

Religiosity and Regional Resilience to Recession

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Literature shows that religiosity can provide individual resilience to life shocks as well as regional resilience to disasters caused by natural hazards. Related work has examined the complicated links between religion and economic growth. Yet few, if any, studies examine the role of regional levels of religiosity on a region's resilience to recession—or how quickly the employment rate returns to pre-recession levels (a common measure of resilience in the economics literature). As the recovery period of the Great Recession cools and economists warn of future economic downturns, all known variables that may be linked with regional resilience are worthy of exploration. Using survey results from the Gosling-Potter Internet Project and General Social Surveys, we applied logarithmic functions to pre- and post-Great Recession employment data for 2,836 U.S. counties. We found a modest and statistically significant association between religious belief and regional resilience to recession. Religiosity was the strongest of sixteen psychosocial variables that we examined in association with the speed of job recovery; despite having negative links with other economic variables. This has particular salience for more rural economies; policy implications are discussed.

KEY WORDS: resilience to recession, economic shock, religiosity, recovery policy

Introduction

Whether it is a hurricane, oil spill, or an economic recession, individuals residing within a region can find themselves facing a new and unexpected reality. How they confront and deal with their circumstances varies by individual beliefs, community dynamics, and regional characteristics. While religious belief is often credited with helping individuals overcome adversity, studies on the impact of regional levels of religiosity on adversity recovery have not been studied extensively, especially as it pertains to economic recessions. The Great Recession ended in 2009, and now a decade has transpired as the economy has entered into what has become the longest bull market in U.S. history. However, increasing volatility has led many economists to begin

All names are in alphabetical order.

predicting that the next downturn is looming (Bump, 2019). In preparation for the potential of another recession, research on the impact of less understood variables on regional resilience to recession are in order—our study contributes to that effort, identifying religiosity as a standout among a set of psychosocial variables.

In this paper, we examine the relationship between regional religiosity (defined as a county's average score on survey questions about religious belief and practice on the General Social Survey) and resilience to recession across 2,836 U.S. counties following the Great Recession of 2007/08. It should be noted that we define “resilience to recession” in accordance with the definition used to construct the variable used in our analysis, originally from Han and Goetz (2015), as having the employment rate, which would have occurred if the pre-recession expansion had continued in place of the recessionary drop and rebound. Similar definitions have been used in the economics literature for some time, such as Christopherson, Michie, and Tyler (2010) acknowledgment that resilience has a range of definitions but, “in economics, resilience has been defined in terms of return to a fixed and narrowly defined equilibrium (as measured by employment, for example)” (p. 1). It should also be noted that we focus our discussion on the resolute regions at the county level, rather than more macroscopic national subdivisions. This paper comes as a portion of a larger study on the links between sixteen hand-picked psychosocial variables (e.g., views toward science, views toward gender roles, personality traits) with reasonable literature to hypothesize associations, and their impact on multiple economic outcome variables. While religiosity was negatively associated with some economic variables like per capita income and unemployment levels, it was the standout variable linked to the speed of job recovery at the county level after the Great Recession. In this paper, we explore possible linkages behind this surprising finding.

Literature on the Links Between Religiosity and Resilience

Religiosity and Individual Resilience to Life Stressors

Extensive work examines the links between religiosity and the generally positive impact it has on *individual's* resilience to life's stressors. For example, among college students, scoring high on a scale of religious belief was positively associated with scoring higher on a scale of resilience (Javanmard, 2013). Similarly, Mosquero, da Rocha, and Fleck (2015) found that depressed patients who had previously attempted suicide, but who also had high intrinsic religiosity, were discharged with higher resilience scores than those with low intrinsic religiosity. Attendance at religious services appears to help reduce the odds of mood disorders (Kasen, Wickramarante, Gameroff, & Weissman, 2012). Placing high importance on religion or spirituality is linked to a thicker cerebral cortex, possibly expanding a cortical reserve against familial depressive illness (Miller et al., 2014). The effect between spirituality and resilience appears to function across the lifespan, with studies

finding links among adolescents (Kim & Esquivel, 2011), young adults (Rounding, Hart, Hibbard, & Carroll, 2011), and the elderly (López, Camilli, & Noriega, 2014).

Religiosity and Group Resilience to Life Stressors

Moving beyond the individual and toward group dynamics, the link between spirituality and resilience is not exclusive to a single religion or denomination. In other words, it matters not what form the belief takes (e.g., Judaism, Presbyterianism) but merely that the belief exists. While subjects in U.S. studies of religiosity tend to be Christian, similar results have been documented for Muslims, such as Narayanan and Abeer's study (2011), which found a positive relationship between practicing Islam and scores on a resilience inventory. Studies of exposure to war and terror have found links between religiosity and resilience among Buddhists and Christians (Fernando & Ferrari, 2011), confirming a statistically significant relationship between inventories about religious practice and resilience. Conversely, in one study of Israelis who had experienced acts of terror, a more secular outlook was associated with greater individual resilience (Hobfoll et al., 2009), while another study of Israelis found greater religiosity to be associated with stronger views of community and national resilience (Kimhi, Goroshit, & Eshel, 2013).

Religiosity and Regional or Community Resilience to Disaster

Studies of regional disasters—whether natural events (earthquakes, floods, etc.) or social events (cyber-attacks, riots, etc.)—also show connections between religiosity and resilience. For example, Dahlberg, Johannessen-Henry, Raju, and Tulsiani (2015) pointed out the positive role of community infrastructure in meeting local needs following a disaster; while this certainly includes non-religious functions like federal plans and strong infrastructure, it also involved religiosity-related components like pastoral care for trauma counseling and church facilities being converted to community centers for shelters or government aid deployment. Similarly, Rivera and Nickels (2014) speak of the valuable role the Mary Queen of Vietnam Catholic Church played in the disaster recovery of a New Orleans community devastated by the 2005 impacts of Hurricane Katrina. Religion is listed among the several cultural factors that influence both disaster risk reduction (Krüger, Bankoff, Cannon, Orłowski, & Schipper, 2015) as well as post-disaster recovery (Aldrich, 2012).¹ Most of these studies, however, rely on case studies of organizational (e.g., churches) actions; lacking are studies that investigate other features of regional religiosity that may play a part on recovery such as social capital, cultural homogeneity, philanthropic activity, etc.

The Complex Relationship Between Religion on Economic Change

Karl Marx argued that changes in human modes of production drove cultural change (Marx, 1992[1867]), while Max Weber argued the opposite: that ideas—particularly the peculiarities of Calvinist theology and its Protestant work ethic—wrought capitalism (Weber, 2002[1905]). Marx thought industrial capitalists could utilize religion to keep their workers in line, thereby maximizing productivity in factories (Ritzer & Stepnisky 2017, see Chapter 6). Weber, by contrast, believed that economic risk-taking among Protestants (but not among Catholics) drove a kind of proto-entrepreneurism (Ritzer & Stepnisky 2017, see Chapter 8). This tension between them has persisted. One side, in greater alignment with Marx, leans toward materialism, or the perspective that the types of work and resources available are what most powerfully drive change in both individual lives and in societies. The other side, in greater alignment with Weber, lean toward idealism, believing that the power of culture (including religion) is the greater driver in such transitions.

In contemporary focus, some evidence exists, as Weber predicted, that nations with greater Protestant cultural histories have more pro-market attitudes (Hayward & Kemmelmeier, 2011). Further, Galbraith and Galbraith (2007) argue that while “intrinsic religiosity” in some cases leads to economic growth, intrinsic religiosity is linked to entrepreneurial activity. However, Shapiro, Cuomo, Davis, and Walshok (2019) did not find the same association. Similarly, Balog, Baker, and Walker (2014) review of the literature on religiosity and entrepreneurship presents contradictory findings, centered on methodological shortcomings, divergences in definitions, lack of common theoretical frameworks, and more. Related to Marx's ideas about religion as a means of worker control, Barro and McCleary (2003) find that greater religious belief is associated with a nation's enhanced economic performance, but greater church attendance is not—because greater attendance results in more resources being given to the religious sector. Finally, a longitudinal, multi-nation study on inequality and religiosity by Solt, Habel, and Tobin Grant (2011) finds that, as inequality grows, so does religiosity:

The results of comparative analyses indicate that religiosity is much higher in the United States than in western Europe primarily because inequality is much greater there, making wealthy individuals more likely to adopt religion to justify their privilege and giving them more power to spread religious belief throughout their society.

(Solt et al., 2011, p. 463)

This argument could partly explain why religiosity was negatively linked with the other economic factors in our analysis; we address this further in our discussion.

Resilience to Recession

Recession represents an alternate form of disaster, felt most acutely as an economic rather than natural or social event, with wide-ranging financial impacts on both individuals and regions.

Factors Boosting Individual Resilience to Recession

After the Great Recession ended in 2009, the economy recovered at an unusually slow pace, in part because of high levels of inequality in the United States (Cynamon & Fazzari, 2015). Individual-level factors such as age, race, gender, industry, and education level had significant effects on differential rates of recovery in individual wages (Doran & Fingleton, 2015); for example, living in places of high population density is weakly correlated with lower resilience, but having a college degree is linked with higher resilience. Qualitative work has also elucidated how some of these factors make recovery more challenging, such as an article from Fenge, Worsowick, Hean, and Wilkinson (2012) on how difficult recession can be for the elderly, as re-budgeting and learning new money management techniques represent a particular challenge for this population. Harrison (2012) argues that an overemphasis on resilience itself can undervalue the difficulties of gendered dimensions of poverty, which can lead to blaming the victim (as with single mothers, for example). Similarly, some social scientists argue that the overemphasis on individual agency in economic recovery is misplaced, and that more emphasis needs to be put on regional and cultural characteristics that shape the social structures that guide recovery, in some cases creating path-dependent behaviors (Dagdeviren, Donoghue, & Promberger, 2016). Indeed, features like social networks, confidence in politics, and religiosity also have some positive impact on people's happiness levels after a recession (Reeskens & Vandecasteele, 2017). In two rural communities in Canada, greater social capital helped ward off mental health and substance abuse problems after a recession (Frank, Davis, & Elgar, 2014). However, beyond a sense of well-being or happiness, it remains unclear is whether religiosity helps facilitate recovery from recession in financial terms.

Factors Boosting Regional Resilience to Recession

The impact of regional characteristics on recovery from recession is an area of growing interest. Fingleton, Garretsen, and Martin (2012) found greater differences in how U.K. regions initially resisted employment shocks than in how they recovered from them. Deller, Conroy, and Watson (2017) found that regions in the United States with larger shares of female-owned businesses maintained more stable employment rates, as female-led enterprises were somewhat less likely to lay off workers than male-led firms. Han and Goetz (2019) examined spatial networks and

concluded that the centrality of an industry in a region makes a difference for the region's post-recession ability to regain employment rates. Martin (2012) reminds us that resilience is not a static feature of an economy, but a dynamic process. While it may be measured by some numeric coefficient value, that number reflects a set of evolving social interactions. Therefore, it is important that regional policymakers understand “the core competencies of each local area as they have evolved and emerged across many economic cycles” (Martin, Sunley, & Tyler, 2015, p.146). This includes more than just business competencies like technological innovations or industry clusters, but also social and cultural capitals—such as density of various types of relational and business networks, traits of regional populations on views toward work and science, and regional religiosity among them. In this paper, we test whether or not a regional degree of religiosity is associated with regional resilience to recession, in terms of a region's speed in returning to its pre-recession employment rate. We used statistical analysis to explore this process.

Methods

Data

The purpose of this research was to determine the psychosocial characteristics that are significantly associated with resilience to recession at the county level. Resilience data, the dependent variable in this study, was computed using formulas described in a prior publication (redacted for blind review). Resilience is measured as a logarithmic function of the quotient between the drop in employment rate during the Great Recession and the post-recessionary increase in employment rate, while adjusting for pre-recession trends in county-level employment. See Figure 1 for a visual illustration of resilience. Though mathematically taking standard deviation into account, the measure of resilience used in this study is given at the county level.

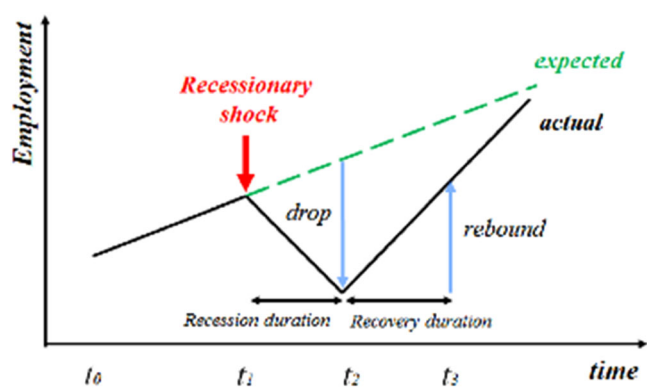


Figure 1. Resilience Measured By Return to Expected Levels of Employment. (Adapted from Han and Goetz [2015] with permission).

The covariates of interest in this study are latent, population-based psychosocial factors from combinations of questions in the Gosling-Potter Internet Project survey and the General Social Surveys (GSS). Both surveys have undergone several waves of administration. The authors were not involved in the conception or administration of either survey, but survey data were provided to the authors for the purpose of these analyses. The Gosling-Potter Internet Project was devised to compute measures for the so-called "Big Five" personality traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism. While organized into domains, the GSS ask varying combinations of societally relevant questions during each iteration of survey fielding. We found sufficient questions and data to support combining 11 latent factors: religiosity, work ethic, risk-taking, empathy, selflessness, gender equality, conflict awareness, hopefulness, collectivism, tolerance, and belief in science (see Appendix A). We show how religiosity compared with each of these other constructs in the appendix; however, our main focus in this paper is the association of religiosity with recovery from recession. Furthermore, Appendix B lists the individual questions, which were incorporated in the computation of psychosocial variables used in this study, and Appendix C offers descriptive statistics for each.

The exact items that General Social Survey respondents replied to in order to construct our independent variable, religiosity, are also in Appendix B. However, here they are in brief. Respondents were asked to give the frequency that they "ask for God's help in the midst of daily activities;" how frequently they "desire to be closer to God or in union with Him;" and how frequently they pray. They were asked to indicate their level of agreement with the statement that "life is meaningful only because God exists" and if they agree that "it is important to obey church teachings even if I don't understand them." They were also asked to indicate where they fall on a continuum of extremely religious to extremely non-religious. Lastly, they were asked to indicate their confidence level on a continuum of belief in God, doubt, or belief in no God. These indicators emerge from more voluntary and subjective self-identification of religiosity for respondents than simply religious service attendance or religious adherence, which was used, for example in Cutter, Burton, and Emrich (2010) study on resilience.

Analysis

After identifying survey questions to combine into individual factors, scales were standardized between questions and the mean value was taken from standardized scales to produce a single county-level value for each latent factor. Though derived from longitudinal surveys, latent factors are considered fixed, community-based psychosocial traits as no evidence exists to suggest notable variation over the fielding time periods for selected questions. Therefore, prior to combining into a latent factor, survey responses across years were merged to compute mean cross-year scores for each survey question. Furthermore, when calculating mean values for a county's latent factors, survey

questions without available data for the given county were omitted. For comparability between the sixteen psychosocial factors, feature scaling was applied, whereby the factor value for each county was expressed as a percent of the county with the maximum value. Breiman's random forest algorithm was then used to impute values for missing data points that maintained the bi-variate relationship between the covariate and the dependent variable. Ordinary least squares regression was then applied to the covariates and dependent variable. Using this methodology, the association between a dependent variable and a given covariate is statistically adjusted for the relationships between the dependent variable and all other covariates in the multivariable model. Given that each regression model included sixteen covariates, statistical values presented for one of the covariates has been adjusted for the effect of fifteen other psychosocial variables. Statistical analyses were done in R version 3.6.0 (R Foundation for Statistical Computing, Vienna, Austria) and maps were made using ArcGIS version 10.6 (ESRI: Redlands, CA) (Figure 2).

Results

This research uses regression analytical methods to compute the relationships between county-level resilience to recession and each of 16 psychosocial covariates (while adjusting for confounding effects from the other fifteen covariates). Results from this analysis show that resilience was significantly positively related to

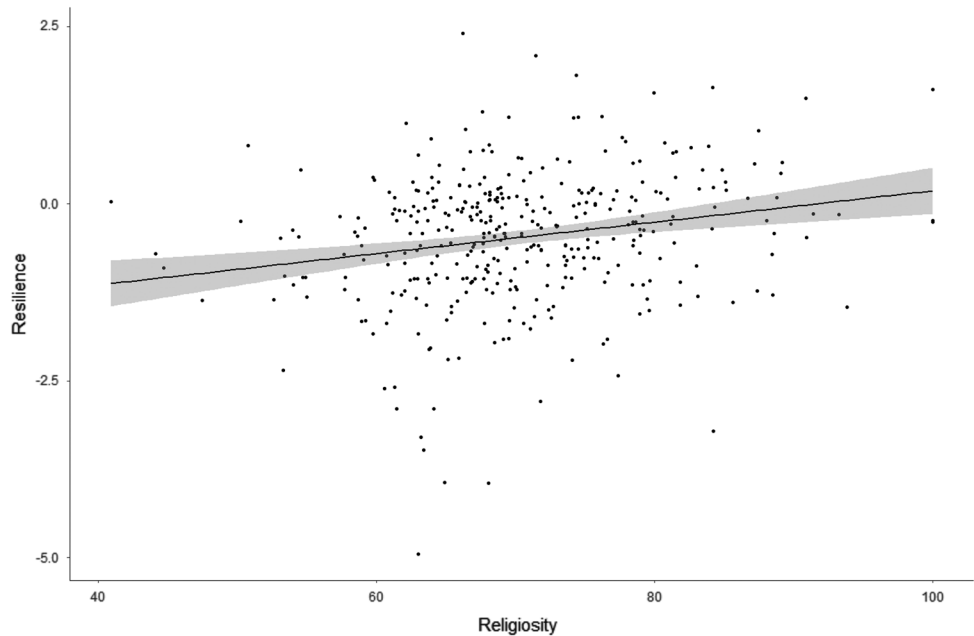


Figure 2. Relationship Between Religiosity and Regional Resilience to Recession at the County Level.

religiosity, work ethic, risk-taking, and empathy; and significantly negatively related to conflict awareness, hopefulness, agreeableness, collectivism, and tolerance. Resilience was not significantly associated with conscientiousness, neuroticism, selflessness, gender equity, extraversion, openness, and belief in science. The overall model was statistically significant and included 2,836 U.S. counties ($R^2 = 0.35$; $p < 0.0001$).

In this multivariate model, the effect size of religiosity was over double that of the covariate with the second-highest positive association. Specifically, each percentage increase in religiosity leads to an 0.035 unit increase of resilience. Furthermore, the absolute value of the t statistic ($t = 12.13$) was second highest among all covariates (range = 0.25–14.82), and standard error of the effect size for the covariate-adjusted relationship between religiosity and resilience was third lowest at 0.00013 (range = 0.01013–0.00012), indicating relatively little dispersion around the trendline. The bivariate trendline relating religiosity to resilience found that a unit increase in religiosity was associated with a 0.022 unit increase in resilience ($R^2 = 0.045$; $p < 0.001$). The higher effect size of the religiosity variable in the multivariate model suggests that other unaccounted psychosocial factors may obscure the impact of religiosity on economic resilience.

Geospatial visualizations suggest that this relationship may be driven by low levels of resilience and religiosity in urban areas of the West Coast and Northeast, as well as high levels of resilience and religiosity in comparatively rural areas of the Deep South, Appalachia, and West Texas (Figures 3 and 4).

Religiosity was negatively associated with employment rate and with individual income level, relative to most other variables. However, it was the most positively associated of our 16 psychosocial variables with resilience to recession—or how quickly the employment rate returned to pre-recession levels (see Appendix A).

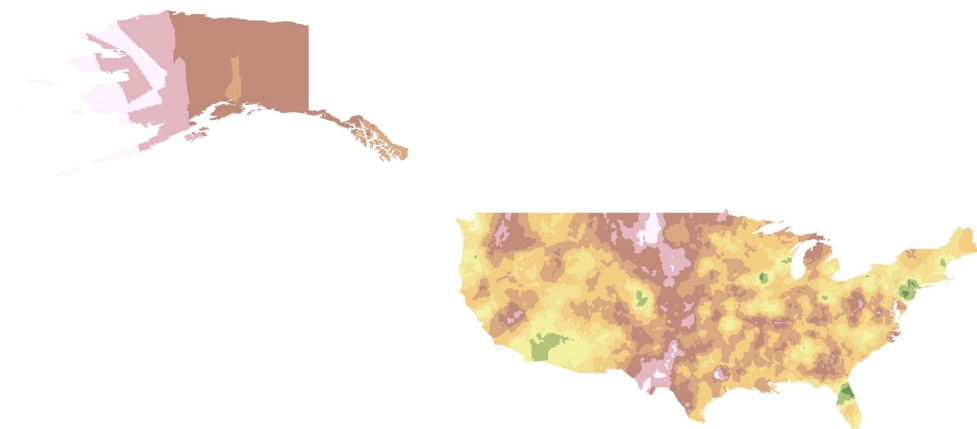


Figure 3. Geospatial Heatmap of National Dispersion of Religiosity. *Note:* Green (low religiosity) to red-white (high religiosity).

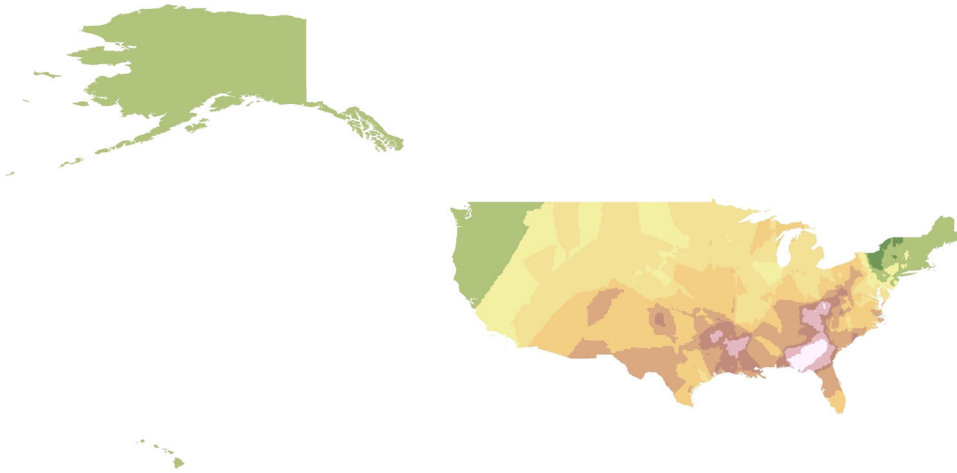


Figure 4. Geospatial Heatmap of National Dispersion of Resilience to Recession. *Note:* Green (low resilience) to red-white (high resilience).

Discussion

Individual and regional resilience are linked to many cultural and psychosocial features, though the explicit ties between regional religiosity and resilience to recession remain underexplored. Given that religiosity has been associated with greater individual and regional resilience to depression, trauma, and disaster, it is understandable that we observed a relationship between religiosity and recession recovery. The composite religiosity variable was a combination of questions about intensity of belief, views on how important it is to follow church teachings, and other General Social Survey questions about closeness to God. The only item indicating behavior was frequency of prayer. However, generally, our religiosity variable is centered on the affective and cognitive components of religiosity. There were not items related to the content of beliefs or teachings, frequency of attending worship services, various religious practices, nor types of denominational affiliation. Thus, the extent of our finding is that a greater intensity of belief among respondents is modestly associated with a faster return of employment levels after an economic downturn. This finding is exploratory and invites alternate angles of inquiry to see how the effect holds across religious traditions and categories; as well as the role of religious practices as an independent variable.

Religiosity does not correlate positively with all socioeconomic variables, and this is not supported by our study findings. In our data set, while positively associated with resilience of employment after a recession, religiosity was negatively associated with income and rates of employment before a recession. Doran and Fingleton (2015) suggest that levels of urbanization and pre-recession employment density could play a role. Han and Goetz (2015) also point to regional adjacency to critical industry sectors associated with the recession, such as key metropolitan financial centers in the Great Recession. This is to say that metropolitan financial centers and areas with greater urbanization are likely to: (i) have more skilled labor opportunities to begin

with and (ii) be more secular and metropolitan in outlook. Our geospatial analysis corroborates this assertion, as it reveals that the contrasting effects of religiosity on resilience, as opposed to its effect on income or rates of employment, may be driven by especially high levels of religiosity in the Deep South geographic sub-region of the United States, an area dominated by rural communities. Nevertheless, even if the finding is most applicable to rural communities, it remains particularly salient as rural communities already experience the greatest economic inequalities (Bailey, Jensen, & Ransom, 2014; Thiede & Monnat, 2016).

Considerable literature exists on the role religiosity plays in generating resilience in individuals and regions to overcome shocks—enough evidence to argue that regional religiosity should be considered as at least one of the variables that explains the social and cultural capital that help a region rebound after an economic downturn. The fact that religiosity should be included is the contribution of this article. However, bigger questions remain: *Why* and *how* might religiosity impact recession recovery? Likely, qualitative work is best suited to answer these “why” and “how” questions.

Policy Recommendations

While promoting religiosity typically resides outside the realm of policy workers (nor is this our suggestion), there may be important work that can be done with existing faith communities before and after a recession. Our hypothesis is that social capital rather than organizational action or psychological resources is the strongest factor behind the association we observed (Frank et al., 2014). While our religiosity measure focused on beliefs and intensity of self-identified religiosity, we suspect these are highly related to measures of connection to like-minded others. Therefore, we argue that especially in regions higher in religiosity—typically rural communities which tend to be more economically disadvantaged—drawing partnerships with faith communities to deploy career and mental health services will be of greater utility than similar approaches in more urban or metropolitan environments. As a greater share of the social institutional infrastructure in rural communities comes from religious organizations, they should be more likely targets for programmatic intervention than in environments that are less religious and rely on institutions more secular in nature (e.g., civic organizations, clubs, cultural organizations). Rather than determining whether faith communities are effective partners in a vacuum, policy leaders would do well to determine the context of the local community, as the proportion of the local citizenry who are religious may substantially determine the effectiveness of mobilizing faith communities.

Second, case study literature shows that organizational action can be helpful. For example, two case studies (Dahlberg et al., 2015; Rivera & Nickels, 2014) pointed to the role of churches and religious groups to aid in disaster preparedness and disaster recovery. Our first recommendation is to have an awareness of what economic development or career services currently exist among the religious organizations of a given region, as well as their scale and scope. An awareness of what exists “on the ground” locally may save significant amounts of time during sharp

downturns when interventions and resources may need to be deployed more rapidly. Whether using these organizations as the site of resource and intervention distribution, or simply as centers for awareness raising and communication of services—these social networks could be greatly prove advantageous in circulating information. In fact, these organizations have been called “resource brokers” in poor neighborhoods (Small, 2006). In addition, two of the most in-demand services in an economic downturn—food banks and childcare centers—are known to be often tied to faith communities in poorer areas (Enke, Briley, Curtis, Greninger, & Staskel, 2007; Small, Jacobs, & Massengill, 2008; Small, & Stark, 2005).

Conclusion

Limitations

There is the possibility that other factors contribute to the association we found that we were not able to add to our model due to data limitations. Future research might gather data with additional control variables. Our analytical methodology did not account for counties with low sample sizes. While a weighting technique could be applied to partly account for discrepancies in sample sizes by county, we felt that the application of this technique would have detracted from the interpretability of analytical findings. Also, when producing latent constructs from survey data, imputation was not leveraged for counties with missing data for individual survey questions. In this scenario, a county's score for the latent construct would be ascertained only from questions where data were available. This choice may have introduced some unaccounted variability in constructed covariates.

Implications for Future Research

We propose a few lines of inquiry for future researchers.

Psychological Resources. First, at a micro level, religiosity is associated with helping individuals fend off depression and grow resistance to life stressors. Certain types of religiosity may help individuals gain what has been more recently popularized as “grit” (Duckworth, 2016), or the mental resources to persevere in the face of challenges. Perseverance in job seeking over a common response of despair to unemployment (Ochsen & Welsch, 2011) could be partially responsible for the speed of resilience (defined in this study at the speed of return to pre-recession employment levels).

Social Capital. Second, the speed of economic recovery could be impacted by the increased social capital that communities with robust social networks, such as faith communities, may wield. Social capital has been shown to have economic

implications due to both the networks that can potentially help job seekers find work (e.g., Granovetter, 1973; Mouw, 2003) and the increased trust (essential for making market transactions) that helps grease the wheels of economic and financial institutions (e.g., Francoise & Zabochnik, 2005; Wilson, 2000).

Organizational Action. Third, is it possible that economic recovery is less tied to individual religiosity and more related to the religious organizations that offer social services and career- or employment-related services (e.g., Barnes, 2004; Fox, 2003; Reese & Shields, 2000). Future research is needed to probe these, and other, possible reasons for why religiosity may speed a region's recovery of employment rates after a recession; and especially in rural and poorer communities.

Summary

Compared against fifteen other psychosocial variables we employed, religiosity scored the highest in association with resilience (defined in this study as the speed at which the number of jobs returned to pre-recession levels [Table A3]). A positive link with religiosity is unique to resilience among our dependent variables, as religiosity was negatively associated with income level and employment rate (outside of a recession). We take this to mean that while religiosity appears to possibly be associated with slightly worse-off economic conditions overall, its impact has also shown association with a region's ability to bounce back quickly to restore job numbers to pre-recession rates. This may largely be linked to the portions of the country with greater religiosity also being the same regions that are more rural and often facing greater economic challenges than other regions. Policy implications center around being aware of the religiosity context of a region when designing interventions around recession. If the region is rural and poorer, and has a relatively higher religiosity among citizenry per capita, then these are the regions where interventions will be more effective when partnering with regional faith communities. This partnership can simply be to mobilize awareness of resources, or can involve direct interventions with the faith organizations that often act as "resource brokers" in these regions, particularly in the areas of childcare centers and food banks.

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Notes

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1. Notably, however, Mitchell (2003) made an important cultural distinction among Christian clergy: use of prayer as a form of *protection* from the effects of disaster was common, but few—only the most fundamentalist conservative clergy—attempted to use prayer as *prevention* from disasters in the first place.

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Appendix A: Multiple Linear Regression Models for Resilience, Per Capita Income, and Employment Rate

Table A1. Multiple Linear Regression Model for Resilience

n = 2836 counties R ² = 0.35 p < 0.0001				
Covariate	Estimate	Std. Error	t	p
<i>INTERCEPT</i>	4.989317	1.733692	2.878	0.4482
Religiosity [†]	0.034830	0.001307	12.126	<0.0001
Work Ethic [†]	0.014286	0.010000	5.650	<0.0001
Risk-Taking [†]	0.011342	0.002929	8.679	<0.0001
Conscientiousness [†]	0.002458	0.009910	0.248	0.0910
Empathy [†]	0.002410	0.001267	1.902	<0.0001
Neuroticism*	0.002194	0.007701	0.285	0.8041
Selflessness [†]	0.001295	0.002527	0.442	0.6584
Gender Equality [†]	-0.003694	0.004019	-0.919	0.3581
Extraversion*	-0.004804	0.007560	-0.635	0.7757
Conflict Awareness [†]	-0.013007	0.001201	-10.830	<0.0001
Hopefulness [†]	-0.014847	0.002872	-14.820	<0.0001
Agreeableness*	-0.017121	0.010127	-1.691	0.0040
Openness*	-0.018961	0.008850	-1.664	0.5252
Collectivism*	-0.018961	0.002718	-6.976	<0.0001
Tolerance [†]	-0.019882	0.002528	-7.869	<0.0001
Belief In Science [†]	-0.031146	0.002886	-10.791	0.0963

*Source: Gosling–Potter Internet Project, University of Texas.

[†]Source: General Social Surveys, University of Chicago.

Note: A color gradient has been applied for regression beta estimates, indicating relatively high estimates within green-shaded cells, average estimates within yellow-shaded cells, and low estimates within red-shaded cells. *p* values in brown text are not statistically significant.

Table A2. Multiple Linear Regression Model for Individual Income Per Capita in U.S. Dollars

<div> n = 3093 counties R² = 0.47 p < 0.0001 </div>				
Covariate	Estimate	Std. Error	t	p
INTERCEPT	\$31,179.77	8281.07	3.77	<0.0001
Openness*	\$267.22	42.25	6.32	<0.0001
Belief In Science†	\$253.80	13.83	18.35	<0.0001
Extraversion*	\$219.83	36.19	6.07	<0.0001
Gender Equality†	\$112.29	18.54	6.06	<0.0001
Hopefulness†	\$48.07	4.85	9.91	<0.0001
Conflict Awareness†	\$34.42	4.82	7.15	<0.0001
Work Ethic†	\$8.97	14.39	0.62	0.5332
Selflessness†	\$3.88	15.23	0.26	0.7987
Empathy†	\$0.63	6.39	0.10	0.9212
Risk-Taking†	(\$23.93)	7.28	-3.29	0.0010
Tolerance†	(\$28.09)	14.94	-1.88	0.0602
Collectivism†	(\$37.84)	14.44	-2.62	0.0088
Conscientiousness*	(\$124.78)	47.55	-2.62	<0.0001
Agreeableness*	(\$160.73)	48.57	-3.31	<0.0001
Religiosity†	(\$279.75)	13.32	-21.00	<0.0001
Neuroticism*	(\$342.32)	35.95	-9.52	0.0087

*Source: Gosling–Potter Internet Project, University of Texas.

†Source: General Social Surveys, University of Chicago.

Note: A color gradient has been applied for regression beta estimates, indicating relatively high estimates within green-shaded cells, average estimates within yellow-shaded cells, and low estimates within red-shaded cells. *p* values in brown text are not statistically significant.

Table A3. Multiple Linear Regression Model for Employment Rate, Percent Fully or Partly Employed

<div> n = 3093 counties R² = 0.30 p < 0.0001 </div>				
Covariate	Estimate	Std. Error	t	p
INTERCEPT	101.926%	3.215	31.70	<0.0001
Gender Equality [†]	0.074%	0.007	10.08	<0.0001
Extraversion*	0.071%	0.013	5.38	<0.0001
Belief In Science [†]	0.034%	0.005	6.26	<0.0001
Hopefulness [†]	0.022%	0.003	6.41	<0.0001
Conflict Awareness [†]	0.020%	0.003	7.39	<0.0001
Tolerance [†]	0.008%	0.006	1.39	0.1638
Conscientiousness*	0.007%	0.017	0.42	0.6750
Risk-Taking [†]	0.002%	0.003	0.71	0.4761
Selflessness [†]	-0.001%	0.007	-0.12	0.9062
Work Ethic [†]	-0.007%	0.006	-1.23	0.2188
Empathy [†]	-0.036%	0.004	9.33	<0.0001
Neuroticism*	-0.052%	0.013	-3.89	0.0001
Collectivism [†]	-0.058%	0.005	-10.65	<0.0001
Religiosity [†]	-0.077%	0.005	-15.13	<0.0001
Openness*	-0.078%	0.015	-5.10	<0.0001
Agreeableness*	-0.091%	0.018	-5.12	<0.0001

*Source: Gosling–Potter Internet Project, University of Texas.

[†]Source: General Social Surveys, University of Chicago.

Note: A color gradient has been applied for regression beta estimates, indicating relatively high estimates within green-shaded cells, average estimates within yellow-shaded cells, and low estimates within red-shaded cells. *p* values in brown text are not statistically significant.

Appendix B: Questions in Each Variable

The “Big 5” Personality Trait Items

Scored using Likert style 1–5 ranges. See the Gosling-Potter Internet Project for more specifics: <https://www.personality-project.org/>.

Agreeableness <ul style="list-style-type: none">• I am helpful and unselfish with others.• I tend to find fault with others.• I tend to start quarrels with others.• I have a forgiving nature.• I am generally trusting.• I can be cold and isolated.• I am considerate and kind to almost everyone.• I am sometimes rude to others.• I like to cooperate with others. Conscientiousness <ul style="list-style-type: none">• I can be somewhat careless.• I carry out my job thoroughly.• I am a reliable worker.• I tend to be disorganized.• I tend to be lazy.• I persevere until the task is finished.• I do things efficiently.• I make plans and follow through with them.• I am easily distracted. Extraversion <ul style="list-style-type: none">• I see myself as someone who is reserved.• I am talkative.• I am full of energy.• I am passionate and spirited.	Extraversion <ul style="list-style-type: none">• I tend to be quiet.• I have an assertive personality.• I am sometimes shy and inhibited.• I am outgoing and sociable. Neuroticism <ul style="list-style-type: none">• I am relaxed and can handle stress well.• I am depressed and blue.• I can be tense.• I worry a lot.• I am emotionally stable and not easily upset.• I can be moody.• I remain calm in tense situations.• I get nervous easily. Openness <ul style="list-style-type: none">• I am curious about many things.• I always come up with new ideas.• I am a creative and a deep thinker.• I have an active imagination.• I am inventive.• I value artistic experiences.• I prefer work that is routine.• I like to reflect and play with ideas.• I have few artistic interests.• I am advanced in art, music, or literature.
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Items From the General Social Survey (GSS)

Scoring styles vary across items. See GSS codebook for more specific: http://gss.norc.umd.edu/documents/codebook/gss_codebook.pdf

Belief in Science <ul style="list-style-type: none">• Even if it brings no immediate benefits, scientific research that advances the frontiers of knowledge is necessary and should be supported by the federal government.• Science and technology are making our lives, healthier, easier, and more comfortable.• We believe too often in science, and not enough in feelings and faith.	Hopefulness <ul style="list-style-type: none">• I can think of many ways to reach my current goals.• If I should find myself in a jam, I could think of many ways to get out of it.• There are lots of ways around any problem that I am facing now.• I hardly ever expect things to go my way.• I'm always optimistic about my future.• If something can go wrong for me, it will.
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(Continued)

Collectivism

- Adult children have a duty to look after their elderly parents.
- People who are better off should help friends who are less well off.
- Those in need have to learn to take care of themselves and not depend on others.
- When there are children in the family, parents should stay together even if they don't get along.

Conflict Awareness

In all countries, there are differences or conflicts between different social groups. In your opinion, in America, how much conflict is there between:

- poor people and rich people?
- people at the top of society and people at the bottom?
- young people and older people?
- management and workers?
- the working class and middle class?

Empathy

- I often have tender, concerned feelings for people less fortunate than me.
- Other people's misfortunes do not usually disturb me a great deal.
- When I see someone being taken advantage of, I feel kind of protective towards them.
- When I see someone being treated unfairly, I sometimes don't feel very much pity for them.

Gender Equity

Do you agree or disagree:

- both the husband and the wife should contribute to the household income.
- It is not good if the man stays at home and cares for the children and the woman goes out to work.
- It is more important for a wife to help her husband's career than to have one herself.
- It is much better for everyone involved if the man is the achiever outside the home, and the woman takes care of the home and family.
- How important is the women's rights issue to you—would you say it is one of the most important, important, not very important, or not important at all?
- All in all, family life suffers when the woman has a full-time job.

Religiosity

- I ask for God's help in the midst of daily activities.
- I desire to be closer to God or in union with Him.
- To me, life is meaningful only because God exists.
- How religious would you describe yourself as...
- About how often do you pray?
- It's important to obey church teaching even if I don't understand them.
- Please look at this card and tell me which statement comes closest to expressing what you believe about God.

Risk Taking

- In order to avoid unemployment I would be willing to accept a job requires new skills.
- In order to get a job, I would be willing to move to a different country.

Selflessness

- I am usually willing to sacrifice my own wishes to let the one I love achieve his/hers.
- I cannot be happy unless I place the one I love's happiness before my own.
- I would endure all things for the sake of the one I love.
- I would rather suffer myself than let the one I love suffer.
- Personally assisting people in trouble is very important to me.

Tolerance

- All religious groups in America should have equal rights.
- I accept others even when they do things I think are wrong.
- Would you accept a person from a different religion or with a very different religious view from yours, being a candidate of the political party you prefer?

Work Importance

- Work is a person's most important activity.
- A job is just a way of earning money-no more.
- Which of the following statements best describe your feelings about the job?
- Would you please look at this card and tell me which one thing on this list you would most prefer in a job? *"Work importance and gives a feeling of accomplishment."

Appendix C: Descriptive Statistics

	<i>N</i>	Minimum	Maximum	Mean	Std. Deviation
Resilience	2,836	−5.22	9.68	0.00	1.00
Agreeableness	3,021	65.77	100.00	85.23	2.23
Conscientiousness	3,021	59.26	100.00	83.01	2.22
Extraversion	3,021	67.67	100.00	87.01	2.32
Neuroticism	3,021	50.76	100.00	78.39	2.63
Openness	3,021	67.82	100.00	78.78	1.99
Belief In Science	436	33.33	100.00	67.87	8.72
Collectivism	423	25.00	100.00	67.66	8.88
Conflict Awareness	189	35.00	100.00	61.92	9.07
Empathy	286	25.00	100.00	79.83	7.91
Gender Equality	445	40.00	100.00	68.73	6.73
Hopefulness	228	62.27	100.00	84.34	6.94
Religiosity	449	40.91	100.00	70.23	9.30
Risk Taking	319	20.00	100.00	73.13	16.32
Selflessness	409	25.00	100.00	76.92	8.77
Tolerance	424	26.25	100.00	69.55	9.83
Work Ethic	427	33.33	100.00	70.02	8.43