnote when we consider the integrated model; suffice it to say that everything moves in a very similar direction.

Survival Function at mean of covariates
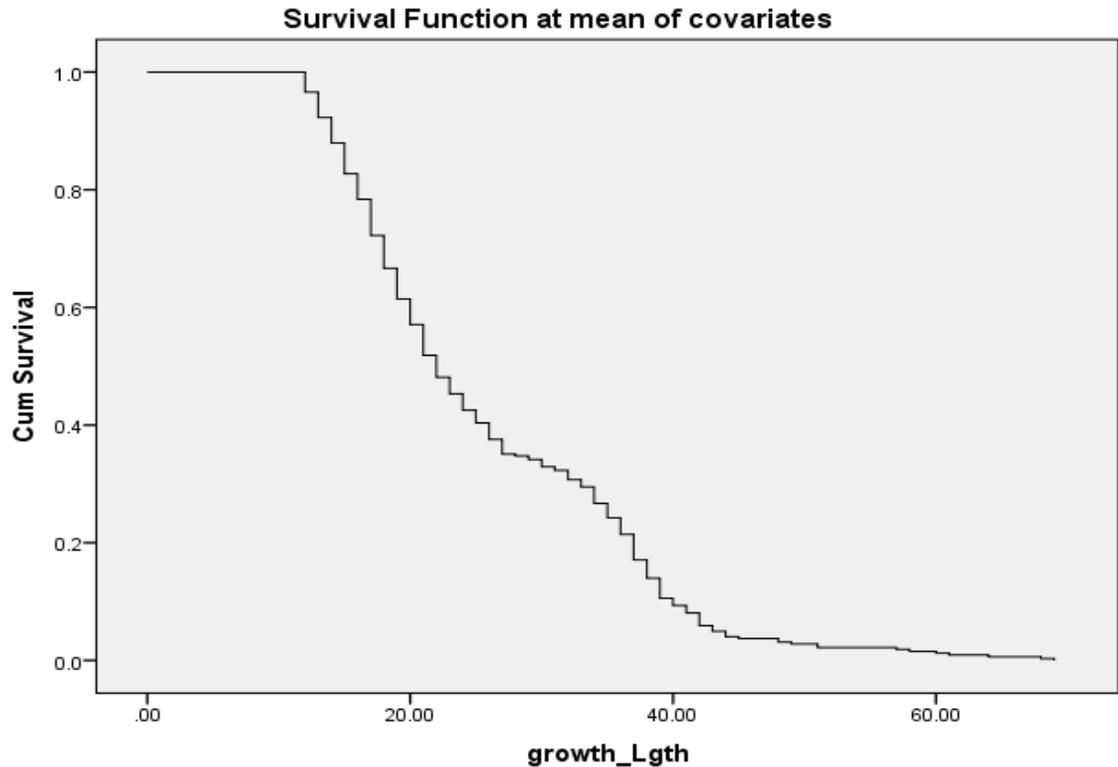
Finally, before discussing some methodological details, we should note that, unless indicated, the right-hand side variables below came from a database assembled for the BRR network that contains economic, civic, social, housing, geographic, and demographic measures for several decades for all 934 Core-Based Statistical Areas (CBSAs) in the United States. One special feature of the data is that CBSA boundaries have been made consistent to compare measures across the 1970, 1980, 1990, and 2000 Censuses and recent versions of the American Community Survey (ACS) (here, we just use 1990 and 2000 Census data).

Some Sample Complications

There are some complications in our dataset that raise the issue of what exactly should be "censored" in the hazards analysis. The most common issue of censoring in hazard regression is *right censoring*—which occurs when an observation is terminated before the expected event occurs. All survival analysis software is designed to handle this kind of right censoring, and in

our case only one growth spell (of a minimum of 12 quarters) was continuing at the end of our time-period of analysis (end of 2011 – this doesn't mean that other growth spells had just gotten started but they hadn't yet lasted long enough for us to hit "spell" status). This might seem unusually lucky for us but it was because of a bit of bad luck for the country as a whole: the Great Recession and the way it rippled out and cut growth across nearly all metropolitan regions.

We would seem to have a bit less luck with the starting point. Our challenge is that the data for our analysis starts in 1990 and the first complete quarter of year over year growth is in 1991. It turns out that there were a total 29 out of our 324 growth spells that began with the beginning of our time-period of analysis. We thus know a *minimum* length of these 29 growth spells, but not the actual full length. This is a different situation than the two other types of censoring commonly encountered in survival analysis: *left censoring,* in which an event is known to have happened before some particular time, so a *maximum* value is known; or *internal censoring* in which an event is known to happen between two points in time, but the exact time is unknown (Allison, 2012; Finkelstein, 1986; Klein & Moeschberger, 2003).

Because of the uncertainty of length for that particular set of growth spells and a lack of clear guidance in the literature on how best to handle such cases, we tried running two different sets of regressions: one in which we simply excluded those 29 cases with incomplete growth lengths, and one in which we included them and treated them as regular growth spells, assuming that their growth spell did actually begin at the beginning of our time-period. The 29 incomplete growth lengths are longer (average of 35 quarters compared to 25 quarters in all complete growth spells and 30 quarters in other growth spells that began in the 1990s) though nearly identical length to growth spells that began in subsequent quarters in 1991 and in smaller metropolitan areas (86% in metro areas with less than 1 million residents, compared to 70% in metro areas

with complete growth spells). Despite these differences, there were only minor differences in the regression results (which we mention below where appropriate) so we present the findings below for the entire sample.

A further note on this issue: one reason why we may be finding similar results is that the left truncation of growth spells may not actually be much of an empirical (rather than a theoretical) problem. The U.S. experienced a short but relatively sharp recession between July 1990 and March 1991, with the sharpest impact on GDP in the fourth quarter of 1990. This may have clipped many regions such that having positive year over year employment growth in the first quarter of 1991 meant that one was simply making an early exit from the slowdown (which would be consistent with the subsequent longer growth spells) and we are not misgauging the length by much if at all for those aforementioned 29 cases. In any case, the regression results with and without these cases are virtually identical.

Base Regression Specification

In all of our regressions that follow, we include dummy variables for census region and we also include both regional per capita income and the log of the metro population (normed relative to the sample) as controls. Regional per capita income is included partly because a parallel starting point variable is used in Berg et al. and partly because the regional economic convergence literature generally utilizes some measure of regional income as a starting point (because of the tendency to gravitate to the mean; see the discussion and parallel construction for growth equations in (Pastor, Lester, et al., 2009); the coefficient, which we do not report to conserve space, is always pointed in the appropriate direction (higher per capita income is associated with shorter growth spells) and significant in our full specification (which is similar to

the results in Berg et al. (2012)).[4] We included metro size, a familiar control, because larger

metros might be more resilient to shocks and that is indeed the case in our regressions; our

measure variable is similar to the metro size variable used in a recent effort by Li et al. (2013) in

which the authors use the logged value of metro area (we think our specification with population

makes more sense).

Note that these and all other variables we look at do not vary during the time of the

growth spells, and thus should be considered as initial conditions, with the test being how the

initial conditions affect the length of growth spell. However, spells get started at different times

and so too the initial conditions. We have selected the time-year of these variables that is the

closest available data prior to the beginning of the growth spells (e.g. 1990 census data for

growth spells beginning in the 1990s and 2000 census data for growth spells beginning in the

2000s).

Finally, we should stress that another way in which our approach parallels Berg et al. is

that this is a very exploratory exercise. As those authors state "We sequentially test the relevance

of particular regressors of interest, while including some minimal controls . . . At the end, we

summarize by showing the results of a few parsimonious regressions that control for all or most

of the variables that were found to matter during the sequential testing process" (A. Berg et al.,

2012, p. 152). We follow suit and while, like Berg, et al., the approach is unorthodox (there is no

strong model specification prior to exploration), we do offer heuristic rationales (and sometimes

a bit better!) for looking at the variables and again emphasize that this is very initial work

looking to establish some basic patterns for future exploration in both quantitative and qualitative

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[4] In their analysis, Berg et al note an additional implication (beyond the convergence process) of the finding that
   lower initial income is an important predictor of longer growth spells: namely that this constitutes evidence against
   the poverty traps hypothesis. See (A. Berg et al., 2012, p. 160)

work. Partly because of this, we report not just on the usual significance levels (.01, .05 and .10) but also note when variables achieve a significance level in the neighborhood of .20; the idea is to point to relationships for which further research will be needed.

External Shocks

An external shock is one of the most likely factors to end a growth spell and we consider two forms of such shocks. The first form is simply whether the national economy is in recession.[5] For this, we initially tried two distinct measures. Our first measure was an indication of the length of time in which a region has been able to resist the 'drag' effect of the national economic recession, thus indicating a certain resilience in the face of this external shock. Our specific measure here is the percentage of total quarters within the growth spell in which the national economy was in recession. A second measure we tried – and discarded for reasons that will be obvious – is simply a dummy variable of whether the regional growth spell ended during a period of national economic recession.[6]

In our first model (see Table 2 below), we just include the measure of the percent of the growth spell that the nation is in recession. Here, the results are significant at the .10 level with the expected sign—the higher percentage of the time that a regional growth spell coincides with a national recession, the greater likelihood it will fall out of a growth spell. Note how one should read these coefficients: the 1.02 coefficient indicates that an increase of one unit (in this case the

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[5] As determined by the Business Cycle Dating Committee of the National Bureau of Economic Research. See: http://www.nber.org/cycles.html.

[6] An alternative measure of external shock we hope to explore in future work is more region and industry specific. We hope to look at national employment in all 2-digit [perhaps 3-digit] NAICS codes which account for greater than 5% of national employment, and identify a quarter as being an industry-recession quarter if year-to-year employment change is negative. Our thought is to assign this industry-recession variable to a region if total employment in that industry in the region is also greater than 5%. However, even the basic setup for this paper took much more time than we anticipated and so we leave this to a future effort.

percentage of the region's growth spell that the nation is in an overall recession) is associated with a 2% increase in likelihood of growth ending.

As noted, we also tried a Cox regression in which we entered the dummy variable of whether the national economy was in recession during the quarter in which the region ended its growth spell, as well as one in which we entered both that dummy *and* the percent of time in the growth spell the nation was in recession (what we call Model 2 in the paper). It is important to note that only 54% of our growth spells actually end during a national recession but controlling for this may still make sense. As it turns out, the recession dummy variable is highly significant in both specifications (with a very small impact) but at first consideration, the impact seems to be in the wrong direction (albeit one consistent with the simple means comparison above)—a growth spell that ends in a national recession is likely to be longer than one that doesn't.

Table 2: External Shocks

| | Model 1 | |
	Hazard Ratio	Sig
Percent of Growth Spell in National Recession	1.018	0.09
Recession At End	0.998	0.07
(variables entered separately)		
	Model 2	
	Hazard Ratio	Sig
Percent of Growth Spell in National Recession	1.028	0.01
Recession At End	0.997	0.01
(variables entered simultaneously		

This is a seeming anomaly – but not after a bit of consideration. Consider the unadjusted means: the average length of spells that ended in a recession is actually longer (26.77 versus 24.59) than those that ended outside of a national recession, a pattern consistent with the adjusted measure in the regression. The way to think about this result is that a region that takes a national recession to get knocked off its growth spell is actually more resilient and probably had its

growth spell start earlier and thus last longer. Because this is exactly what we are trying to explain with our other variables, we do not include the "recession at end" variable in our final multivariate specification (although the results do not change much if we do).

Political Institutions

In studies of regional development, the structure of regional government can play an important role in shaping growth dynamics. There is now a voluminous literature on the importance of regional economies as an important economic unit and the ways that regional collaboration is important for promoting economic competitiveness (Cooke & Morgan, 1998; Martin, Kitson, & Tyler, 2012; Scott, 1998; Storper, 1997). Regional equity advocates have also argued that the fragmentation of local government within metropolitan regions has been an important driver of inequality, as differential tax bases and segregation between cities can leads to distinctly different trajectories and opportunities (Rusk, 2003). This could lead to indirect effects on growth but also more direct effects if metropolitan jurisdictions find it difficult to collaborate on needed public investments.

In our recent volume titled *Just Growth: Inclusion and Prosperity in America's Metropolitan Regions*, we found some qualitative evidence supporting a link between structures of regional government and both equity and growth. Two of our case studies of what we termed "just growth" regions – places where growth rates and equity improvements were strong relative to their broad census region – had merged their city and county governments in the 1960s (Nashville and Jacksonville), and our other two case studies either had experienced substantial expansion of the central city through annexation (Columbus) or had a particularly comprehensive metropolitan planning organization (Kansas City) (Benner & Pastor, 2012) On the other hand,

some recent research has suggested that fragmentation, perhaps because it promote Tieboutian competition, can be consistent with more rapid growth (Grassmueck & Shields, 2010)/

There have been essentially two different approaches to integrating an analysis of structures of local government into comparative analysis of metropolitan dynamics. One methodology involves simply counting the number of governments, either in absolute terms or on some per capita basis (Dolan, 1990; Goodman, 1980; Grassmueck & Shields, 2010; Ostrom, Parks, & Whitaker, 1974). While this provides some useful insights, since additional units of government definitely create additional actors with political power and fiscal authority. However, it fails to provide any measure of the role governments play or their relative power in the region.[7]

A second approach, most prominently represented in the Hirshmann-Herfindal Index, is also a relatively simply approach based on a concept of market share. It provides a measurement of the concentration of expenditures of all governmental units in a region, and is measured as the sum of the squared percentage of each player's share of the total market (Grassmueck & Shields, 2010; F. M. Scherer & Ross, 2009). This approach is useful as a measure of economic and fiscal power in the region but does not do a very good job of capturing influences related to the number of jurisdictions and their very real impact on regional decision making processes, even if they have small sizes. This is important, for example, in the various ways that jurisdictions are represented on regional planning bodies based simply on their existence as a jurisdiction, irrespective of their fiscal or population size (Nelson, Sanchez, Wolf, & Farquhar, 2004; T. W. Sanchez, 2006; T. Sanchez, 2005)sa

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[7] Indeed in our Just Growth book, we took this approach of measuring number of governments per capita and found no significant relationship to either growth or equity. See footnote 11 page 194.

David Miller of the University of Pittsburgh has developed an innovative methodology that builds on this Hirshmann-Herfindal Index approach but also incorporates the number of jurisdictions in the region (Hamilton, Miller, & Paytas, 2004; Miller & Lee, 2009).[8]   He calculates this by using the square root of the percentage contribution to total regional expenditures, rather than the square. This has the impact of giving greater mathematical value to the smaller units. In his words: "Basing the scale on the percent contribution of each player serves to reflect the economic dimension while using the square root of that contribution service to reflect the political dimension of power derived from the semi-sovereignty of political jurisdictions in a metropolitan environment".[9]

Miller and his colleagues have calculated this Metropolitan Power Diffusion Index (MPDI) for all 942 U.S. Metropolitan and micropolitan statistics areas in the U.S., for three different years: 1987, 1997, 2007. For our purposes, we use the MPDI for 1987 for all growth spells that start before 1997, and the MPDI 1997 for all growth spells starting after that (there were no growth spells of a minim of 3 years length that started after 2007).

When measured alone (along with the regional, per capita income and metro size controls), it turns out that the MPDI is associated with the shortening of growth spells, albeit at the .15 significance level (again, we are reporting on modestly significant relationships given the exploratory nature of this exercise—see Table 3). As we will see later, the statistical significance improves when MPDI is included in regressions with a range of other indicators, suggesting political fragmentation might be a drag on sustained growth.

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[8] http://www.metrostudies.pitt.edu/Projects/MetropolitanPowerDiffusionIndex/tabid/1321/Default.aspx

[9] See David Miller (2012) "Methodological Framework for the Metropolitan Power Diffusion Index" University of Pittsburgh, Center for Metropolitan Studies, Research Note, February 2012, available here: http://www.metrostudies.pitt.edu/LinkClick.aspx?fileticket=RvyYKVf31s0%3d&tabid=1321

Table 3: Regional Governance		
	Hazard Ratio	Sig
Metropolitan Power Diffusion Index	**1.056**	**0.15**

Inequality

In order to look at the role of inequality in shaping growth spells, we use the Gini coefficient of household income inequality, calculated from metropolitan household income data from the decennial census. For growth spells that start before 1999, we use a regional Gini calculated for from the 1990 census (based on 1989 incomes), and for spells that start after 1999, we use a Gini calculated from the 2000 census; both of these were calculated as part of "America's Tomorrow," a joint project of PolicyLink and USC's Program for Environmental and Regional Equity. We also developed measures of what is sometimes referred to as the 'minority middle class'—although we readily acknowledge that the conception of what constitutes a 'minority' is rapidly changing! In our case, we look at the proportion of the African-American and Latino populations in each region, both individually and combined, that are in the middle income brackets for the region. In our *Just Growth* research, this indicator of economic opportunity for historically disadvantaged populations turned out to be strongly associated with what we termed "just growth" regions (places where equity and overall growth were both improving). Here, we think it might be an indicator of both racial equity, and a diversity of economic opportunities and markets in the region.

As shown in Table 4, the Gini coefficient turns out to be extremely significant (yes, that isn't a typo – the significance levels is at 0.00), and powerful. A one point increase in the Gini is associated with a 21% increase in the likelihood that a region will fall out of the growth spell. The higher the level of inequality, the more likely the region's growth spells will be cut short. Our minority middle class variables are also significant, and show that regions with a higher

percentage of minorities in middle class income brackets are more likely to have longer growth spells. We should note that there are high levels of correlation between our minority middle-income bracket variables and other variables we examine, and that their significance falls out when these variables are included in more integrated models which we discuss below.

Table 4: Inequality

	Hazard Ratio	Sig
Gini Coefficient (initial level)	**1.213**	**0.00**
Percent African-Americans in Middle Income Brackets	**0.963**	**0.08**
Percent Latinos in Middle Income Brackets	**0.960**	**0.04**
Percent both Latinos and African Americans in Middle Income Brackets	**0.911**	**0.00**

Note that the variables are presented in a single table for convenience, but that each was modeled separately

Social Indicators

In addition to inequality, we looked at a range of indicators of social conditions at a regional scale, including measures of spatial segregation, educational attainment, and levels of immigration, all of which are from the 1990 decennial census for growth spells beginning in the 1990s, and from the 2000 decennial census for growth spells beginning in the 2000s. For spatial segregation, we looked at a familiar metric, the dissimilarity index, in this case calculated in terms of non-Hispanic whites and everyone else. The dissimilarity index ranges between 0 and 1 (which we multiply to be between 0 and 100 to be consistent with other measures), with higher numbers indicating a larger share of the population that would need to move for both groups

(whites and non-whites) to be perfectly integrated across the metropolitan landscape. We also looked at the relationship between city and suburban poverty rates.[10]

For education, we looked at two measures: the proportion of the population 25 years and older with a bachelor's degree or higher and the proportion with at least a high school degree but less than a bachelor's degree; the default category is the proportion of the population with less than a high school degree. Perhaps running against the grain of most analysts (but consistent with the data, as it turns out), we thought that a more educated population would be associated with a more volatile economy (see Benner, 2002) and that a more educated "middle" (high school to A.A.) would be associated with more steady growth. Finally, we also look at the percentage of the foreign-born (immigrant) population in each region with some ambiguity about the sign – more immigrants can be consistent with faster subsequent growth but the new population can also be a sort of "shock" that could disrupt a growth spell (Pastor & Mollenkopf, 2012).

The results of these various regressions are shown in Table 5. In general it can be seen that these social indicators have some effect, but unevenly, and the magnitude of the effect is substantially less than the single measure of income inequality. The level of racial segregation does have an effect, albeit at the .12 level, with those regions in which people of color are more segregated more likely to fall out of a growth spell sooner. The ratio of city to suburb poverty rates is also associated with a shorter growth spell but with a significance level of .23. Of our two education measures, the measure of the population with a bachelor's degree or higher is associated with shorter growth spells but it is very insignificant . In contrast, the proportion of

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[10] The ratio is calculated for the so-called principal cities of a metro area relative to other areas. Many of these might be considered large suburbs by urban observers but that is the split available from the Census.

the population with at least a high school degree but less than a bachelor's degree is statistically significantly (at the .03 level) with those growth spells in regions with a larger proportion of these middle-educational population less likely to fall out of a growth spell.

The proportion of immigrants in the region also has a significant relationship to the length of growth spell, with a high share of immigrants associated with a shorter growth spell at the .001 level. This is fairly dramatic but the effect moderates when we include additional variables later. Still, this might reflect the sort of "immigrant shock" discussed by Pastor and Mollenkopf (2012)

It is worth noting that it is in these social indicators where some substantial differences emerged when we excluded our 29 growth spells of uncertain length that possibly started prior to 1990. When those growth spells are excluded, only three indicators are statistically significant: the percentage of adult population with at least a high school degree but less than a BA, and the percent of population foreign both, both of which have similar time ratios and significant levels; and the percentage of adult population with a BA Degree or higher, which becomes significant at a .04 level and has a time ratio of 1.03. This higher education variable seems to suggest that regions with a high proportion of highly educated population are more likely to fall out of a growth spell. Our working hypothesis in this case, is that those regions are likely to have more employment in technology and information-driven industries, which substantial research has demonstrated are significantly more volatile in their employment patterns (Benner, 2002; Brynjolfsson & Saunders, 2010; Shapiro & Varian, 1998). That this effect rises when we exclude growth spells that may have been started before 1991 squares with this; the high-tech effect should be stronger later in the period in question.

Table 5: Social Indicators

	Hazard Ratio	Sig

Dissimilarity Index, Non-Hispanic Whites	**1.010**	**0.12**
Ratio, Principal City to Suburban Poverty Rates	1.098	0.23
Adult population with BA Degree or Higher	1.010	0.44
Adult Population with HS to AA Degree	**0.975**	**0.03**
Percent of population foreign born	**1.029**	**0.00**

Note that the variables are presented in a single table for convenience, but that each was modeled separately

Globalization and Employment Structure

We looked at four broad measures of industrial structure in the region. Three are related to the employment structure—namely the percentage of workforce employed in construction, in manufacturing, and in public administration. Again, these figures are from the 1990 census for those growth spells beginning before 2000, and the 2000 decennial census for those spells beginning afterwards. The fourth was designed as an indirect measure of the global integration of the region, and is a measure of the proportion of gross regional product accounted for by international exports in 2007, chosen because this was before the impact of the recession and because the earliest consistent metropolitan export data from the Department of Commerce starts in 2005. We note that this is a highly imperfect measure as it is taken from the end of the period rather than before but we had no other such variable available to us for the earlier periods.

As shown in Table 6, the employment structure does have some impact on length of growth spells. Of most interest here, perhaps, is that the percentage of employment in public administration is negatively and significantly associated with the length of growth spells, with an increase of a percentage point of the workforce employed in public administration associated with a 6% decline in the probably of falling out of a growth spell in each quarter. Manufacturing and construction, each entered alone, do not have a significant impact on the length of growth spells but the level of global integration of a region, at least as measured by the export

dependence of the regional economy towards the end of our time-period, is indeed important: those regions that have higher exports are also more likely to fall out of a growth spell (a finding in keeping with the idea that these might be more volatile economies).

It is worth nothing that in our regression with the 29 uncertain length growth spells excluded, the export variable becomes less significant (sig= .22, though with the same sign) but the construction variable becomes significant (at least by our looser exploratory standards – it hits the .12 level) with a hazard ratio of .93.

Table 6: Employment Structure and Export Dependence

	Hazard Ratio	Sig
Percent employment in public administration	**0.954**	**0.02**
Percent employment in manufacturing	1.004	0.66
Percent employment in construction	0.971	0.46
Exports as percent of GMP	**1.011**	**0.03**

Note that the variables are presented in a single table for convenience, but that each was modeled separately

Economic Institutions

Most of the economic institutions that Berg et al. use in their study are country-level indicators, and not relevant for a regional analysis. Most economic institutions don't vary substantially from region to region across the U.S., or are difficult to capture quantitatively (such as economic development strategies and institutions). There are some state-level differences, such as in minimum wage legislation or in right-to-work legislation, but with multiple metro-regions in single states, and some metropolitan regions crossing multiple state boundaries, this didn't seem like an appropriate set of variables. One major difference in economic institutions from region to region is the percentage of unionization. So here, we did look at the proportion of the total workforce at the CBSA level that is covered by a union contract, but when examined

alone, it turned out not to be statistically significant,,though we do include it in our integrated

model, to which we now turn.

Integrated Model

Having looked at each of these indicators and their relationship with the length of growth

spells individually, it is important to see if those relationships hold up if they are jointly included

in the model.   We did this by first utilizing nearly all the variables explored individually above

in a single regression; as will be seen, there was an anomalous result which required a bit of

investigation and reworking we note below. In all specifications, we included our normal

controls of census region, regional per capita income, and metro size.

The "integrated" specification is offered in Table 7 below. As one will see, a few

variables are not included. One is the "end of recession" variable for reasons discussed earlier;

as noted, its inclusion does not affect the results but it seems theoretically inappropriate. We also

included only one educational attainment indicator – only one was significant on its own and

including both would lead to problems of collinearity not of variables measuring different things

but variables measuring nearly the same thing! We included all the economic structure variables

even though some were insignificant since we thought the interactions with the other variables

might lead to shifts in significance levels (and it did).

What we found in our initial specification was that metropolitan diffusion, higher levels

of inequality, and higher levels of racial and income segregation are associated (and significantly

so) with shorter growth spells. Also associated with shorter growth spells were the percent

foreign born and the share of the workforce in manufacturing. The share in construction – likely

a sign of a boom and bust economy – was also associated with shorter growth spells, albeit not

quite as significantly as the rest of the variables. But the anomaly in the result was that a broadly educated middle was actually associated with shorter growth spells.

We found this shift in the direction of influence strange – and not only because we felt like a policy recommendation to have a less educated population was likely to be met with some skepticism. We thus decided to build up a growth spells Cox regression in a different way: we started with the economic structure variables and our educational indicator and discovered that a broadly educated middle was associated with longer growth spells (as we found when it was entered alone), albeit at the .20 level. What seemed to shift the sign was the entrance of the Gini coefficient variables – a sensible thing given that inequality would likely be larger if the middle was less educated.

To deal with this issue, we constructed a simple linear regression in which the dependent was the original Gini coefficient and the independent was the share of the population with at least a high school degree and less than a B.A. The regression was weighted by metro population to give a better sense of the overall relationship and we then took the residuals of the regression as a sort of detrended Gini coefficient – that part of inequality not directly explained by the single educational variable we are using in this exercise. We then reran the individual Cox regressions with the Gini coefficient and the Gini residual from this exercise; both were highly significant but, as one might expect, the hazard ratio for the modified Gini coefficient on its own was lower (since some of the underlying explanatory power from the education structure – that is, its role in postponing the "hazard" of an end to a growth spell – has been set to one side).

The Cox regression results with that modified Gini coefficient are shown in Table 7. Metropolitan diffusion and higher levels of inequality are associated with shorter growth spells and the effect is very significant. Competing for significance – because there is some degree of

correlation – are residential segregation by race and the city-suburb poverty ratio; removing either one would drive up the significance of the remaining variable. Also associated with shorter growth spells were the percent foreign born, the share of the workforce in manufacturing, and, to a lesser degree of significance, the share of the workforce in construction; positively associated with the length of growth spells is the percent of the population with a middle level of education. The other variables are generally signed as expected, although it is important to note that the percent in public administration is now associated with shorter growth spells while it was associated with longer growth spells when entered on its own; our thought is that on its own, it might be associated with relative equity but when entered into a regression where inequality is a direct measure and other dynamic aspects of the economy are accounted for, a larger public sector may be a sign of a more rigid and less resilient economy.

Table 7: Integrated Model with GINI Residual

	Hazard Ratio	Sig
Percent of Growth Spell in National Recession	0.999	0.93
Gini Coefficient (residual)	**1.302**	**0.00**
Metropolitan Power Diffusion Index	**1.094**	**0.05**
Percent Minority Middle Class	1.001	0.98
Dissimilarity Index, Non-Hispanic White	**1.012**	**0.20**
Ratio, Principal City to Suburban Poverty Rates	**1.162**	**0.11**
Adult population with HS to AA Degree	**0.972**	**0.13**
Percent of population foreign born	**1.047**	**0.00**
Percent employment in public administration	1.031	0.27
Percent employment in manufacturing	**1.058**	**0.00**
Percent employment in construction	**1.086**	**0.14**
Exports as percent of GMP	0.998	0.83
Percent of workforce covered by a union contract	1.011	0.37

Of course, the big news is that the Gini coefficient remains highly significant and, interestingly, the coefficient is essentially the same as before we did the detrending (every other coefficient is stable as well which makes sense since the "detrending" exercise was only to

separate out the education and Gini factors). Less newsworthy: the two least significant

variables are the percent of the spell the nation was in recession and the export volatility

measure. That the percent of a growth spell that is in a national recession is not significant in this

combined model provides some further evidence of the substantial variation in regional fortunes

throughout the country. As for export volatility, we think that this is an imperfect and after-the-

fact measure and hope to secure better variables for future testing.[11]

Also worth noting is that in this model the proportion of the workforce covered by a

union contract is associated with shorter growth spells (although the significance level is around

.3 and does not improve even in a more parsimonious model). This may suggest a dragging

effect of unions on the ability of a region to adjust to shocks or it could simply signal the sort of

industrial structure a region has; still, it suggests that unions, usually viewed as an unambiguous

good by some progressives may also have their bad side and that one might want to distinguish

between different sorts of unions and central labor councils (Dean & Reynolds, 2009)

Three final notes. First, in our regressions that excluded the 29 growth spells of uncertain

length, the only difference that emerged was that the dissimilarity index and construction

variable lost their significance (though the signs remained the same), and both the city/suburb

poverty ratio and our education measures increased their significance , moving below the .10

level in both cases (.097 and .088 respectively), though with little change in the hazard ratio.

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[11] As noted, we also ran the model using Streg with an accelerated-time-to-failure option in Stata in order to obtain
results more directly parallel to do those in Berg et al. (2012); we specified the Weibull distribution as did they.
The only difference of note in the individual regressions is that the negative effect of the share of the population
with a B.A. or better was more significant (although the high school to A.A. variables was still much more
significant. In the integrated model, virtually everything was identical in terms of significance level with the
following exceptions: MPDI and the dissimilarity index were less significant and the city-suburb poverty ratio was
more significant, suggesting that the competition for significance of these similar variables winds up slightly
different outside the Cox specification; the share of the workforce in construction also became insignificant
although it was signed as expected. One interesting outcome: the time ratio coefficient we obtain from this
regression for our Gini measure, the only exactly parallel right-hand side variable between the Berg et al. (2012)
study and ours, is virtually identical to the similar measure they obtain.

Second, because we were worried about the impacts of the Great Recession on our results – after all, part of the reason we weren't worried about right-censoring is that all the growth spells were clipped by the end of the period we examined – we re-ran the full model with a dummy variable that equaled one if the growth spell ended in the official recession period (December 2007 to June 2009, so fourth quarter of 2007 to second quarter of 2009). The variable itself was not significant and the only variable that lost just a bit of its significance was the percent of the workforce in construction, a sensible turn of events given the role that sector played in the most recent turndown.

Our third note is a less technical but quite important caveat. Recall that this is a regression on the length of growth spells in the 1990s and 2000s in metropolitan America. It may well be that inequality can contribute to growth in some circumstances and retard it in others – that is, we tend to think that there may be a U-shaped relationship in which "perfect" equality does indeed destroy incentives and hurt economic expansion. It may well be that we are simply past a sort of "peak" level of inequality in contemporary America – and that it is a question of rebalancing priorities and strategies to obtain more inclusive and more robust growth.

Regional Resilience and "Just Growth"

We have been among those suggesting that an emphasis on regional equity is not simply about fairness but might also have positive impacts on economic growth (Boushey & Hersh, 2012; Treuhaft, Blackwell, & Pastor, 2011). Just as some of our earlier economic work essentially borrowed from international literature on this question (Pastor & Benner, 2008; Pastor, Jr. et al., 2000), we have borrowed here from a recent focus by economists at the International Monetary Fund on not the rate of growth but the length of growth. To some extent,

the findings in this study offer further evidence for pro-equity proponents: in Cox regressions on the length of growth spells for nearly 200 metropolitan regions over the last two decades, we find that the largest and most significant predictor of shortening a growth spell is the level of inequality, a result quite close to the findings in the international literature we mimic.

Also of interest are the results for the measure of regional political institutions as well as residential segregation. The more that power is spread throughout the region (at least as measured by the index we employ and with all the other controls in place), the more likely the region is to fall out of a growth spell.[12] Similarly, higher levels of residential segregation are associated with shorter growth spells. As in much of the international and comparative literature, social distance – measured here in three different ways – is bad for sustaining growth.

There are other factors, of course, including education levels, economic structures, and institutions, that are important to maintaining growth. But the headline of this work in terms of both reliable significance and relative novelty is that regions that are more equal and integrated—across income, race, and place—are better able to sustain growth over time.

In our view, this raises two immediate questions. The first is that this work provides little insight into the actual processes that connect equity and growth spells. Our on-going qualitative work on links between equity and economic growth may provide insights that might shed light. Our case study research of 'just growth' regions suggests the importance of efforts to create diverse epistemic communities(Adler & Haas, 1992) —that is conscious efforts to develop a shared understanding of the region amongst diverse constituencies (Benner & Pastor, 2012). Our hypothesis is that these diverse knowledge communities facilitate a region's ability to both better

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[12] It is worth nothing that recent work by Grassmueck & Shields finds that local government decentralization within regions is associated with a more rapid pace of growth (Grassmueck & Shields, 2010). Understanding the different facts shaping pace and length of growth spells seems worthy of significant further research.

identify growth opportunities and to respond collectively to those opportunities quicker and with less social and political conflict – in short, that knowing together contributes to growing together (Benner & Pastor, 2014).

The second question is also immediate: if equity may be good for growth, why doesn't everyone get it and turn more regional attention to ameliorating inequality and spreading opportunity? Of course, part of the political economy reason is that some do benefit (relatively). But another reason harkens back to the international finding in Dymski and Pastor (1991) that rising inequality was a "misleading signal": in contrast to any other variable tested, it was associated with prompting banks to lend more money to Latin American countries but it was also associated with those countries being more likely to fall in a debt crisis where they stopped payments.

Many economists did not like those results when we presented them then (maybe that's why we turned to studying domestic economies instead). After all, bankers are supposed to be the epitome of market-based rational expectations and it was simply unthinkable that they might make systematic mistakes. After having dragged us through multiple waves of overlending to the developing world, presiding over the meltdown of the savings and loan industry, and finally crashing the world economy with a combination of subprime loans, credit default swaps, and packaged derivatives, one might think the idea of a rational financial sector would now be, let's say, worthy of further questioning. But mustering evidence to change views can be difficult in the face of "deep priors" – considering the continuing faith that tax cuts will produce supply-side growth or the revelation that in 2012, 30 percent of Republicans believed that President Obama was born abroad, up from 16 percent in 2008 (M. Scherer, 2012).

Priors only shift with major changes in scientific paradigms, when the evidence finally becomes so strong that there is a sort of "breakthough" in which the norms and precepts move dramatically and broadly across a knowledge community (Kuhn, 2012). Such change is not really incremental and the rapid swing in views can seem surprising; for contemporary and perhaps more easily grasped examples, consider the rapidly shifting politics of and attitudes about immigration reform. So perhaps this is the link between our qualitative studies of regional epistemic communities and this quantitative work: those knowledge communities help to achieve regional breakthroughs that can develop a sense of shared fate and interwoven destinies.

Of course, we would be among the first (some of you are jumping there already) to admit that the evidence to date is suggestive, perhaps at best. But we think the theoretical logic is strong and that it will be a matter of time until further evidence emerges (from us and hopefully others as well) of the potentially positive impacts of equity on growth and the importance of diverse knowledge communities in linking growth and equity. We would also suggest that the evidence here suggests that there may be similar underlying processes contributing to sustaining growth over longer periods as well. Whatever the underlying processes, our evidence does suggest that more equitable, integrated and spatially connected regions – which we might prefer for other reasons as well – may also be able to achieve more sustainable growth.

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