Brother, can you spare some time? Sustaining prosperity and social inclusion in America's metropolitan regions

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*Urban Stud* published online 5 September 2014
DOI: 10.1177/0042098014549127

The online version of this article can be found at:
http://usj.sagepub.com/content/early/2014/09/03/0042098014549127
Brother, can you spare some time? Sustaining prosperity and social inclusion in America’s metropolitan regions

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Abstract
Understanding the factors and processes that help regions sustain economic growth has become a topic of increasing interest in recent years. We examine factors associated with the length of ‘growth spells’ for the 184 largest regions in the United States from the period 1990–2011. We find 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 middle education levels. However, we also find that the length of growth spells is strongly related to lower levels of metropolitan income inequality and to measures of social and spatial segregation, suggesting that more equitable and more integrated regions are better able to sustain growth.

Keywords
economic growth, growth spells, regional equity, resilience, social inclusion

Received June 2013; accepted November 2013

Introduction
Since the early 1990s, a growing body of research has been documenting links between social equity and economic growth at a metropolitan scale in the United States. Different measures of equity have been considered, including income inequality, racial inclusion, and spatial segregation by race, income or jurisdiction, with the general pattern being that social equity is correlated with – and, in some of the work, causally related to – economic growth.

In all these studies, the focus has been on the pace of growth. But researchers have recently turned their attention to ‘resilience’ or the capacity of regions to maintain growth paths in light of external shocks (Foster, 2012). Testing for economic resilience 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 complicated to measure (Hill et al., 2012).

Fortunately, an analogue in the international literature may provide some guidance to testing for resilience. Turning to that literature makes sense: much of the early work on the relationship between equity and metropolitan growth was actually inspired by findings in the development literature that countries with more equal distributions of income tended to grow faster and/or withstand macroeconomic shocks. Conveniently, recent work by researchers at the International Monetary Fund (IMF) has focused on not just the growth rate but also the ability to sustain growth over an extended period (Berg and Ostry, 2011; Berg et al., 2012). They argue that lengthening ‘growth spells’ is especially critical for poor countries of the world, partly because countries with more sustained growth spells may create an environment where investors feel more secure about the future, facilitating a virtuous cycle. Most relevant to our work here: the IMF authors 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 is also of critical interest in the US. 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 and Varian, 1998). One of the critical dimensions of building resilient regions is surely the ability to sustain economic growth, however slow, in the face of such economic restructuring.

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? 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 1990–2011. 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 middle education levels. But of most interest here is that growth spells seem to be 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) a higher level of income inequality.

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 results. As with Berg et al. (2012), this is 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 the challenge these results pose to traditional economic paradigms.

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 (Kaldor, 1977; Kuznets, 1955). Yet the notion that a less skewed distribution of income could kill the engine of economic vitality was challenged by a wave of multivariate and multi-
country studies conducted in the 1990s and early 2000s (see Aghion et al., 1999 for a review). Alesina and Perotti (1996), for example, argued that inequality leads to social tension and political instability, thus lowering certainty, investment, and economic growth. Rodrik (1999) 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.

Some authors argue for a longer-term political economy view, suggesting that when access to productive resources is more equal, the median voter will perceive that s/he may benefit from growth and so be more interested in protecting property rights and a favourable investment climate (Alesina and Rodrik, 1994; Persson and Tabellini, 1994). 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 or more widespread access to finance (Birdsall et al., 1995; Deninger and Squire, 1996).

As for economic sustainability per se, Dymski and Pastor (1991) provided an early view of the role of equity with their study of the relationship between bank lending and debt crises in Latin American countries. In that work, they found that those countries that were more unequal in their distribution of income tended to be favoured by private lenders (accounting for other factors such as GDP growth and trade openness) but that those countries were also more likely to experience payments crises later on. Since all the other factors that had a positive effect on lending also had a negative effect on crises, they labelled 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 relationship between higher inequality and less sustainability was not well-recognised (a point to which we return in the conclusion).

**Equity and economic growth in America’s metropolitan areas**

It is only recently that the notion of a positive relationship between equity and long-term growth – beyond the usual Keynesian notions about the stimulative effects of placing money in the hands of less well-off consumers – has made its way into the discussion of the overall US economy (Boushey and Hersh, 2012; Stiglitz, 2012). However, 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 US metropolitan regions. Early studies of the equity-growth relationship paralleled the findings in the international development field but paid insufficient attention to multivariate controls and issues of simultaneity (Gottlieb, 2000). Both Voith (1998) and Pastor et al. (2000) attempted to address these issues, with Voith finding a positive association of suburban growth with city growth and Pastor et al. finding that various measures of inequality had a negative impact on per capita income growth over the 1980s in 74 regions, even with multivariate controls and considerations of simultaneity (Pastor et al., 2000; Voith, 1998).

Examining 341 regions in the US and controlling for other variables that should promote growth, Pastor later found that real per capita income growth was negatively affected by such distributional measures as the ratio of city to suburban poverty, the
percentage of poor residents in high poverty neighbourhoods, 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 (2008) found that the dragging effect of inequality on growth held even in what might be termed ‘weak market’ metros – places where some would say that anaemic growth is an excuse for making attention to equity a sort of luxury concern.

Federal Reserve economists conducted a related analysis for nearly 120 metropolitan areas throughout the US (Eberts et al., 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 US metros has looked 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, and a growing body of literature has tried to explain both what helps countries shift from economic decline towards economic growth, and what causes an end to growth periods (Aguiar and Gopinath, 2007; Hausmann et al., 2005; Hausmann et al., 2006; Jerzmanowski, 2005; Jones and Olken, 2008; Pattillo and Gupta, 2006; Rodrik, 1999).

Recent work by IMF researchers has looked specifically at what is important in explaining a country’s ability to sustain economic growth and forestall a downturn (Berg et al., 2012). To do this, the authors first identify a total of 104 distinct ‘growth spells’ (periods of at least five years of annualised growth) 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 fractionalisation; social and physical indicators; levels of financial development; levels and types of globalisation; patterns of current account, competitiveness and export structure; and patterns of macroeconomic stability.

Perhaps unsurprisingly, external shocks and macroeconomic volatility are associated with shorter growth spells while ‘good’ political institutions are associated with longer growth spells. The authors also utilise a variety of other indicators – including competitive exchange rates, external capital structures weighted towards foreign direct investment, and export product sophistication. But what is particularly interesting for our work – 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’ (Berg et al., 2012: 160).

We have seen no similar studies of the length of growth spells in the US; the work of 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. While the general focus of the literature on overall growth rates is understandable, in recent years, researchers have come to appreciate that spells of unemployment, for example, have lasting effects on people’s lifetime earnings long after they are once again able to secure employment (Mroz and Savage, 2006) and that the lasting effects also include psychological distress and decline in life satisfaction (Daly and Delaney, 2013). There is also evidence that new graduates entering the labour market during a recession also experience long-term earnings declines when compared with those entering the labour market during growth periods (Kahn, 2010; Oreopoulos et al., 2012).

We thus focus here on sustained growth or ‘growth spells’. We acknowledge that many researchers and policy advocates question whether growth – either its rate or its length – is the best metric for understanding economic well-being. The Genuine Progress Indicator, for example, tries to account for the value of unpaid labour and subtracts the value of environmental pollution from economic growth figures (Hamilton, 1999; Lawn, 2003; Talberth et al., 2006). The Human Development Index provides a more comprehensive picture of socio-economic welfare, and a number of indicators incorporate subjective measures of happiness and social well-being (Abdallah et al., 2012; Bates, 2009; Sagar and Najam, 1998). We support this broadening of the research agenda but we also think that growth spells matter for people’s lives and that is our focus here.

**Explaining sustained metropolitan growth in the US**

**Defining growth spells**

As noted above, much of the previous work on the relationship between metropolitan equity and growth was inspired by work being conducted in the developing country context – and we follow suit here. Building on the work of Berg et al. (2012), we decided to examine growth spells in the largest 184 metropolitan regions in the US (all CBSAs (Core Based Statistical Areas) that had a population of 250,000 or more as of the 2010 census). 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 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 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. We resulted with a database that included 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).²

Do growth spells really matter? One might argue that the length of growth is of little consequence – perhaps a ‘boom and bust’ economy is volatile but it will deliver high employment and wages over time. Table 1 takes the 181 regions which had growth spells and breaks them into categories based on the number of quarters in the overall period that a region was in a growth spell; the categories are chosen to create bands that are non-arbitrary but somewhat similar in terms of the number of regions that falls in each and the basic results are not sensitive to our particular choice of bands. Note that the minimum is 12 – one needs that to have experienced a growth spell at all – and the maximum that any region spent in growth spells over the whole period is 70 quarters. We then calculate the growth in employment and real weekly earnings (also from the QCEW data) over the whole period. The data suggest that more time in growth spells generates more overall employment growth and generally higher earnings (although the earnings effect seems to taper off in the higher bands).³

Table 1. Growth spells and regional outcomes.

<table>
<thead>
<tr>
<th>Number of quarters in growth spells</th>
<th>Number of regions in category</th>
<th>Employment growth over whole period</th>
<th>Growth in real weekly earnings over whole period</th>
</tr>
</thead>
<tbody>
<tr>
<td>12–20</td>
<td>18</td>
<td>6.0%</td>
<td>6.5%</td>
</tr>
<tr>
<td>21–30</td>
<td>17</td>
<td>10.7%</td>
<td>15.1%</td>
</tr>
<tr>
<td>31–40</td>
<td>25</td>
<td>17.3%</td>
<td>14.0%</td>
</tr>
<tr>
<td>41–50</td>
<td>31</td>
<td>19.8%</td>
<td>20.2%</td>
</tr>
<tr>
<td>51–55</td>
<td>23</td>
<td>22.9%</td>
<td>19.1%</td>
</tr>
<tr>
<td>56–60</td>
<td>31</td>
<td>43.3%</td>
<td>20.6%</td>
</tr>
<tr>
<td>61–70</td>
<td>36</td>
<td>61.2%</td>
<td>22.1%</td>
</tr>
</tbody>
</table>

Table 2. Growth spell outcomes.

<table>
<thead>
<tr>
<th>Length of growth period</th>
<th>Number of growth periods in each category</th>
<th>Annualised employment growth</th>
<th>Annualised growth in real weekly earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–4</td>
<td>332</td>
<td>2.7%</td>
<td>-0.8%</td>
</tr>
<tr>
<td>5–11</td>
<td>167</td>
<td>1.9%</td>
<td>1.0%</td>
</tr>
<tr>
<td>12–16</td>
<td>70</td>
<td>2.2%</td>
<td>0.7%</td>
</tr>
<tr>
<td>17–20</td>
<td>69</td>
<td>2.2%</td>
<td>0.8%</td>
</tr>
<tr>
<td>21–28</td>
<td>73</td>
<td>2.6%</td>
<td>0.9%</td>
</tr>
<tr>
<td>29–38</td>
<td>67</td>
<td>2.9%</td>
<td>1.3%</td>
</tr>
<tr>
<td>39–69</td>
<td>45</td>
<td>4.2%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>1.0%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

What about the impacts on employment and earnings of the spells themselves (rather than the length of time any particular region spends in a spell)? Table 2 shows those results; note that the longest single growth spell was 69 quarters (Go, Ogden, Utah!) and that the number of growth spells ranging from 12 to 69 is the 324 discussed earlier. One feature of Table 2 is that we are also able to offer a view of performance for periods which fall out of growth before our 12
quarter mark for a ‘growth spell’. There are 332 growth periods where growth occurred for less than a year; these were indeed booms with high employment growth on an annualised basis but since they are associated with declining earnings and immediately fell into recession (and since growth spells are associated, as in Table 1, with better growth for a region over the long haul), it’s hard to see why this is a desirable outcome. Starting from growth periods that run from 5 to 11 quarters, we see that annualised employment growth generally rises with the length of the growth spell; the increase in real earnings also improves in longer growth spells (starting from 12 quarters on) but the effect is seemingly less strong. Note that the overall employment growth figures are lower than for any of the categories; that is because the overall figures include years in which employment is falling. The overall message from these tables: longer growth spells are associated with faster growth and higher employment outcomes over time, with earnings showing a similar but weaker relationship to the length of growth spells.

Methodological approach

If growth spells are good, what determines their length? In their country-level analysis, Berg et al. (2012) look at a range of indicators, some of which – like 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 US and thus are not appropriate for an analysis of regional growth spells. We wind up categorising our variables into the following domains: external shocks and vulnerability; political fragmentation; inequality and separation; social indicators; and economic structure and institutions.

Aside from similar domains, another way in which our approach parallels Berg et al. (2012) is that this is an exploratory exercise. Berg et al. state:

We sequentially test the relevance of particular regressors of interest, while including some minimal controls … At the end, we summarise 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. (2012: 152)

We follow suit, first looking at individual regressors and then combining them and offering one more parsimonious specification. While, like Berg et al. (2012), this approach is somewhat unorthodox (there is no strong model specification prior to exploration), we do offer heuristic rationales for our variables and view this initial work as setting the stage for future quantitative and qualitative 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 around .20; the idea is to point to relationships for which further research will be needed.

The testing technique specifically used in this exercise is a Cox regression, a particular type of survival analysis regression method. In our case, we are trying to see which factors are associated with an early exit from sustained growth. 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.

One key issue in hazard analysis 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 was continuing at the end of our time-period of analysis (nearly every region eventually got knocked off its growth path by the Great Recession; some did recover more quickly than others but there was not enough time to complete a growth spell). However, we also face another issue: the data for our analysis start in 1990 and thus the first complete quarter of year over year growth is in 1991, and 29 out of our 324 growth spells date their first quarter then. We thus know a minimum length of these 29 growth spells, but not the actual full length. This differs from 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 and 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 ran 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 the growth spell did actually begin at the beginning of our time-period (which may not be problematic since the US was coming out of a national recession in that time period). There were only minor differences in the regression results so we present the findings below for the entire sample.

Finally, in terms of right-hand side variables, unless indicated, these came from a database assembled for the Building Resilient Regions 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 data.)

Base regression specification

In all of our regressions, we include dummy variables for census region (as did Hill et al., 2012) and we also include both regional per capita income and a measure of metro size as controls. Regional per capita income is included partly because a parallel starting income measure is used in Berg et al. (2012); moreover, the regional economic convergence literature generally controls for initial regional income to account for convergence to the mean (see the discussion and parallel construction for growth equations in Pastor et al., 2009). The coefficients on initial income, which we do not report to conserve space, always pointed in the appropriate direction (higher per capita income is associated with shorter growth spells) and remain significant in our full specification (similar to the results in Berg et al., 2012). 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, the log of the metro population normed relative to the sample, is similar to the metro size variable used in a recent effort by Li et al. (2013).

These and all other variables (with one exception detailed immediately below) are meant to capture initial conditions as the growth spell begins. 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).

**External shocks and vulnerability**

An external shock, such as a national recession, is one of the most likely factors to end a growth spell. We consider here the percentage of total quarters within the growth spell in which the national economy was in recession. Our notion is that the longer the spell has been impacted by the recession, the more likely it is to fall out – and the results are significant at the .10 level with the expected sign (in the tables that follow, any result that is significant to at least the .20 level is bolded) (see Table 3). Again, recall how one should read these coefficients: the 1.018 coefficient indicates that, holding all other covariates constant, an increase of one unit (in this case a percentage point increase in the share of the region’s growth spell that the nation is in an overall recession) is associated with a nearly 2% increase in hazard (or likelihood) of growth ending.

Another way to get at external vulnerability is to consider the likely impacts of globalisation. For this, we calculated the proportion of gross regional product accounted for by international exports with data taken from the Department of Commerce. 2005 was the first year for which we had the export data and we averaged the years 2005 to 2010 to smooth out yearly variations and instead catch the overall structure. This is a highly imperfect measure, partly because it is taken from the end of the period rather than before, a failing to which we simply plea that we had no other such variable available to us for the earlier periods. The direction is as expected – a higher share of exports is associated with a greater hazard of falling out of a growth spell – and is significant at the .03 level.

**Political fragmentation**

There is now a voluminous literature suggesting that regional collaboration may be important for promoting economic competitiveness (Cooke and Morgan, 1998; Martin et al., 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 and inefficient public investments (Rusk, 2003). On the other hand, some recent research has suggested that fragmentation, perhaps because it promotes Tieboutian competition, can be consistent with more rapid growth (Grassmueck and Shields, 2010). Whatever the perspective, it is clear that metropolitan fragmentation may be implicated in growth outcomes.

However, measuring such fragmentation can be difficult. Some researchers simply count the number of governments in a metro region, either in absolute terms or on some per capita basis (Dolan, 1990; Goodman, 1980; Grassmueck and Shields, 2010; Ostrom et al., 1974). A second approach, most prominently represented in the Hirshmann-Herfindal Index, considers 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 and Shields, 2010; Scherer and Ross, 2009). A third and newer approach, developed by David Miller of the University of Pittsburgh, builds on this Hirshmann-Herfindal Index approach but

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**Table 3.** External shocks and vulnerability.

<table>
<thead>
<tr>
<th></th>
<th>Hazard ratio</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of growth spell in national recession</td>
<td>1.018</td>
<td>0.09</td>
</tr>
<tr>
<td>Exports as % of GMP</td>
<td>1.011</td>
<td>0.03</td>
</tr>
</tbody>
</table>

*Note: The variables are presented in a single table for convenience, but each was entered separately.*
also incorporates the number of jurisdictions in the region (Hamilton et al., 2004; Miller and Lee, 2009). The resulting Metropolitan Power Diffusion Index (MPDI) is available for all metropolitan areas in 1987, 1997 and 2007, and is derived by using the square root of the percentage contribution to total regional expenditures, rather than the square, a process that gives greater mathematical value to the smaller units.

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 – more diffuse regions are more likely to fall out of a growth spell – albeit at the .15 significance level (see Table 4). As we will see later, the statistical significance improves slightly when MPDI is included in regressions with a range of other indicators, suggesting political fragmentation might be a drag on sustained growth.

### Inequality and social separation

Following Berg et al. (2012), we use the Gini coefficient to look at the role of inequality in shaping growth spells, deriving the measure from metropolitan household income data from the decennial census. We also looked at the size of the ‘minority middle class’, considering the proportion of African–American and Latino households that are in the middle income brackets for the region, first separately, then combined; below, we just present results for the combined measure to save space. We also wanted to look at issues of social separation so we considered a standard measure of residential segregation called the dissimilarity index, in this case calculated in terms of non-Hispanic whites and everyone else, as well as the ratio of city to suburban poverty rates.

As shown in Table 5, the Gini coefficient turns out to be extremely significant 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. Our various minority middle class variables were significant; to conserve space, we show only the combined measures which suggest that regions with a higher percentage of minorities in middle class income brackets are more likely to have longer growth spells. The dissimilarity index results suggest that more segregated regions have shorter growth spells; a higher city–suburb poverty differential is also associated with shorter growth but the result is significant only at the .23 level.

### Social indicators

In addition to inequality and social separation, we sought to look at educational attainment and levels of immigration. 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

<table>
<thead>
<tr>
<th>Table 5. Inequality and social separation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard ratio</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Gini coefficient (initial level)</td>
</tr>
<tr>
<td>% disadvantaged minority households in middle income brackets</td>
</tr>
<tr>
<td>Dissimilarity index, non-Hispanic whites</td>
</tr>
<tr>
<td>Ratio, principal city to suburban poverty rates</td>
</tr>
</tbody>
</table>

Note: The variables are presented in a single table for convenience, but each was entered separately.
degree but less than a bachelor’s degree; the default category is the proportion of the population with less than a high school degree. For immigration, we looked at the percentage of the foreign-born (immigrant) population in each region.

The results are shown in Table 6. Of our two education measures, the proportion of the population with at least a high school degree but less than a bachelor’s degree is statistically significant (at the .03 level) with regions with a larger proportion of the middle-educational population being less likely to fall out of a growth spell. The proportion of immigrants in the region also has a significant (shortening) relationship to the length of growth spell, perhaps reflecting the sort of ‘immigrant shock’ discussed by Pastor and Mollenkopf (2012).

### Employment structure and institutions

We also looked at three broad measures of industrial structure in the region, namely the percentage of workforce employed in construction, in manufacturing, and in public administration, as well as one set of economic institutions, the percentage of the workforce covered by unions. As shown in Table 7, the percentage of employment in public administration is associated with longer growth spells; manufacturing and construction, each entered alone, do not have a significant impact on the length of growth spells. The unionisation variable is associated with shorter growth spells but the result is not significant.

### Integrated model

Having looked at each of these indicators separately, we now combine them into a single regression; as with the individual regressions, we include controls for census region, per capita income and metro size. There are two things to mention before looking at the results. First, we included only one educational attainment indicator, due to obvious high levels of collinearity; we chose the one that was significant in the stand-alone regression. Second, in our initial integrated regression, we found that that variable, indicating a broadly educated middle, was actually associated with shorter growth spells, the opposite of its impact in a univariate context. Since this shift was unusual, we investigated and found with the economic structure variables and our educational indicator alone, a broadly educated middle was associated with longer growth spells (as we found when it was entered alone), albeit at the .20 level. However, the sign on education flipped when we introduced the Gini coefficient – sensible given that inequality would likely be

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**Table 6. Social indicators.**

<table>
<thead>
<tr>
<th>Hazard ratio</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult population with BA degree or higher</td>
<td>1.010</td>
</tr>
<tr>
<td>Adult population with HS to AA degree</td>
<td>0.975</td>
</tr>
<tr>
<td>% of population foreign born</td>
<td>1.029</td>
</tr>
</tbody>
</table>

*Note: The variables are presented in a single table for convenience, but each was entered separately.*

**Table 7. Economic structure and institutions.**

<table>
<thead>
<tr>
<th>Hazard ratio</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% employment in public administration</td>
<td>0.954</td>
</tr>
<tr>
<td>% employment in manufacturing</td>
<td>1.004</td>
</tr>
<tr>
<td>% employment in construction</td>
<td>0.971</td>
</tr>
<tr>
<td>% of workforce covered by a union contract</td>
<td>1.003</td>
</tr>
</tbody>
</table>

*Note: The variables are presented in a single table for convenience, but each was entered separately.*
larger if there was a lower level of what might be considered mid-level education.

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 BA. With the regression weighted by metro population to give a better sense of the overall relationship, we 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.12

The Cox regression results with that modified Gini coefficient are shown in Table 8. The first set of columns include all the variables tested above, while the second set of columns drops the three least significant measures. Note first that once we have accounted for all these structural variables, the percentage of the growth spell during which the nation has been in recession is no longer significant. The export variable is also insignificant but this measure is, as we have suggested, imperfect given its timing. However, both metropolitan diffusion and higher levels of inequality are associated with shorter growth spells and the effects are very significant.

The percentage of minorities in the middle class is not significant at all, presumably because of competition with the two residential segregation measures, the dissimilarity index and the city–suburb poverty ratio. Also associated with shorter growth spells were the percentage 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 percentage of the population with a middle level of education. Although the percentage in public administration was associated with longer growth spells when entered on its own, it is now associated with shorter growth spells (although with a relatively low significance level); it may be that while public sector employment can strengthen the middle class and dampen inequality and extend growth spells for that reason, when entered into a regression where inequality is a direct measure and other dynamic aspects of the economy are accounted for, a larger

<table>
<thead>
<tr>
<th>Table 8. Integrated model with GINI residual.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full model</strong></td>
</tr>
<tr>
<td><strong>Hazard ratio</strong></td>
</tr>
<tr>
<td>% of growth spell in national recession</td>
</tr>
<tr>
<td>Exports as % of GMP</td>
</tr>
<tr>
<td>Metropolitan Power Diffusion Index (MPDI)</td>
</tr>
<tr>
<td>Gini coefficient (residual)</td>
</tr>
<tr>
<td>% minority middle class</td>
</tr>
<tr>
<td>Dissimilarity index, non-Hispanic white</td>
</tr>
<tr>
<td>Ratio, principal city to suburban poverty rates</td>
</tr>
<tr>
<td>Adult population with HS to AA degree</td>
</tr>
<tr>
<td>% of population foreign born</td>
</tr>
<tr>
<td>% employment in public administration</td>
</tr>
<tr>
<td>% employment in manufacturing</td>
</tr>
<tr>
<td>% employment in construction</td>
</tr>
<tr>
<td>% of workforce covered by a union contract</td>
</tr>
</tbody>
</table>

Note: Variables entered in multivariate fashion.
public sector signals a more rigid economy.\textsuperscript{13} A similar argument could be made for the shortening impact – albeit insignificant – of unionisation (although this might also be associated with an older industrial structure).

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).\textsuperscript{14} This suggests that inequality does indeed have a dampening impact on growth spells – although one important caveat to stress is that this is an exercise covering 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, that there is a U-shaped relationship in which ‘perfect’ equality destroys incentives and hurts economic expansion while more extreme levels of inequality manage to do the same for the reasons discussed earlier. From this perspective, it may simply be that we are past a sort of ‘peak’ level of inequality in contemporary America – and that we need to rebalance 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 and Hersh, 2012; Treuhaft et al., 2011). Just as some of our earlier economic work essentially borrowed from international literature on this question (Pastor, 2006; Pastor and Benner, 2008), we have borrowed here from a recent focus by economists at the International Monetary Fund on not the rate of growth but the sustainability of growth. As it turns out, 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 level of metropolitan political fragmentation and residential segregation by race and income. There are other factors, of course, including education levels and economic structures and institutions, that are important to maintaining growth. But the punchline of this work is that regions that are more equal and more integrated – across income, race, and place – are better able to sustain growth over time.

If equity may be good for growth, why don’t regional policymakers pay even more attention to ameliorating inequality? Of course, part of the political-economy reason is that some do benefit (relatively) from less equitable distributions of opportunity. But another reason harkens back to the international finding in Dymski and Pastor (1991) that rising inequality was a ‘misleading signal’, prompting banks to lend more money to Latin American countries even as those were exactly the same countries more likely to fall in a debt crisis where they stopped payments.

At the time those results were presented, many economists objected – after all, bankers were considered the exemplar of market-based rational expectations and it stretched the neo-classical imagination to suggest that financiers might make systematic mistakes. In the wake of multiple waves of over-lending to the developing world, the meltdown of the savings and loan industry, and a worldwide crash due to a combination of subprime loans, credit default swaps, and packaged
derivatives, the idea of a rational financial sector is, let’s say, at least worthy of further questioning. But mustering evidence to change deeply held ‘priors’ can be difficult – consider the continuing faith that tax cuts will produce supply-side growth or the revelation that in 2012, 30% of Republicans believed that President Obama was born abroad, up from 16% in 2008 (Scherer, 2012).

Priors only shift when the evidence finally becomes so strong that there is a sort of ‘breakthrough’ in which the norms and precepts move dramatically and broadly across a knowledge community (Kuhn, 2012). The evidence here is tentative but we hope that it will encourage both more research and further theorising about whether 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.

Acknowledgements

We would like to thank Justin Scoggins from the Program for Environmental and Regional Equity at USC for his assistance with the data analysis. We would also like to thank the anonymous reviewers and the members of the Building Resilient Regions network, particularly Hal Wolman, for their helpful and constructive comments.

Funding

We would like to thank the Institute for New Economic Thinking (grant no. 5409), The Ford Foundation and The MacArthur Foundation, for their financial support that helped enable this paper.

Notes

1. See also the working paper by Levine et al. (2010) which looks at the effects of income inequality on ‘expenditure cascades’ and finds that US counties with the highest levels of income inequality were most likely to experience financial distress.

2. While this is the full sample, we lacked key variables for all 181 regions. We were, for example, unable to calculate Gini coefficients for 10 smaller CBSAs (less than 500,000 population), and unionisation rates for 15 smaller CBSAs are not reported. In regressions with those variables, we are actually analysing 287 growth spells in 160 regions.

3. For the three cases without any growth spells, average employment and wage growth were relatively high but that was due to averaging one spectacular performer, one dismal performer and one middle-range performer.

4. 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 to readers and because the Cox procedure is built into 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.

5. See http://brr.berkeley.edu/.

6. An addition, the gross regional product measure used as the numerator is taken from another source and so we get some unrealistically high export shares; we logged the variable to reduce that problem and get a more normal distribution but the result made little difference to the regression outcomes and was not parallel with the other share variables utilised later; hence, we report on the results for the straightforward share measure.


8. In particular, we used data on household income from the 1990 and 2000 5% Public Use Microdata Samples (PUMS), applying trapezoidal integration to calculate the Gini coefficient for each year.

9. We used categorical household income information by race of householder from...
the 1990 and 2000 censuses, and defined the middle class to include households with income between 80% and 120% of the overall regional median. All households falling in income brackets entirely contained within the resulting income boundaries for the middle class were included, and, for the income brackets ‘split’ by the income boundaries, linear interpolation was used to estimate the number of households in such brackets falling in the middle class.

10. The ratio is calculated for the so-called principal cities of a metro area relative to other areas.

11. Most economic institutions do not vary substantially from region to region across the US, or are difficult to capture quantitatively (such as economic development strategies). There are some state-level differences, such as minimum wage legislation or right-to-work legislation (used, for example, in Hill et al., 2012) but with multiple metro-regions in single states, and some metropolitan regions crossing multiple state boundaries, it seemed more appropriate to consider economic institutions that did vary by region: the percentage of unionisation.

12. We re-ran 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).

13. 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 virtually 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 equalled 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 percentage of the workforce in construction, a sensible turn of events given the role that sector played in the most recent downturn.

14. As noted earlier, 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 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 growth-shortening effect of the share of the population with a BA or better was more significant (although the high school to AA variables were still growth-promoting and much more significant). In the integrated model, virtually everything was identical in terms of significance level with a few minor 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.

References


