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ORIGINAL PAPER

Does economic freedom lighten the blow? Evidence from the great recession in the United States

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Abstract

The Great Recession led to a large decline in economic activity throughout the entire United States with significant variation in its severity across regions. Our paper examines the role of economic freedom in explaining these differences at the metropolitan statistical area (MSA) level. We use the Stansel (2013; 2019) MSA-level economic freedom index to analyze the relationship between institutional quality and economic outcomes throughout the crisis period. Using a panel dataset of 382 MSAs from 2002 to 2012, we find that economic freedom is associated with enhanced economic outcomes – lower unemployment rates, more employment per 100 persons, and higher income per capita. This holds true even when examining a cross-section of MSAs using data from the crisis period alone. We supplement these findings with a matching analysis where we find that MSAs that experienced meaningful increases in economic freedom in the five-year period *before* the Great Recession (2002–2007) had quicker recoveries – in terms of unemployment rates and income – than their matched counterfactuals from 2007 to 2012. Overall, our findings suggest that economic freedom *did* "lighten the blow" from the Great Recession.

Keywords Economic freedom · Crisis · Great recession · Regional development

JEL Code H12 · R11 · O10

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1 Introduction

The Great Recession was the worst economic crisis to hit the United States since the Great Depression. When compared to the recession of the early 1980s, the peak-to-trough decline in real GDP was 2% points lower with even more substantial declines when looking at payroll employment (Blinder 2015). The Great Recession was also prolonged. Unemployment rates remained above pre-recession levels through 2016 (Cunningham 2018) and real GDP did not return to pre-crisis levels until 2011 (Blinder 2015). This lackluster performance has led to a large literature examining the federal and monetary policies (or lack thereof) that could explain such an anemic recovery (Taylor 2014; Verick and Islam 2010; Wynne 2011).[1]

While the entire country felt the negative fallout from the Great Recession, the impact and subsequent recovery was not homogenous across areas. For example, Bennett et al. (2018) find that rural areas experienced a milder recession with a slower recovery than urban areas. In a similar vein, when comparing the length of recent recessions across the 50 largest metropolitan statistical areas (MSAs), Arias et al. (2016) find that while the Great Recession had a negative impact across all cities, some MSAs experienced a relatively brief downturn. The peak-to-trough period was less than a year for cities such as Austin and San Antonio, while the other cities suffered declines for much longer (e.g., Richmond and Memphis). What explains these different recovery rates? Why did some areas experience such a sharp recession accompanied by an anemic, slow-moving recovery? These are the questions we explore in this paper.

The extant literature offers several explanations for the heterogenous impact and recovery of the Great Recession within the United States. Arias et al. (2016) find both education and housing supply elasticity to be important determinants of crisis severity across MSAs. Similarly, Piskorski and Seru (2021) highlight financial frictions associated with the housing market as a major factor in predicting a region's recovery rate. Walden (2014), using state-level data, finds that certain industry characteristics (e.g., whether the state had a high concentration of financial services) tend to quicken recovery, while government intervention via income transfers and corporate taxes have the opposite effect. We expand upon this existing research by focusing on the role of local economic policies in determining both the initial impact and the rate of recovery of the Great Recession across 382 U.S. metropolitan statistical areas (MSAs). More specifically, we explore how economic freedom, defined broadly as an institutional or policy environment associated with voluntary exchange (Gwartney et al. 2019), influenced both the severity of the Great Recession and the speed of the recovery. In doing so we control for important factors like industrial structure, concentration, and housing costs. We additionally focus on *within* MSA effects such that important (largely) time-invariant factors like housing elasticity are differenced out.

A positive association between a country's level of economic freedom and a number of (good) economic outcomes is well-established in the literature including growth (e.g., Heckelman 2000; De Haan 2003; Dawson 2003; Grier and Grier

[1] Cynamon and Fazzari (2016), for example, argue that higher income inequality helps explain this slow recovery.

2021), investment (Bengoa and Sanchez-Robles 2003; Kapuria-Foreman 2007), and entrepreneurship (Nyström 2008).[2] Similar evidence can be found at the U.S. state-level (Sobel 2008; Compton et al. 2011; Wiseman and Young 2013; Hall et al. 2019). There is also a growing body of literature connecting MSA-level freedom to economic outcomes such as personal income (Bologna et al. 2016), entrepreneurship (Bologna 2015; Bennett 2019, 2021), and patent activity (Wagner and Bologna Pavlik 2020). However, much of this literature is focused on uncovering general associations between economic freedom and economic outcomes outside of crisis years. It is unclear that economic freedom is beneficial throughout times of crisis. Economic freedom implies a lack of government involvement, where the latter may be necessary as a safety net and to facilitate recovery. Thus, the question remains: do the benefits of economic freedom outweigh these potential costs even in a crisis?

There is a blossoming literature highlighting the potential benefits of economic freedom on crisis recovery. In the context of global pandemics, Geloso and Bologna Pavlik (2021) and Candela and Geloso (2021) show that economic freedom can lessen the associated negative economic consequences. Similarly, Bjørnskov (2016) examines 212 major crises across 175 countries and finds a negative association between economic freedom and crisis severity. The intuition behind these studies is that economic freedom offers the flexibility necessary for entrepreneurs to make adjustments that support recovery. Piskorski and Seru (2021) study emphasizes the role of frictions in explaining crisis severity. A more economically free society tends to remove many of the barriers that inhibit growth and recovery.

We are the first to test whether economic freedom has an impact on crisis severity and recovery at the local level. We expand upon the analysis of Bjørnskov (2016) in that we are studying the within nation impact of a single (nationally) homogenous crisis. We also expand upon Walden (2014) by utilizing a more comprehensive measure of economic freedom as opposed to specific governmental policies (e.g., corporate taxes). Further, given the heterogeneity of the crisis even within states, our study focuses on the local (MSA) level as opposed to states.

Our analysis can be separated into two parts. First, we utilize an MSA-level economic freedom index developed by Stansel (2013; 2019) and relate this index to the MSA's unemployment rate, employment per 100 people, and per capita income levels throughout the crisis period. Our focus here is whether economic freedom tends to lessen the negative impact of the recession. We also examine the relationship between economic freedom and *total* income per capita, as opposed to just *productive* income (i.e., income net of transfer payments) as is typically done in the literature (e.g., Higgins et al. 2006). A potential drawback of economic freedom in a crisis is the absence of a social safety net. It could be the case that while productive income is higher, total income is lower due to a lack of governmental transfers.

The second part of our analysis utilizes matching methods (Propensity Score and Mahalanobis Matching) where we relate *changes* in economic freedom (i.e., the treatment) to subsequent *changes* in our economic outcome measures from 2007 to

[2] See Hall and Lawson (2014) for a comprehensive for of the literature involving the Economic Freedom of the World Index. As noted in their review, inequality is one area in which there is mixed evidence regarding the benefits of economic freedom.

2012. We define a treatment as one where an MSA experiences a significant and sustained increase in economic freedom *prior* to the crisis.[3] We then match these treated MSAs to "similar" untreated areas and calculate an Average Treatment Effect on the Treated (ATET) as the average difference in the *change* of our outcome variable for our treated MSAs relative to their matched counterfactuals. Examining the effect of economic freedom on changes in our outcome variables has the intuitive benefit of focusing on MSA recovery from 2007 to 2012. It also has the practical benefit of differencing out time-invariant characteristics (such as housing elasticity), analogous to the fixed effect specifications of regression models (An and Winship 2017; Grier and Grier 2021).

This matching analysis is also an important robustness check of our regression estimates. Recent literature has shown that two-way fixed effect regression estimators, such as the one we use in our panel analysis, can result in a biased treatment estimate, particularly when the assumption of linear additive effects is violated (e.g., Imai and Kim 2021). Matching has been proposed as a useful alternative as it does not rely on functional form assumptions and focuses on the treatment's impact using a simple difference in averages as opposed to using the less transparent and potentially non-convex regression weights (e.g., Imai and Kim 2019; Grier and Grier 2021).[4] This also has the benefit of matching upon both pre-treatment outcomes and initial economic freedom levels to ensure that we are only comparing "treated" MSAs (i.e., MSAs that experienced changes in economic freedom) with appropriately similar non-treated units. In other words, we are comparing MSAs that had similar economic environments *prior* to both the treatment and crisis helping to address the concern of selection bias. We then see how changes in this environment impact several economic outcomes that relate to economic recovery.

The MSA-level economic freedom index is available on a 5-year basis according to the available *Census of Governments* years. Thus, we first relate economic freedom to income using panel data in 5-year increments (2002, 2007, and 2012). In doing so, we include both period and MSA-level fixed effects. We then focus on cross-sectional results using the 2007 economic freedom level and average outcomes from the crisis period alone.[5] Our primary goal in this first part of the analysis is to test whether more economically free areas experience better economic outcomes, even during a crisis. A positive association implies a lower recovery burden – economic freedom could be viewed as a preventative measure to avoid major economic collapses.

We then address the question of whether economically free areas grow faster following an economic downturn using a matching analysis. We compare the recovery of "treated" MSAs with similar "untreated" MSAs in the post-crisis period (2007–2012). To define a treatment, we focus on large and sustained jumps in economic

[3] We also explored sustained decreases in economic freedom. However, decreases are uncommon leaving us with only eight potential treatments.

[4] This focus on simple (i.e., unweighted) averages is important given the likely presence of treatment heterogeneity that poses serious problems in two-way-fixed-effect regression models (de Chaisemartin and D'Haultfoeuille 2020; Goodman-Bacon 2021).

[5] For our cross-sectional results we focus on both the 2006–2008 and 2007–2009 periods separately. Because the Great Recession was a multi-year event, we want to capture lowest point for our MSAs on average.

freedom from 2002 to 2007. We then construct for each treated MSA a plausible counterfactual against which to compare crisis recovery. We choose counterfactuals based on covariates that plausibly determine the probability of treatment and/or are otherwise correlated with crisis recovery. In other words, these counterfactuals are MSAs that were similarly likely to have received the treatment but did not.

Combining the results of the first part of our analysis and our matching estimates, we uncover an intuitive narrative. Economic freedom tends to be positively associated with key outcomes, even during times of crisis. A standard deviation increase in economic freedom (0.76) decreases unemployment by nearly 1% point, increases employment by 1.36 per 100 persons, and increases income by (at least) 3%. These are meaningful changes in economic outcomes associated with only modest changes in economic freedom – equivalent to moving from Buffalo, New York to Grand Rapids, Michigan, for example. Economic freedom also accelerated the recovery of treated MSAs in the aftermath of the recession. Treated MSAs (those that experienced increases in economic freedom) experienced faster income and employment growth and slower growth in the unemployment rate throughout the recovery period. Thus, not only can economic freedom dampen the negative effects of an economic shock, but it can help communities recover quicker.

The remainder of our paper is as follows: Sect. 2 discusses the literature on institutions and crisis recovery, Sect. 3 summarizes empirical methodology, Sect. 4 describes our data, Sect. 5 discusses our results, and we conclude with Sect. 6.

2 Institutions and Crisis Recovery

Understanding community resiliency and crisis recovery is an important area of research. Recent literature spurred by the COVID-19 pandemic has highlighted the role of institutions in creating environments that facilitate recovery and create growth. Geloso and Bologna Pavlik (2021), for example, study the 1918 flu pandemic and show that the induced economic crisis was less severe in countries with higher levels of economic freedom. Similarly, using data on 20 OECD countries, Candela and Geloso (2021) show that economic freedom lessens contractions and accelerates recoveries associated with the major influenza pandemics of the 20th century. Economic freedom has also been shown to be important to crises recovery more generally. Bjørnskov (2016), for example, uses data covering 212 crises across 175 countries and finds that economic freedom tends to reduce both the peak-to-trough ratio (i.e., make the crisis less severe) and the recovery time. Thus, economic freedom seems to be associated with quicker economic recoveries and smaller negative shocks in response to crises in general.[6]

[6] This idea could be contrasted to Crain (2003) where the author argues that there is a tradeoff between volatility and long run growth. That is, volatile states with more severe economic swings also tend to experience stronger growth in the long term. Given that economic freedom has been shown to positively correlate with long run growth (e.g., Heckelman 2000; De Haan 2003; Dawson 2003; Grier and Grier 2021), the argument that economic freedom can also boost crisis recovery suggests that economic freedom could be a way to temper the Crain (2003) tradeoff. However, it is important to note that the arguments presented in this paper, and in the cited research, focus on how economic freedom affects crisis

Our paper contributes to these studies concerning economic freedom and crisis recovery by focusing on small locales within a single nation. More specifically, we focus on the Great Recession. While the effect of the crisis varies across MSAs, the crisis itself is much more homogenous when making intra- versus inter-national comparisons. This is important because we can understand how economic freedom influences crisis recovery when the major characteristics of the crisis in question are effectively held constant.

Why does economic freedom improve resiliency in response to economic crises? One potential explanation relates to flexibility. Economic freedom gives entrepreneurs the ability to make the necessary adjustments to facilitate recovery. In the context of recovery associated with Hurricane Katrina, Boetkke et al. (2007) argue that overregulation inhibited entrepreneurs from reopening. Similarly, Smith and Sutter (2013) argue that the lifting of building regulations and zoning laws accelerated the recovery of Joplin, Missouri following the 2011 tornado.

A related explanation involves entrepreneurial alertness. Entrepreneurs in areas with high levels of economic freedom have an incentive to be more innovative (Kreft and Sobel 2005; Boudreaux et al. 2019), for example, show a positive association between entrepreneurial alertness and a country's level of economic freedom. Regardless of the initial impact of the crisis, areas filled with ingenious and opportunistic individuals are likely to experience a swift recovery.

These arguments, however, run counter to the idea that governmental action is necessary to coordinate action that facilitates recovery. In the context of Katrina, for example, Burby (2006) argues that some form of government planning and/or intervention is crucial to recovery. More recently, in response to the COVID-19 pandemic, there is a renewed interest in the debate over the appropriate governmental response to crises. While some highlight the effectiveness of measures such as mask mandates or stay-at-home orders in reducing the spread of COVID (and potentially quickening recovery as a result) (e.g., Courtemanche et al. 2020), others call into question the necessity of such interventions and argue further that they could be harmful to social welfare relative to the alternatives (Boettke and Powell 2021). The latter argument emphasizes the importance of bottom-up solutions, local knowledge, and entrepreneurial nimbleness in navigating the COVID-19 pandemic and facilitating recovery.

Even if governmental action *can* improve upon crisis situations, there are several incentive incompatibilities that must be considered. Political motivations (e.g., reelection incentives) strongly influence political behavior and have been shown to impact federal spending allocation (Young and Sobel 2013), federal grants (Kriner and Reeves 2015; Stratmann and Wojnilower 2015), transfers (Tackett and Bologna Pavlik 2021), disaster declarations (Leeson and Sobel 2008), and corruption convictions (Bologna Pavlik 2017). In discussing constitutionally mandated power in response to an emergency, Bjørnskov and Voigt (2022) find that a (relative) boost in executive power during an emergency results in a greater number of disaster related

recovery. It does not focus on how economic freedom influences the frequency of such crises. This is left as an area of future research.

deaths. Their explanation behind this finding is that these natural disasters are being used to expand their power rather than save lives.[7]

More recently in the context of the COVID-19 pandemic, there is evidence that emergency orders were implemented based on underlying political and institutional factors as opposed to pure need. For example, Bjørnskov and Voigt (2021) find that the ability to gain discretionary power is a key determinant of whether a country declared a state of emergency. Similarly, within the U.S., McCannon and Hall (2021) find that states with Democratic governors and less economic freedom tended to implement stay-at-home orders quicker, even after controlling for important factors such as the date of the first COVID-19 related death in the state. Thus, though governmental involvement can improve economic conditions, there are significant political barriers that can inhibit welfare enhancing policy. For this reason, and because of the importance of local knowledge, Grube and Storr (2014) emphasize self-governance in determining community resiliency and explore how pre-existing self-governance systems aided recovery post-Katrina in two communities in New Orleans. Top-down (i.e., government) solutions are often devoid of local knowledge and are non-customizable. Bottom-up solutions may be better able to handle the complexity of the situation.

We directly consider the potential benefits of governmental intervention in response to the Great Recession. We focus not only on *productive* or *net* (income less transfers) income, but total (earned plus transfers) income. While the COVID-19 pandemic had significant health related externality concerns surrounding mask-wearing and individual behavior, the Great Recession was different. The biggest concern was economic stability, making transfers and government spending the most important focus of governmental intervention. Economically free areas, by definition, have a more limited government and tend to rely on individual decision-making efforts. Economic freedom yields more flexibility for entrepreneurial recovery efforts. Whether these benefits of economic freedom outweigh the cost of losing the governmental safety net throughout a crisis is an open question.

3 Empirical methodology

We are interested in understanding how economic freedom influences crisis severity and recovery. Identifying a causal effect of economic freedom (on crisis recovery) is challenging for (at least) two reasons. First, economically free areas are not selected at random. The determinants of economic freedom across metropolitan areas likely also affect economic outcomes (omitted variable/selection bias). Second, simultaneity could also be a concern if faster growing areas experience higher levels of freedom. Our empirical strategy aims to address these issues.

First, we estimate a panel model with both period- and MSA-fixed effects. This allows us to focus on within-MSA differences and eliminate many of the time-

[7] In a similar vein, Bjørnskov and Rode (2019) show that policy responses to crises depend on the economic ideology of the government in power. They find that expansions in government size and scope (regulatory policy) are more likely to occur in left-wing governments.

invariant factors that could bias our results. We also include a wide range of controls described in detail below. Second, we narrow in on the Great Recession years and conduct a cross-sectional analysis to get an estimate of the correlation between economic freedom and economic outcomes throughout periods of economic strife. Third, we employ a matching analysis that addresses both selection and simultaneity concerns, in addition to recent concerns with two-way fixed effect regression analyses (e.g., Imai and Kim 2019; 2021; Gibbons et al. 2019). This latter analysis also helps us focus more on recovery.

3.1 Panel regression

We start with a balanced panel regression of three time periods: 2002, 2007, and 2012. We estimate the following model:

$$Y_{i,t} = \beta_0 + \beta_1 MEFI_{i,t} + \beta_2 X_{i,t} + V_{st} + V_i + V_t + \varepsilon_{i,t} \quad (1)$$

where Y is our outcome variable (unemployment rate, employment per 100 people, or per capita income); *MEFI* is the MSA-level economic freedom measure; X is a set of relevant controls outlined below in Sect. 4; V_{st} is a state-specific linear time trend; V_i is an MSA-level fixed effect; and V_t is a period specific fixed effect. These latter three variables are only relevant for the panel results. Standard errors are clustered at the metropolitan area level. These specifications provide us with 1,146 observations (382 MSAs over three 5-year periods). Importantly, this panel includes both pre- and post-crisis years.

These panel regressions give us an estimate of the relationship between economic freedom and important economic outcomes using the standard workhorse regression model: two-way fixed effects (TWFE). These regressions include unit (MSA) fixed effects in an attempt control for time-invariant unobservable characteristics. However, serious concerns have been raised regarding TWFE models. First, they require strong functional form assumptions surrounding these unobservable characteristics (e.g., linearly additive) (Imai and Kim 2019). Second, regressions can extrapolate beyond the support of the data further demanding functional form assumptions. Relatedly, TWFE models can yield negative weights in the presence of treatment heterogeneity resulting in an estimated treatment that is potentially of the incorrect sign (de Chaisemartin and D'Haultfoeuille 2020). In addition to these TWFE concerns, it is also not clear that this association holds throughout crisis years alone. We therefore narrow in on the crisis years in the following section and lastly utilize matching methods to: (1) address selection bias, (2) remove functional form assumptions, and (3) focus on simple averages as opposed to weighted, and potentially non-convex, averages to estimate a treatment effect.

3.2 Cross Section Regression

To explore the relationship between economic freedom and crisis severity more directly, we run a cross-sectional OLS regression with 382 MSAs using outcome

Table 1 Cases of Jumps in MSA-Level Economic Freedom (2002–2007)

Metropolitan Statistical Area	
Beckley, WV	Lawton, OK
Bellingham, WA	Longview, WA
Cape Girardeau, MO-IL	McAllen-Edinburg-Mission, TX
Carson City, NV	Morgantown, WV
Champaign-Urbana, IL	New Bern, NC
Charleston, WV	Odessa, TX
Daphne-Fairhope-Foley, AL	Oklahoma City, OK
Dothan, AL	Parkersburg-Vienna, WV
Enid, OK	Provo-Orem, UT
Florence-Muscle Shoals, AL	Rocky Mount, NC
Houma-Thibodaux, LA	Seattle-Tacoma-Bellevue, WA
Huntington-Ashland, WV-KY-OH	Tulsa, OK
Idaho Falls, ID	Victoria, TX
Jacksonville, NC	Wenatchee, WA

data from the peak of the Great Recession alone. We use the cross-sectional version of Eq. (1) with outcomes averaged using data from the most severe crisis years and economic freedom, along with all controls, held at their initial levels from 2007. Because the exact timing of the crisis differed across locales, we use two separate three-year averages for our outcomes: 2006–2008 and 2007–2009. Our goal here is to capture the trough across all MSAs on average.

If economic freedom and these economic outcomes are still positively associated, this suggests that economically free areas may fair better even during crisis situations. Of course, cross-sectional regressions suffer from significant concerns including omitted variable bias due a lack of fixed effects, simultaneity, and functional form restrictions (i.e., linear regression). Our matching analysis helps us overcome these concerns and is described in the following section.

3.3 Matching analysis

Our goal is to uncover a causal relationship between economic freedom and economic outcomes like unemployment and incomes. However, in doing so we need to address both selection bias and simultaneity concerns. Our matching method is analogous to two-way fixed effects regressions in the sense that we compare the *within* differences in our outcomes across "treated" metropolitan areas. However, matching is a non-parametric method that uses a simple average when estimating the treatment effects. We can therefore avoid the problem of making strong functional form assumptions and the potential of negative weights biasing our results.

Our matching analysis first defines a treatment – a large and sustained increase in economic freedom prior to the Great Recession (between 2002 and 2007). We match these treated MSAs to MSAs that are "similar" but did not experience such reform. In this context, similar implies MSAs that were just as likely to have received the treatment but did not and thus alleviates selection bias concerns. We then compare the

average *change* in the outcome over the subsequent five-year period (e.g., unemployment rate in 2012 – unemployment rate in 2007) for the treated group versus the constructed counterfactual. This latter step represents our Average Treatment Effect on the Treated (ATET) estimate and is important to highlight because it is focused only on a simple average and compares only *changes* in our outcome variables. Because the major concern with matching is the inability to match on unobservables, we follow An and Winship (2017) and difference out these important time-invariant characteristics by focusing on changes in our outcome variables as opposed to levels.[8] Thus, this is analogous to a TWFE model where our focus is on within unit changes in the dependent variable.

We define our treatment as an MSA that experienced a *sustained* jump in economic freedom as measured by the MEFI index of 0.5 points or greater between 2002 and 2007. The treatment must be "sustained" in the sense that their economic freedom scores did not substantially drop more than 50% of its original increase value in the next five years (2007–2012). The choice of 0.5 is arbitrary; we use 0.5 as an initial cut-off as it is roughly two-thirds of a standard deviation in MEFI (0.76) and leaves us with a reasonable number of treatments (28).[9] We explore other potential cut-offs and increase the threshold to a full standard deviation. However, in this case there are only seven treatments and therefore not enough to utilize matching methods. We also reduce the threshold to one-third of a standard deviation (0.25; 109 treatments) and re-estimate our results as a robustness check.[10] While these results generally support our main finding, they are largely insignificant suggesting that the boost in economic freedom needs to be substantial to have a meaningful impact.

Once we define our treatment, we compare treated units to those that did not experience a jump in economic freedom but are similar in important ways. We construct similar, but untreated counterfactuals by matching on important covariates including the industrial structure in 2002 for each MSA using employment shares, a measure of income inequality, industry concentration, initial (2002) levels of our outcome variables[11], economic freedom levels in 2002, and the standard deviation of the MEFI component score in 2002[12]. We also utilize a housing price index to match upon the rate of housing price growth from 2002 to 2007. Details surrounding the sources and construction of these covariates are discussed below in Sect. 4. These are all factors that could potentially influence both the likelihood of treatment (economic freedom reform) and changes in our outcome variables (e.g., income growth). Matching using the initial levels of economic freedom and each economic outcome is especially

[8] Similar methods have been used in the literature to analyze the causal impact of sustained "reform" across a number of dimensions including country level jumps in economic freedom (Grier and Grier 2021), country level improvements in corruption control (Bologna Pavlik et al. 2021), constitutional entrenchment (Callais and Young 2021a, b), changes in a country's rule of law and/or property rights systems (Grier et al. 2021), and jumps in foreign aid levels (Bologna Pavlik and Young 2021).

[9] These twenty-eight cases are reported in Table 1.

[10] These results are available upon request.

[11] The lagged outcome variables are only included as covariates in the appropriate specification. For instance, 2002 real net income per capita is *only* a covariate when we examine changes in real net income per capita and is not included in the other analyses.

[12] The motivation behind the inclusion of this variable is discussed below in Sect. 4.1.

important given that it compares only MSAs that started from the same general economic environment. Note also that our treated MSAs are being matched to counterfactuals only in 2007, so we are comparing post-treatment outcomes between units from the same period.

To construct our counterfactual using the above-mentioned covariates, we employ two alternative matching methods: Propensity Score Matching (PSM) and Mahalanobis Distance Matching (MDM). The former matches each treated unit to a control based on the closest probability of treatment. In other words, the covariates are used to predict whether the MSA experiences an increase in economic freedom between 2002 and 2007. Those with the closest prediction probability are matched. The latter focuses on matching covariates such that they are as close as possible across the treated and control units. For both methods we use the nearest neighbor criterion and alter the number of neighbors from one to three. For PSM, we also use Kernel matching, which weights all untreated MSAs according to the closeness of their propensity scores. Following Grier and Grier (2021), we estimate our standard errors in the Propensity Score method with bootstrapping and utilize Abadie and Imbens' (2011) method of bias-correction for Mahalanobis matching. It is important to consider the results of both matching procedures as the method of matching can result in a different degree of balance across covariates. PSM places a heavier weight on matching the covariates that are important predictors of the treatment, while MDM matches on the covariates directly. Thus, a difference in the results between the two methods could be due to a difference in covariate balance. We present covariate balance tables in **Appendix A1-7** with net (less transfers) income per capita as a reference. Covariate balance tables for all specifications are available upon request.

4 Data

The data used in this paper is divided into three categories: main independent variable, outcome, and controls. We use data from the years 2002, 2007, and 2012. Thus, we include information from both the pre- and post-crisis periods.

4.1 Economic Freedom

We use the Stansel (2013; 2019) economic freedom index available at the metropolitan area level (henceforth referred to as MEFI) as the independent variable of interest. This data is available every 5 years from 1972 to 2012 for 385 US metropolitan areas. For the purposes of this paper, we use only the MEFI scores from 2002, 2007, and 2012 as we are focused on the periods immediately surrounding the Great Recession.

Based off the Fraser Institute's global index (Economic Freedom of the World) and the state and province-level North American index (Economic Freedom of North America), MEFI attempts to quantify the level of economic freedom at the local level. Economic freedom, according to Gwartney et al. (1996), is defined as when "individuals have […] property they acquire without the use of force, […] they are free to use, exchange, or give their property as long as their actions do not violate the identical rights of others. Thus, an index of economic freedom should measure the

extent to which rightly acquired property is protected and individuals are engaged in voluntary transactions" (pg. 12). This local-level economic freedom index uses three major areas: (1) size of government, (2) taxation, and (3) labor market regulations. Size of government and taxation quantify the ability to freely use property, while labor market freedom operationalizes the ability to engage in voluntary transactions within the workforce.

MEFI is constructed on a scale from 0 to 10, with higher scores indicating greater economic freedom. The index is a simple average of three areas. Area 1 (Size of Government) is based on government consumption, transfers and subsidies, and insurance and retirement payments. Area 2 (Taxation) collects data on income and payroll taxes, sales tax revenue, revenue from property tax, and tax revenue from each source except severance taxation (since this is levied at the state level only). Areas 1 and 2 are measured as a share of total metropolitan personal income. Lastly, Area 3 (Labor Market Freedom) scores MSAs based on minimum wage, government employment shares, and private union density. Minimum wage is the share of full-time income as a percentage of per capita personal income; government employment and private union density are shares of total MSA employment.

While MEFI attempts to quantify important variation in economic freedom across metropolitan areas, it is important to discuss its measurement relative to the economic freedom of the world (EFW) index. The most recent version of the EFW index measures economic freedom across 165 countries and is constructed using economic freedom scores across five areas: (1) size of government, (2) legal system and property rights, (3) sound money, (4) freedom to trade internationally, and (5) regulation. Arguably the most important component to long run economic growth and development is Area 2 (e.g., Carlsson and Lundström 2002; Rode and Coll 2012). Area 2 is often used to proxy for a country's rule of law. While there is some variation in the rule of law within a country, this variation is minimal compared to cross-country differences. MEFI mostly relies on local level estimates of Area 1 – size of government – and Area 5 – regulation – to capture differences in economic freedom across areas. Differences in the rule of law, sound money, and trade policy are similar within the U.S.[13] Thus, any result we do find could be interpreted as a lower bound estimate for the benefits of economic freedom more generally.[14]

Another important difference in the EFW versus MEFI measures is the potential variance across each component. The EFW measure is broad and can have substantial variance across component scores within a given country. For example, Bolen and Sobel (2020) highlight several examples where countries score poorly in the legal system and property rights category but receive high scores in other categories resulting in a reasonably high level of economic freedom overall. They compare these examples to other countries with similar levels of overall economic freedom, but with much more uniform scores across each respective component. Their hypothesis is that the variation in component scores should also matter for growth and development and find that the standard deviation in component scores negatively corre-

[13] Murphy (2020) constructs a rule of law measurement at the state-level. However, this is only available for one year and is not considered at the metropolitan level.

[14] This is similar to the argument presented in Dean and Geloso (2021).

lates with economic growth. Given this finding, we additionally include the standard deviation of MEFI components as a control in our regressions. However, we note that the standard deviation in MEFI components (0.757 on average) is much lower than that of the EFW components (1.439 using the most recent data; Gwartney et al. 2021). Moreover, as described in the preceding paragraph, metropolitan areas have implicitly similar scores across several of the EFW components (legal system, sound money, and trade). In line with much of the literature, Bolen and Sobel (2020) highlight the importance of the legal system and property rights score in their study of the variation in component scores. Given that this component is relatively constant within the United States, it is not clear that component variation will have the same impact on economic outcomes as the analogous measure at the country level. Nevertheless, we include the standard deviation as a control.

4.2 Outcome variables

We focus on three important indicators of crisis severity: unemployment rate, employment per 100 persons, and income per capita. Our unemployment rate data comes from the U.S. Bureau of Labor Statistics. The seasonally adjusted unemployment data is provided on a monthly basis; we average the unemployment rate across all twelve months to get annual estimates. Employment per 100 persons is simply total employment adjusted for population. While employment per 100 persons and unemployment rates are similar, there are key distinctions. Employment per 100 counts both full-time and part-time jobs, as well as self-employment. Unemployment rates, however, only account for those people actively in the labor force. It is important to consider both variables when examining crisis recovery.

We also use income per capita as an outcome variable using the Bureau of Economic Analysis's (BEA) measure of personal income. Following Higgins et al. 2006 and Bologna et al. 2016, we exclude transfer payments and thus refer to this measure as a *net* income per capita estimate.[15] We convert income into 2015 US Dollars using the World Bank's estimate of the U.S. GDP deflator. In some specifications, we take the average real net income per capita from 2006 to 2008 and 2007–2009 to focus only on crisis years. We also explore the effect of economic freedom on transfers and total (with transfers included) income per capita, using the same U.S. GDP deflator adjustments.

The use of real net income per capita in studies relating economic freedom to economic outcomes within the United States is common. However, this is potentially problematic when examining the relationship throughout the Great Recession. A major component of the Great Recession was the housing market crash, which had drastic impacts on the cost of living across the U.S. These effects were likely not uniform. We therefore address this concern three ways. First, in our panel data estimates we include a state-specific time-trend in addition to year and metropolitan area fixed effects. This controls for general state level characteristics that change through time, including the potential for changes in the cost of living. Second, for the two cross-sectional specifications we include a control for the average change in the

[15] We also use transfer payments as an outcome variable. This is discussed below in Sect. 5.1.

Table 2 The effect of economic freedom on the unemployment rate, employment per-100 people, and (logged) income per-capita; all controls included

Panel a: Unemployment rate.			
	Panel 2002–2012	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)	(3)
Economic Freedom	-1.207***	-0.805***	-0.892***
	(0.209)	(0.240)	(0.291)
R-Squared	0.93	0.50	0.52
Obs.	1,146	382	382
Panel b: Employment per-100 persons			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	3.877***	1.928***	1.786***
	(0.708)	(0.717)	(0.580)
R-Squared	0.76	0.52	0.54
Obs.	1,146	382	382
Panel c: Net (less transfers) income per capita			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.205***	0.050***	0.040***
	(0.023)	(0.014)	(0.014)
R-Squared	0.78	0.51	0.49
Obs.	1,146	382	382

Notes: Panel regressions include a state-specific time trend in addition to MSA and period fixed effects. Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only. 2007 data is used for all control variables in the cross-sectional regressions given in columns (2) and (3).

housing cost in the relevant period (2006–2008 and 2007–2009, respectively) using the Federal Housing Finance Agency's Housing Price Index available at the state level. We also include the percentage change in this index from 2002 to 2007 as a covariate in our matching specifications.[16] Third, we utilize the Bureau of Economic Analysis's (BEA) regional purchasing power index, available at the metropolitan area level starting in 2008, to adjust personal income (and transfers) per capita and re-estimate our cross-sectional and matching specifications as a robustness check. For the cross-sectional specifications, we utilize the 2008 value to adjust for regional price disparities. For the matching estimates, we utilize both the 2008 and 2012 val-

[16] More specifically, the Federal Housing Finance Agency provides annual estimates for a Housing Price Index (inclusive of all transactions) at the state level from 1975 to 2021. For the cross-sectional regressions, we calculate the average *annual* change in the HPI for the crisis years studied in each specification (2006–2008 and 2007–2009, respectively). For the matching estimates, we calculate the cumulative change in the HPI index from 2002 to 2007 and include this as a covariate to predict economic freedom jumps over the same period. We do not include this variable in our panel estimates as it should be captured in our state-specific time trend.

Table 3 The effect of economic freedom on (logged) transfers per capita and total income per capita; all controls included.

Panel a: Transfers per capita			
	Panel 2002–2012	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)	(3)
Economic Freedom	-0.026	-0.045**	-0.045**
	(0.020)	(0.020)	(0.019)
R-Squared	0.98	0.34	0.36
Obs.	1,146	382	382
Panel b: Total (income plus transfers) income per capita			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.168***	0.036***	0.027***
	(0.019)	(0.011)	(0.010)
R-Squared	0.87	0.50	0.48
Obs.	1,146	382	382

Notes: Panel regressions include a state-specific time trend in addition to MSA and period fixed effects. Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only. 2007 data is used for all control variables in the cross-sectional regressions given in columns (2) and (3).

ues to calculate an RPP adjusted change in income and transfers per capita. This is not a perfect adjustment as the index does not exist prior to 2008 and there were likely important changes in the years leading up to the crisis, however this is an important robustness check. These latter results largely reflect our main findings and are available in Appendix C.[17]

4.3 Other controls: Industry Shares and Inequality

Following Bologna et al. (2016), we include the share of industry employment as controls.[18] In particular, we employ shares from eighteen industries (collected from the BEA): construction, education, farming, federal government, finance and insurance, food, forestry, healthcare, information, manufacturing, mining and extraction, other services, professional, real estate, recreation, retail trade, transportation, and wholesale trade. We also include a measurement of inequality as Cyanmon and Fazzari (2016) argue that inequality explains the slow recovery following the Great Recession. However, here we are limited to a state-level measurement derived from

[17] The regression estimates (Table C1) are quantitatively similar to that of our initial cross-sectional results (Table 2, *Panel C* and Table 3). They are also statistically significant. The results in Tables C2 – C4 lose some statistical significance but reflect the same general pattern – jumps in economic freedom correspond to increases in personal income and reductions in transfers per capita.

[18] Walden (2014), who examines the difference in the recovery post-Great Recession among states, also includes industry shares. However, he operationalizes industry shares as the percentage of income an industry contributes to a state.

Table 4a Summary Statistics

Variable Name	Obs.	Mean	Std. Dev.	Min	Max
Main Dependent Variables:					
Unemployment Rate	1,146	6.121	2.437	2.050	27.892
Unemployment Rate (5-year change)[1]	383	3.380	1.677	0.15	10.217
Real (net, less transfers) income per capita[2]	1,146	32,898	8,416	14,457	105,876
Real (net, less transfers) income per capita (5-year change)[1]	383	0.005	0.076	-0.189	0.524
Employment per 100	1,146	57.333	8.175	25.968	82.751
Employment per 100 (5-year change)[1]	383	-2.964	2.272	-10.914	9.990
Real transfer per capita[2]	1,146	6768	1585	3134	16106
Real transfer per capita (5-year change)[1]	383	0.205	0.042	0.027	0.382
Real total income per capita[2]	1,146	39666	8247	19998	111614
Real total income per capita (5-year change)[1]	383	0.042	0.059	-0.118	0.491
Main Independent Variables:					
Metropolitan Economic Freedom Index	1,146	6.583	0.766	3.846	8.598
Area 1 – Size of Government	1,146	6.620	1.122	2.459	9.130
Area 2 – Taxation	1,146	5.898	0.744	2.055	8.337
Area 3 – Labor Market Regulations	1,146	7.232	1.041	3.235	9.675

[1] Variables are from 2007 through 2012.
[2] Enters regression in logged form.

Frank et al. (2015). Specifically, we take the income shares for the top 10% income earners in each state. Because some MSAs cross state borders, we include the level of inequality in the primary state, as labeled by Stansel (2013; 2019). A summary statistics table for all variables is reported in Table 4a, 4b.

Table 4b Summary Statistics

Variable Name	N	Mean	Std. Dev.	Min	Max
Control Variables – All Specifications:					
Standard Deviation in Areas of MEFI	1,146	0.757	0.320	0.045	2.382
Construction Employment Share	1,146	5.244	2.418	0	13.977
Wholesale Trade Employment Share	1,146	2.096	1.677	0	6.908
Transportation Employment Share	1,146	1.713	1.901	0	13.774
Retail Trade Employment Share	1,146	11.183	2.264	0	16.367
Recreation Employment Share	1,146	1.553	1.085	0	6.439
Real Estate Employment Share	1,146	3.206	1.669	0	9.431
Professional Employment Share	1,146	3.389	2.948	0	18.208
Other Services Employment Share	1,146	5.102	1.820	0	8.970
Mining and Extraction Employment Share	1,146	0.426	1.518	0	20.274
Manufacturing Employment Share	1,146	8.493	5.844	0	41.793
Information Employment Share	1,146	1.201	0.867	0	5.534
Healthcare Employment Share	1,146	6.767	5.772	0	19.714
Forestry and Fishing Employment Share	1,146	0.378	1.264	0	13.619
Food Employment Share	1,146	5.823	3.626	0	33.107
Finance and Insurance Employment Share	1,146	3.626	1.955	0	13.437
Education Employment Share	1,146	1.043	1.227	0	8.692
Federal Government Employment Share	1,146	1.715	1.906	0.167	18.263
Farming Employment Share	1,146	1.908	1.810	0.021	14.535
Top 10 Income Share	1,146	46.018	5.622	33.953	62.171
Herfindahl Index	1,146	0.052	0.020	0.001	0.198
Variables for Cross-Section Only					
HPI Annual % Change 2006–2008	382	1.861	3.051	-4.32	8.877
HPI Annual % Change 2007–2009	382	-2.665	4.518	-14.987	2.930
Variables for Matching Estimates Only					
HPI % Change 2002–2007	382	37.371	22.428	2.567	90.886

5 Results

5.1 Regression analysis

We begin the discussion of the results with our regression analyses for the three main dependent variables: the unemployment rate (*panel a*), employment per 100 persons (*panel b*), and real (net) income per capita (*panel c*). We present these results both without controls (Table 5) and with controls (Table 6) as a comparison. To preserve space, we show estimates for our main variable of interest only (*Economic Freedom*). Full results are available upon request.[19] Column (1) of each table presents our panel estimates with a state-specific time trend and MSA and period fixed effects included.

[19] One interesting facet of the full results is that the coefficient on the standard deviation of the MEFI components variable is opposite of what one would expect given the Bolen and Sobel (2020) study. The standard deviation is negatively associated with unemployment and positively associated with employment and income. As discussed in the previous section, this discrepancy likely stems from the fact that the MEFI index excludes variation in property rights systems which is of primary importance in the country-level Bolen and Sobel (2020) analysis. We encourage future research that explores the variability of the MEFI components and their influence on growth and development within the United States.

Table 5 The effect of economic freedom on the unemployment rate, employment per-100 people, and (logged) income per-capita; no controls.

Panel a: Unemployment rate.			
	Panel 2002–2012	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)	(3)
Economic Freedom	-1.213***	-1.030***	-1.182***
	(0.249)	(0.303)	(0.429)
R-Squared	0.93	0.37	0.31
Obs.	1,146	382	382
Panel b: Employment per-100 persons			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	4.652***	2.689**	2.682**
	(0.904)	(1.117)	(1.178)
R-Squared	0.72	0.23	0.22
Obs.	1,146	382	382
Panel c: Net (less transfers) income per capita			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.214***	0.049***	0.047***
	(0.026)	(0.014)	(0.014)
R-Squared	0.76	0.22	0.21
Obs.	1,146	382	382

Notes: Panel regressions include a state-specific time trend in addition to MSA and period fixed effects. Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only.

Columns (2) and (3) give the cross-sectional estimates for two alternative sets of crisis years (2006–2008 and 2007–2009, respectively).

As can be seen in the tables, economic freedom is significantly related to a lower unemployment rate, higher levels of employment per 100 persons, and increased income per capita. This relation holds both with and without controls included; for both the panel and cross-section estimates. This relationship also appears to be economically meaningful. Using the most conservative estimates given in Table 2, a one standard deviation increase in economic freedom (0.76) corresponds to 0.61-point reduction in the unemployment rate, an increase of 1.36 jobs per 100 persons, and a 3.8% increase in income per capita. For unemployment rates, this explains approximately 25% of a standard deviation (Table 5). The increase in income seems to be the most efficacious impact in that the average 5-year growth rate of income hovered at just above the 4% level in the post-crisis period. Employment per 100 persons is positive but less meaningful explaining only 17% of a standard deviation change.

We also explore whether economically free areas experience better outcomes once transfer payments are included in our income estimates (Table 3)[20]. Tables 5 and 2 show that economic freedom has benefits when considering income coming from productive sources only. However, transfer payments are a particularly important function of governmental intervention throughout times of crisis. As expected, the first panel of Table 3 (*panel a*) shows that transfer payments tend to be lower in economically free areas. *Panel b*, however, shows that despite the lack of this social safety net, total income per capita is higher in MSAs with more economic freedom. Thus, economic freedom can still benefit MSAs throughout a crisis period even when governmental intervention might be most valued.

5.2 Matching analysis

The second part of our analysis utilizes the matching methods described above. Recall that our matching analysis compares post-crisis (2007–2012) recovery in "treated" MSAs with similar "untreated" MSAs. We define an MSA to be treated if it experienced a meaningful jump in economic freedom from 2002 to 2007 (see Table 1 for a list of treated units). The five-year period following the crisis dictated how these metropolitan areas were able to recover; we therefore focus on changes in our outcome variables between 2007 and 2012. If improvements in economic freedom facilitated recovery, this is an important consideration.

Results for the unemployment rate, employment per 100 persons, and real (net) income per capita are given in Tables 6, 7 and 8, respectively. The top portion of the tables presents the Propensity Score Matching (PSM) results, and the corresponding Chi-squared test of overall covariate balance. The null in the Chi-squared test is that the covariates are balanced on average; thus, rejecting the null would imply imbalance. The bottom portion of the tables gives the Mahalanobis results. While an overall covariate balance test analogous to the Chi-square statistic given for PSM is not available for Mahalanobis, we show the pre- and post-match difference in means in the appendix for reference (**Tables A5-7**). For all cases, we first compare our treated MSAs with the full set of potential untreated controls. We then drop controls that were "almost treated"; i.e., had increases in economic freedom that were large (0.25), but did not meet the 0.5 cutoff.

Starting with the unemployment rate, we see that the average change in the unemployment rate was consistently lower in areas that had experienced significant jumps in economic freedom (Table 6). Given the general increase in the unemployment rate across all areas (Table 6), this implies that MSAs that had reforms experienced less severe increases in unemployment. However, only one of these effects are statistically significant and three specifications yield an estimate of the opposite sign (though insignificant). Employment per 100 persons presents more of a mixed result (Table 7). The estimates are mostly negative, implying steeper reductions in employment per 100 persons for economically free areas. However, the signs switch directions across matching methods; these effects are positive for Mahalanobis Nearest

[20] For brevity we report only the results with controls included. Results without controls are mostly unchanged and are available upon request.

Table 6 Effects of a jump in economic freedom on 5-year changes in the unemployment rate

Matching Method	Baseline	Cov. Balance	No "Almost Treated"	Cov. Balance
PSM: Nearest Neighbor	-0.175	15.83	-0.348	11.01
	(0.626)	(0.89)	(0.900)	(0.99)
PSM: Nearest 2 Neighbors	-0.286	5.90	-0.376	9.10
	(0.597)	(1.00)	(0.769)	(1.00)
PSM: Nearest 3 Neighbors	-0.380	5.06	-0.342	9.91
	(0.534)	(1.00)	(0.670)	(1.00)
PSM: Normal Kernel	-0.314	2.42	-0.199	5.38
	(0.475)	(1.00)	(0.723)	(1.00)
Mahalanobis: NN1	0.540	-	-0.627	-
	(0.979)	-	(0.780)	-
Mahalanobis: NN2	-0.745*	-	0.106	-
	(0.403)	-	(0.388)	-
Mahalanobis: NN3	-0.416	-	0.048	-
	(0.275)	-	(0.313)	-

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively. Bootstrapped standard errors are in parentheses using 200 replications for propensity score matching only. For Mahalanobis matching, Abadie-Imbens biased-adjusted standard errors are reported in parentheses. "Cov. Balance" columns report Chi-square tests where the null is that covariates are on average balanced between treated countries and their matches. P-values for Chi-square tests are in parentheses. In "No 'Almost Treated'" column, all MSAs with increases in economic freedom between 0.25 and 0.50 are dropped from the analysis.

Neighbor 2 and 3 in the baseline estimate and for Mahalanobis Nearest Neighbor 1 and PSM Nearest Neighbor 3 after dropping the "almost treated" controls. Three of the estimated effects are statistically significant and negative, suggesting that increases in economic freedom may not lead to consistent increases in employment.

An interesting pattern begins to emerge in Table 8. Economically free areas grew faster, in terms of real (net) income per capita. This finding holds for both PSM and Mahalanobis when looking at our baseline estimates; and for Mahalanobis even after dropping the "almost treated" controls. There is only one instance of a negative coefficient – Mahalanobis Nearest Neighbor 1 – and this effect is statistically insignificant. The magnitude of these estimates are on par with what is uncovered in the regression analysis – anywhere between three and five% increased income per capita. Similar to above, we explore how jumps in economic freedom impact transfers and *total* income per capita (Tables 9 and 10, respectively). We find that economic freedom has a consistent negative effect on transfers per capita and this effect is statisti-

Table 7 Effects of a jump in economic freedom on 5-year changes in employment per 100

Matching Method	Baseline	Cov. Balance	No "Almost Treated"	Cov. Balance
PSM: Nearest Neighbor	-0.926	72.09***	-0.617	15.80
	(0.919)	(0.00)	(0.906)	(0.90)
PSM: Nearest 2 Neighbors	-0.808	11.39	-0.053	9.22
	(0.853)	(0.99)	(0.819)	(1.00)
PSM: Nearest 3 Neighbors	-0.802	9.31	0.022	8.48
	(0.839)	(1.00)	(0.768)	(1.00)
PSM: Normal Kernel	-0.360	3.32	-0.513	5.66
	(0.756)	(1.00)	(0.754)	(1.00)
Mahalanobis: NN1	-4.007**	-	1.476	-
	(1.885)	-	(1.226)	-
Mahalanobis: NN2	0.551	-	-1.164***	-
	(0.821)	-	(0.435)	-
Mahalanobis: NN3	0.033	-	-0.637*	-
	(0.464)	-	(0.364)	-

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively. Bootstrapped standard errors are in parentheses using 200 replications for propensity score matching only. For Mahalanobis matching, Abadie-Imbens biased-adjusted standard errors are reported in parentheses. "Cov. Balance" columns report Chi-square tests where the null is that covariates are on average balanced between treated countries and their matches. P-values for Chi-square tests are in parentheses. In "No 'Almost Treated'" results, all MSAs with increases in economic freedom between 0.25 and 0.50 are dropped from the analysis.

cally significant in six specifications. We also find that total income per capita tends to be higher in areas that experienced economic freedom reform. While these effects are only significant in three of fourteen cases, they are positive across all specifications except for Mahalanobis NN1.

Overall, our results suggest that institutional reform along the lines of economic freedom can bolster recovery within a local economy and improve resiliency. While we cannot say that areas with higher *levels* of economic freedom experienced more rapid recoveries, we can say that increases in economic freedom made several areas relatively better off. This is true even when considering only the most severe crisis years. The exception seems to be employment. Our matching estimates imply that there is some limited evidence that *increases* in economic freedom can lead to reductions in employment per 100 persons.

Table 8 Effects of a jump in economic freedom on 5-year changes in (logged) real net (less transfers) income per capita

Matching Method	Baseline	Cov. Balance	No "Almost Treated"	Cov. Balance
PSM: Nearest Neighbor	0.068*	38.48**	0.042	27.91
	(0.036)	(0.03)	(0.040)	(0.26)
PSM: Nearest 2 Neighbors	0.055*	7.86	0.028	10.00
	(0.032)	(1.00)	(0.036)	(1.00)
PSM: Nearest 3 Neighbors	0.046	4.45	0.034	12.06
	(0.030)	(1.00)	(0.030)	(0.98)
PSM: Normal Kernel	0.049*	3.83	0.027	6.97
	(0.029)	(1.00)	(0.029)	(1.00)
Mahalanobis: NN1	-0.038	-	0.025	-
	(0.050)	-	(0.038)	-
Mahalanobis: NN2	0.089***	-	0.035**	-
	(0.031)	-	(0.016)	-
Mahalanobis: NN3	0.067***	-	0.036**	-
	(0.020)	-	(0.017)	-

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively. Bootstrapped standard errors are in parentheses using 200 replications for propensity score matching only. For Mahalanobis matching, Abadie-Imbens biased-adjusted standard errors are reported in parentheses. "Cov. Balance" columns report Chi-square tests where the null is that covariates are on average balanced between treated countries and their matches. P-values for Chi-square tests are in parentheses. In "No 'Almost Treated'" results, all MSAs with increases in economic freedom between 0.25 and 0.50 are dropped from the analysis.

5.3 Components of Economic Freedom

Our focus is on the general economic environment of a metropolitan area and therefore we have used overall economic freedom as our main variable of interest. However, this index can be decomposed into its three main parts: the size of government, taxation, and labor market regulations. We can use these components to explore whether one (or more) of the three drive our key findings. These results are given in **Appendix B1** – **B7**.

We find that the results using either area 1 (size of government) *or* area 3 (labor market regulations) as our independent variable of interest largely echo results using the overall index. That is, areas with a smaller government size and/or less labor market restrictions tend to experience better economic outcomes. However, these results do not hold when we explore the analogous matching estimates. Using the same rule as with overall freedom, we categorize an MSA as treated if they experience a 2/3rds of a standard deviation jump in the relevant component. This corresponds to 45 treatments for area 1 and 83 treatments in area 3 (labor market freedom). Area 2 (taxation) is incredibly stable as this same rule only yields 2 treatments; the lack of variation here likely explains the insignificant regression results.

Table 9 Effects of a jump in economic freedom on 5-year changes in (logged) transfers per capita

Matching Method	Baseline	Cov. Balance	No "Almost Treated"	Cov. Balance
PSM: Nearest Neighbor	-0.018	41.82**	-0.027*	28.79
	(0.019)	(0.02)	(0.015)	(0.23)
PSM: Nearest 2 Neighbors	-0.023	14.59	-0.029**	19.49
	(0.016)	(0.93)	(0.014)	(0.73)
PSM: Nearest 3 Neighbors	-0.024	10.19	-0.030**	15.86
	(0.015)	(0.99)	(0.014)	(0.89)
PSM: Normal Kernel	-0.024*	2.98	-0.019	5.33
	(0.014)	(1.00)	(0.014)	(1.00)
Mahalanobis: NN1	-0.014	-	-0.064	-
	(0.152)	-	(0.044)	-
Mahalanobis: NN2	-0.039***	-	-0.012	-
	(0.013)	-	(0.013)	-
Mahalanobis: NN3	-0.030***	-	-0.016	-
	(0.009)	-	(0.012)	-

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively. Bootstrapped standard errors are in parentheses using 200 replications for propensity score matching only. For Mahalanobis matching, Abadie-Imbens biased-adjusted standard errors are reported in parentheses. "Cov. Balance" columns report Chi-square tests where the null is that covariates are on average balanced between treated countries and their matches. P-values for Chi-square tests are in parentheses. In "No 'Almost Treated'" results, all MSAs with increases in economic freedom between 0.25 and 0.50 are dropped from the analysis.

These matching estimates yield little in terms of statistical significance over all (see **Table B7**). When digging into the data a bit more, there is surprisingly little overlap between jumps in overall freedom (Table 2) and these individual components (**Table B8** & **B9**). This implies that these individual jumps may not be important enough to trigger major changes in the overall economic environment, rendering them insignificant on their own.

6 Conclusion

The Great Recession was a serious economic crisis that shocked the world – worse than the recession of the early 1980s in the United States. While all areas of the U.S. suffered to some extent, the impact of this crisis was highly variable across the U.S. (Walden 2014; Arias et al. 2016; Bennet et al. 2018).

Table 10 Effects of a jump in economic freedom on 5-year changes in (logged) total (income plus transfers) income per capita

Matching Method	Baseline	Cov. Balance	No "Almost Treated"	Cov. Balance
PSM: Nearest Neighbor	0.024	77.63***	0.013	72.09***
	(0.033)	(0.00)	(0.027)	(0.00)
PSM: Nearest 2 Neighbors	0.025	7.71	0.020	20.94
	(0.029)	(1.00)	(0.024)	(0.64)
PSM: Nearest 3 Neighbors	0.026	7.10	0.025	9.96
	(0.026)	(1.00)	(0.022)	(1.00)
PSM: Normal Kernel	0.026	3.67	0.012	8.01
	(0.023)	(1.00)	(0.021)	(1.00)
Mahalanobis: NN1	-0.004	-	-0.016	-
	(0.024)	-	(0.026)	-
Mahalanobis: NN2	0.039***	-	0.036***	-
	(0.014)	-	(0.014)	-
Mahalanobis: NN3	0.042***	-	0.021	-
	(0.016)	-	(0.013)	-

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively. Bootstrapped standard errors are in parentheses using 200 replications for propensity score matching only. For Mahalanobis matching, Abadie-Imbens biased-adjusted standard errors are reported in parentheses. "Cov. Balance" columns report Chi-square tests where the null is that covariates are on average balanced between treated countries and their matches. P-values for Chi-square tests are in parentheses. In "No 'Almost Treated'" results, all MSAs with increases in economic freedom between 0.25 and 0.50 are dropped from the analysis.

In this paper, we explore the role of economic freedom in both determining the impact of the crisis and the subsequent recovery using metropolitan statistical area (MSA) data. Our results suggest that MSAs with high levels of economic freedom experienced lower unemployment rates, more employment per 100 persons, and higher levels of (net of transfer payments) income per capita. This is even true throughout the most intense of the recession years. We also find that areas that increased their levels of economic freedom before the crisis (2002 to 2007) experienced accelerated recoveries. Taken together, our results suggest that economic freedom can play a significant role in mitigating the impact of economic crises.

We believe this finding leads to many essential questions left to future research. First, what are the exact mechanisms that help economically free areas recover quicker? For example, did these areas experience more innovation and/or entrepreneurial pursuits? Second, what drives economic reform? Relatedly, are there important differences across party lines? Using a regression discontinuity design, Hankins and Hoover (2019) do not find any difference in economic freedom across Democratic versus Republican states. However, this finding does not address changes in economic freedom or differences in policy responses to crises. Understanding the process of reform amongst our 28 treated MSAs could yield useful insights into

reform more generally. The answer to both questions is important to understanding local resiliency.

7 Appendix A – Covariate Balance

Table A1 Covariate balance (≥ 0.50 increase in economic freedom threshold; PSM nearest neighbor; outcome: real net (less transfers) income per capita growth)

		Mean		t-test	
Variable	U/M	Treated	Control	t	p-values
MEFI	U	6.125	6.593	-3.15	0.002***
	M	6.114	6.180	-0.38	0.709
Standard Deviation of Areas	U	0.577	0.681	-1.89	0.059*
	M	0.595	0.643	-0.69	0.495
Real (Net) Inc. per capita (log)	U	10.190	10.335	-3.53	0.000***
	M	10.189	10.170	0.44	0.659
Construction Share	U	5.332	5.284	0.10	0.922
	M	5.377	5.509	-0.20	0.843
Wholesale Trade Share	U	2.292	2.141	0.46	0.645
	M	2.340	2.050	0.58	0.565
Transportation Share	U	1.488	1.577	-0.25	0.805
	M	1.543	1.410	0.30	0.763
Retail Trade Share	U	12.182	11.623	1.27	0.206
	M	12.275	11.618	1.51	0.137
Recreation Share	U	1.001	1.450	-2.14	0.033**
	M	1.038	0.734	1.15	0.257
Real Estate Share	U	2.967	2.723	0.89	0.375
	M	3.004	2.784	0.58	0.566
Professional Services Share	U	2.461	3.207	-1.33	0.185
	M	2.428	2.354	0.12	0.904
Other Services Shares	U	5.662	5.238	1.27	0.206
	M	5.677	5.514	0.12	0.904
Mining & Extraction Share	U	0.929	0.212	3.76	0.000***
	M	0.963	0.056	2.51	0.015**
Manufacturing Share	U	7.079	9.767	-2.14	0.033**
	M	7.119	8.882	-1.50	0.139
Information Share	U	1.153	1.369	-1.16	0.249
	M	1.195	1.038	0.62	0.536
Healthcare Share	U	5.073	6.076	-0.96	0.338
	M	5.020	4.776	0.17	0.862
Forestry and Fishing Share	U	0.359	0.353	0.02	0.981
	M	0.372	0.301	0.34	0.736
Food Services Share	U	4.262	5.550	-1.74	0.083*
	M	4.420	3.130	1.31	0.197
Finance and Insurance Share	U	3.162	3.453	-0.78	0.438
	M	3.162	2.456	1.84	0.071*
Education Share	U	0.739	0.918	-0.79	0.429
	M	0.738	0.541	0.61	0.541

Table A1 Covariate balance (≥ 0.50 increase in economic freedom threshold; PSM nearest neighbor; outcome: real net (less transfers) income per capita growth)

		Mean		t-test	
Federal Government Share	U	2.029	1.755	0.74	0.463
	M	1.912	2.077	-0.35	0.724
Farming Share	U	2.428	2.119	0.76	0.449
	M	2.412	2.498	-0.13	0.893
Top 10 Income Share	U	40.928	41.975	-1.50	0.135
	M	41.045	40.976	0.12	0.906
Herfindahl-Hirschman Index	U	0.045	0.054	-2.04	0.042**
	M	0.046	0.043	0.61	0.542
Housing Price Index (2002 -	U	33.256	37.697	-1.01	0.314
2007% Change)	M	33.681	32.787	0.18	0.860

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively.

Table A2 Covariate balance (≥ 0.50 increase in economic freedom threshold; PSM nearest 2 neighbors; outcome: real net (less transfers) income per capita growth)

		Mean		t-test	
Variable	U/M	Treated	Control	t	p-values
MEFI	U	6.125	6.593	-3.15	0.002***
	M	6.114	6.150	-0.21	0.833
Standard Deviation of Areas	U	0.577	0.681	-1.89	0.059*
	M	0.595	0.600	-0.087	0.943
Real (Net) Inc. per capita (log)	U	10.190	10.335	-3.53	0.000***
	M	10.189	10.199	0.23	0.822
Construction Share	U	5.332	5.284	0.10	0.922
	M	5.377	5.438	-0.09	0.926
Wholesale Trade Share	U	2.292	2.141	0.46	0.645
	M	2.340	2.328	0.02	0.981
Transportation Share	U	1.488	1.577	-0.25	0.805
	M	1.543	1.362	0.41	0.686
Retail Trade Share	U	12.182	11.623	1.27	0.206
	M	12.275	11.859	0.98	0.333
Recreation Share	U	1.001	1.450	-2.14	0.033**
	M	1.038	0.911	0.46	0.644
Real Estate Share	U	2.967	2.723	0.89	0.375
	M	3.004	2.972	0.08	0.933
Professional Services Share	U	2.461	3.207	-1.33	0.185
	M	2.428	2.471	-0.07	0.947
Other Services Shares	U	5.662	5.238	1.27	0.206
	M	5.677	5.764	-0.23	0.822
Mining & Extraction Share	U	0.929	0.212	3.76	0.000***
	M	0.963	0.660	0.55	0.584
Manufacturing Share	U	7.079	9.767	-2.14	0.033**
	M	7.119	8.587	-1.20	0.236
Information Share	U	1.153	1.369	-1.16	0.249
	M	1.195	1.199	-0.01	0.989
Healthcare Share	U	5.073	6.076	-0.96	0.338
	M	5.020	4.144	0.62	0.535

Table A2 Covariate balance (≥ 0.50 increase in economic freedom threshold; PSM nearest 2 neighbors; outcome: real net (less transfers) income per capita growth)

		Mean		t-test	
Forestry and Fishing Share	U	0.359	0.353	0.02	0.981
	M	0.372	0.263	0.56	0.581
Food Services Share	U	4.262	5.550	-1.74	0.083*
	M	4.420	3.863	0.56	0.581
Finance and Insurance Share	U	3.162	3.453	-0.78	0.438
	M	3.162	2.933	0.61	0.548
Education Share	U	0.739	0.918	-0.79	0.429
	M	0.738	0.525	0.65	0.521
Federal Government Share	U	2.029	1.755	0.74	0.463
	M	1.912	1.841	0.16	0.877
Farming Share	U	2.428	2.119	0.76	0.449
	M	2.412	2.116	0.51	0.616
Top 10 Income Share	U	40.928	41.975	-1.50	0.135
	M	41.045	41.233	-0.31	0.760
Herfindahl-Hirschman Index	U	0.045	0.054	-2.04	0.042**
	M	0.046	0.044	0.30	0.769
Housing Price Index (2002 -	U	33.256	37.697	-1.01	0.314
2007% Change)	M	33.681	31.116	0.50	0.617

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively

Table A3 Covariate balance (≥ 0.50 increase in economic freedom threshold; PSM nearest 3 neighbors; outcome: real net (less transfers) income per capita growth).

		Mean		t-test	
Variable	U/M	Treated	Control	t	p-values
MEFI	U	6.125	6.593	-3.15	0.002***
	M	6.114	6.189	-0.45	0.654
Standard Deviation of Areas	U	0.577	0.681	-1.89	0.059*
	M	0.595	0.559	0.52	0.607
Real (Net) Inc. per capita (log)	U	10.190	10.335	-3.53	0.000***
	M	10.189	10.196	-0.16	0.871
Construction Share	U	5.332	5.284	0.10	0.922
	M	5.377	5.326	0.08	0.940
Wholesale Trade Share	U	2.292	2.141	0.46	0.645
	M	2.340	2.433	-0.18	0.855
Transportation Share	U	1.488	1.577	-0.25	0.805
	M	1.543	1.427	0.25	0.800
Retail Trade Share	U	12.182	11.623	1.27	0.206
	M	12.275	12.096	0.41	0.683
Recreation Share	U	1.001	1.450	-2.14	0.033**
	M	1.038	0.912	0.48	0.636
Real Estate Share	U	2.967	2.723	0.89	0.375
	M	3.004	2.879	0.34	0.738
Professional Services Share	U	2.461	3.207	-1.33	0.185
	M	2.428	2.536	-0.16	0.877
Other Services Shares	U	5.662	5.238	1.27	0.206
	M	5.677	5.622	0.13	0.897

Table A3 Covariate balance (≥ 0.50 increase in economic freedom threshold; PSM nearest 3 neighbors; outcome: real net (less transfers) income per capita growth).

		Mean		t-test	
Mining & Extraction Share	U	0.929	0.212	3.76	0.000***
	M	0.963	0.902	0.10	0.919
Manufacturing Share	U	7.079	9.767	-2.14	0.033**
	M	7.119	8.022	-0.71	0.479
Information Share	U	1.153	1.369	-1.16	0.249
	M	1.195	1.114	0.31	0.757
Healthcare Share	U	5.073	6.076	-0.96	0.338
	M	5.020	4.090	0.67	0.503
Forestry and Fishing Share	U	0.359	0.353	0.02	0.981
	M	0.372	0.234	0.76	0.450
Food Services Share	U	4.262	5.550	-1.74	0.083*
	M	4.420	4.048	0.37	0.709
Finance and Insurance Share	U	3.162	3.453	-0.78	0.438
	M	3.162	2.899	0.70	0.489
Education Share	U	0.739	0.918	-0.79	0.429
	M	0.738	0.529	0.64	0.528
Federal Government Share	U	2.029	1.755	0.74	0.463
	M	1.912	1.976	-0.12	0.905
Farming Share	U	2.428	2.119	0.76	0.449
	M	2.412	2.118	0.53	0.601
Top 10 Income Share	U	40.928	41.975	-1.50	0.135
	M	41.045	41.201	-0.27	0.791
Herfindahl-Hirschman Index	U	0.045	0.054	-2.04	0.042**
	M	0.046	0.045	0.24	0.813
Housing Price Index (2002 -	U	33.256	37.697	-1.01	0.314
2007% Change)	M	33.681	30.678	0.60	0.552

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively

Table A4 Covariate balance (≥ 0.50 increase in economic freedom threshold; PSM normal kernel; outcome: real net (less transfers) income per capita growth).

		Mean		t-test	
Variable	U/M	Treated	Control	t	p-values
MEFI	U	6.125	6.593	-3.15	0.002***
	M	6.114	6.221	-0.62	0.535
Standard Deviation of Areas	U	0.577	0.681	-1.89	0.059*
	M	0.595	0.582	0.18	0.860
Real (Net) Inc. per capita (log)	U	10.190	10.335	-3.53	0.000***
	M	10.189	10.207	-0.39	0.697
Construction Share	U	5.332	5.284	0.10	0.922
	M	5.377	5.391	-0.02	0.983
Wholesale Trade Share	U	2.292	2.141	0.46	0.645
	M	2.340	2.341	-0.00	0.998
Transportation Share	U	1.488	1.577	-0.25	0.805
	M	1.543	1.416	0.27	0.789
Retail Trade Share	U	12.182	11.623	1.27	0.206
	M	12.275	11.929	0.75	0.455

Table A4 Covariate balance (≥ 0.50 increase in economic freedom threshold; PSM normal kernel; outcome: real net (less transfers) income per capita growth).

		Mean		t-test	
Recreation Share	U	1.001	1.450	-2.14	0.033**
	M	1.038	0.835	0.74	0.464
Real Estate Share	U	2.967	2.723	0.89	0.375
	M	3.004	2.878	0.34	0.735
Professional Services Share	U	2.461	3.207	-1.33	0.185
	M	2.428	2.322	0.16	0.872
Other Services Shares	U	5.662	5.238	1.27	0.206
	M	5.677	5.687	-0.03	0.980
Mining & Extraction Share	U	0.929	0.212	3.76	0.000***
	M	0.963	0.747	0.39	0.699
Manufacturing Share	U	7.079	9.767	-2.14	0.033**
	M	7.119	7.783	-0.54	0.591
Information Share	U	1.153	1.369	-1.16	0.249
	M	1.195	1.077	0.45	0.654
Healthcare Share	U	5.073	6.076	-0.96	0.338
	M	5.020	3.873	0.83	0.409
Forestry and Fishing Share	U	0.359	0.353	0.02	0.981
	M	0.372	0.303	0.28	0.783
Food Services Share	U	4.262	5.550	-1.74	0.083*
	M	4.420	3.539	0.89	0.380
Finance and Insurance Share	U	3.162	3.453	-0.78	0.438
	M	3.162	2.947	0.54	0.589
Education Share	U	0.739	0.918	-0.79	0.429
	M	0.738	0.485	0.77	0.443
Federal Government Share	U	2.029	1.755	0.74	0.463
	M	1.912	2.008	-0.19	0.853
Farming Share	U	2.428	2.119	0.76	0.449
	M	2.412	2.313	0.17	0.869
Top 10 Income Share	U	40.928	41.975	-1.50	0.135
	M	41.045	41.035	0.02	0.987
Herfindahl-Hirschman Index	U	0.045	0.054	-2.04	0.042**
	M	0.046	0.043	0.65	0.516
Housing Price Index (2002 -	U	33.256	37.697	-1.01	0.314
2007% Change)	M	33.681	30.923	0.56	0.577

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively.

Table A5 Covariate balance (≥ 0.50 increase in economic freedom threshold; Mahalanobis nearest neighbor; outcome: real net (less transfers) income per capita growth

	Standardized Difference in Means	
Variable	Raw	Matched
MEFI	-0.664	-0.656
Standard Deviation of Areas	-0.369	-0.140
Real (Net) Inc. per capita (log)	-0.718	-0.376
Construction Share	0.019	0.100
Wholesale Trade Share	0.082	0.256
Transportation Share	-0.049	0.008

Table A5 Covariate balance (≥ 0.50 increase in economic freedom threshold; Mahalanobis nearest neighbor; outcome: real net (less transfers) income per capita growth

	Standardized Difference in Means	
Retail Trade Share	0.273	0.231
Recreation Share	-0.425	0.115
Real Estate Share	0.162	0.040
Professional Services Share	-0.284	0.308
Other Services Shares	0.265	0.131
Mining & Extraction Share	0.496	0.225
Manufacturing Share	-0.482	-0.274
Information Share	-0.210	0.034
Healthcare Share	-0.195	0.168
Forestry and Fishing Share	0.006	0.172
Food Services Share	-0.348	0.161
Finance and Insurance Share	-0.167	-0.364
Education Share	-0.134	-0.017
Federal Government Share	0.139	0.220
Farming Share	0.145	0.107
Top 10 Income Share	-0.347	-0.366
Herfindahl-Hirschman Index	-0.459	0.099
Housing Price Index (2002–2007% Change)	-0.225	0.145

Table A6 Covariate balance (≥ 0.50 increase in economic freedom threshold; Mahalanobis nearest 2 neighbors; outcome: real net (less transfers) income per capita growth

	Standardized Difference in Means	
Variable	Raw	Matched
MEFI	-0.664	-0.610
Standard Deviation of Areas	-0.369	-0.299
Real (Net) Inc. per capita (log)	-0.718	-0.516
Construction Share	0.019	0.112
Wholesale Trade Share	0.082	0.127
Transportation Share	-0.049	0.005
Retail Trade Share	0.273	0.223
Recreation Share	-0.425	-0.001
Real Estate Share	0.162	0.039
Professional Services Share	-0.284	0.101
Other Services Shares	0.265	0.100
Mining & Extraction Share	0.496	0.173
Manufacturing Share	-0.482	-0.395
Information Share	-0.210	-0.071
Healthcare Share	-0.195	0.228
Forestry and Fishing Share	0.006	0.174
Food Services Share	-0.348	0.109
Finance and Insurance Share	-0.167	-0.264
Education Share	-0.134	0.028
Federal Government Share	0.139	0.229
Farming Share	0.145	0.121
Top 10 Income Share	-0.347	-0.083

Table A6 Covariate balance (≥ 0.50 increase in economic freedom threshold; Mahalanobis nearest 2 neighbors; outcome: real net (less transfers) income per capita growth

	Standardized Difference in Means	
Herfindahl-Hirschman Index	-0.459	-0.008
Housing Price Index (2002–2007% Change)	-0.225	0.085

Table A7 Covariate balance (≥ 0.50 increase in economic freedom threshold; Mahalanobis nearest 3 neighbors; outcome: real net (less transfers) income per capita growth

	Standardized Difference in Means	
Variable	Raw	Matched
MEFI	-0.664	-0.570
Standard Deviation of Areas	-0.369	-0.205
Real (Net) Inc. per capita (log)	-0.718	-0.439
Construction Share	0.019	0.045
Wholesale Trade Share	0.082	0.111
Transportation Share	-0.049	0.019
Retail Trade Share	0.273	0.246
Recreation Share	-0.425	-0.010
Real Estate Share	0.162	0.143
Professional Services Share	-0.284	0.117
Other Services Shares	0.265	0.074
Mining & Extraction Share	0.496	0.227
Manufacturing Share	-0.482	-0.385
Information Share	-0.210	-0.066
Healthcare Share	-0.195	0.105
Forestry and Fishing Share	0.006	0.163
Food Services Share	-0.348	0.048
Finance and Insurance Share	-0.167	-0.161
Education Share	-0.134	0.018
Federal Government Share	0.139	0.211
Farming Share	0.145	0.076
Top 10 Income Share	-0.347	-0.139
Herfindahl-Hirschman Index	-0.459	-0.053
Housing Price Index (2002–2007% Change)	-0.225	0.058

8 Appendix B – Individual Economic Freedom Components

Table B1 The effect of government spending (area 1) on the unemployment rate, employment per-100 people, and (logged) real net (less transfers) income per capita; all controls included.

Panel a: Unemployment rate.

	Panel 2002–2012	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)	(3)
Economic Freedom	-0.411***	-0.594***	-0.694***
	(0.126)	(0.152)	(0.186)
R-Squared	0.93	0.50	0.53

Table B1 The effect of government spending (area 1) on the unemployment rate, employment per-100 people, and (logged) real net (less transfers) income per capita; all controls included.

Panel a: Unemployment rate.			
Obs.	1,146	382	382
Panel b: Employment per-100 persons			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.973***	0.847*	0.867**
	(0.261)	(0.476)	(0.397)
R-Squared	0.73	0.51	0.53
Obs.	1,146	382	382
Panel c: Net (less transfers) income per capita			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.064***	0.018*	0.015
	(0.015)	(0.010)	(0.010)
R-Squared	0.71	0.49	0.48
Obs.	1,146	382	382

Notes: Panel regressions include a state-specific time trend and MSA fixed effects. Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only. 2007 data is used for all control variables.

Table B2 The effect of taxation (area 2) on the unemployment rate, employment per-100 people, and (logged) real net (less transfers) income per capita; all controls included.

Panel a: Unemployment rate.			
	Panel 2002–2012	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)	(3)
Economic Freedom	-0.718***	-0.434**	-0.509**
	(0.175)	(0.192)	(0.227)
R-Squared	0.93	0.41	0.46
Obs.	1,146	382	382
Panel b: Employment per-100 persons			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	2.184***	1.410*	1.229*
	(0.518)	(0.759)	(0.659)
R-Squared	0.74	0.51	0.53
Obs.	1,146	382	382
Panel c: Net (less transfers) income per capita			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.138***	0.046***	0.035**
	(0.022)	(0.015)	(0.016)
R-Squared	0.72	0.50	0.49
Obs.	1,146	382	382

Table B2 The effect of taxation (area 2) on the unemployment rate, employment per-100 people, and (logged) real net (less transfers) income per capita; all controls included.

Panel a: Unemployment rate.

Notes: Panel regressions include a state-specific time trend and MSA fixed effects. Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only. 2007 data is used for all control variables.

Table B3 The effect of labor market regulations (area 3) on the unemployment rate, employment per-100 people, and (logged) real net (less transfers) income per capita; all controls included.

Panel a: Unemployment rate.

	Panel 2002–2012	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)	(3)
Economic Freedom	-0.834***	-0.629***	-0.652**
	(0.155)	(0.205)	(0.249)
R-Squared	0.93	0.48	0.50
Obs.	1,146	382	382
Panel b: Employment per-100 persons			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	3.228***	2.026***	1.846***
	(0.503)	(0.623)	(0.506)
R-Squared	0.78	0.54	0.56
Obs.	1,146	382	382
Panel c: Net (less transfers) income per capita			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.144***	0.051***	0.043***
	(0.016)	(0.015)	(0.014)
R-Squared	0.78	0.52	0.50
Obs.	1,146	382	382

Notes: Panel regressions include a state-specific time trend and MSA fixed effects. Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only. 2007 data is used for all control variables.

Table B4 The effect of government spending (area 1) on transfers per capita and (logged) total (income plus transfers) income per capita; all controls included.

Panel a: Transfers per capita

	Panel 2002–2012	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)	(3)
Economic Freedom	-0.015	-0.028**	-0.028**
	(0.009)	(0.012)	(0.012)
R-Squared	0.98	0.33	0.35
Obs.	1,146	382	382

Table B4 The effect of government spending (area 1) on transfers per capita and (logged) total (income plus transfers) income per capita; all controls included.

Panel a: Transfers per capita			
Panel b: Total (income plus transfers) income per capita			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.051***	0.012	0.009
	(0.013)	(0.008)	(0.008)
R-Squared	0.83	0.48	0.47
Obs.	1,146	382	382

Notes: Panel regressions include a state-specific time trend and MSA fixed effects. Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only. 2007 data is used for all control variables.

Table B5 The effect of taxation (area 2) on transfers per capita and (logged) total (income plus transfers) income per capita; all controls included.

Panel a: Transfers per capita			
	Panel 2002–2012	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)	(3)
Economic Freedom	-0.008	-0.033	-0.034
	(0.012)	(0.023)	(0.021)
R-Squared	0.98	0.33	0.34
Obs.	1,146	382	382
Panel b: Total (income plus transfers) income per capita			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.114***	0.035***	0.025**
	(0.018)	(0.013)	(0.011)
R-Squared	0.84	0.49	0.47
Obs.	1,146	382	382

Notes: Panel regressions include a state-specific time trend and MSA fixed effects. Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only. 2007 data is used for all control variables.

Table B6 The effect of labor market regulation (area 3) on transfers per capita and (logged) total (income plus transfers) income per capita; all controls included

Panel a: Transfers per capita			
	Panel 2002–2012	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)	(3)
Economic Freedom	-0.011	-0.037**	-0.038**
	(0.016)	(0.015)	(0.014)
R-Squared	0.98	0.34	0.36
Obs.	1,146	382	382

Table B6 The effect of labor market regulation (area 3) on transfers per capita and (logged) total (income plus transfers) income per capita; all controls included

Panel a: Transfers per capita			
Panel b: Total (income plus transfers) income per capita			
	Panel	2006–2008	2007–2009
	(1)	(2)	(3)
Economic Freedom	0.119***	0.037***	0.029***
	(0.014)	(0.011)	(0.010)
R-Squared	0.87	0.51	0.49
Obs.	1,146	382	382

Notes Panel regressions include a state-specific time trend and MSA fixed effects. Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only. 2007 data is used for all control variables.

Table B7 Statistically significant estimations for Area 1 (Size of Government) and Area 3 (Labor Market Regulations)

	Area 1 Size of Government	Area 3 Labor Market Regulations
Panel a: 5-year change in the unemployment rate		
	Area 1	Area 3
Jump in Economic Freedom	0/14	0/14
Panel b: 5-year change in employment per 100 persons		
	Area 1	Area 3
Jump in Economic Freedom	-3/14	+3/14
Panel c: 5-year change in net (less transfers) income per capita		
	Area 1	Area 3
Jump in Economic Freedom	+1/14	+14/14
Panel d: 5-year change in transfers per capita		
	Area 1	Area 3
Jump in Economic Freedom	0/14	-14/14
Panel e: 5-year change in total (income plus transfers) income per capita		
	Area 1	Area 3
Jump in Economic Freedom	0/14	+5/14

Table B8 Cases of Jumps in MSA-Level Economic Freedom Area 1 – Size of Government (2002–2007)

Metropolitan Statistical Area	
Albany-Lebanon, OR	Macon-Bibb County, GA
Beckley, WV	Modesto, CA
Bellingham, WA	Morgantown, WV
Bend, OR	Mount Vernon-Anacortes, WA
Birmingham-Hoover, AL	New Bern, NC
Bremerton-Silverdale-Port Orchard, WA	Odessa, TX
Carson City, NV	Olympia-Lacey-Tumwater, WA
Champaign-Urbana, IL	Parkersburg-Vienna, WV
Charleston, WV	Portland-Vancouver-Hillsboro, OR-WA
Charlotte-Concord-Gastonia, NC-SC	Provo-Orem, UT
Corvallis, OR	Rocky Mount, NC
Daphne-Fairhope-Foley, AL	Salem, OR
Decatur, AL	Salt Lake City, UT

Table B8 Cases of Jumps in MSA-Level Economic Freedom Area 1 – Size of Government (2002–2007)

Metropolitan Statistical Area	
Dothan, AL	Seattle-Tacoma-Bellevue, WA
Eugene-Springfield, OR	Spokane-Spokane Valley, WA
Fayetteville, NC	Walla Walla, WA
Grants Pass, OR	Weirton-Steubenville, WV-OH
Hagerstown-Martinsburg, MD-WV	Wenatchee, WA
Huntington-Ashland, WV-KY-OH	Wheeling, WV-OH
Idaho Falls, ID	Wilmington, NC
Jacksonville, NC	Winchester, VA-WV
Kennewick-Richland, WA	Yakima, WA
Longview, WA	

Table B9 Cases of Jumps in MSA-Level Economic Freedom Area 3 – Labor Market Regulation (2002–2007)

Metropolitan Statistical Area	
Alexandria, LA	Kahului-Wailuku-Lahaina, HI
Ames, IA	Kankakee, IL
Auburn-Opelika, AL	Kingsport-Bristol, TN-VA
Baton Rouge, LA	Knoxville, TN
Beaumont-Port Arthur, TX	Lafayette, LA
Bend, OR	Laredo, TX
Bloomington, IL	Lawton, OK
Boise City, ID	Logan, UT-ID
Brownsville-Harlingen, TX	Longview, TX
Cape Girardeau, MO-IL	Lynchburg, VA
Carbondale-Marion, IL	Manhattan, KS
Carson City, NV	McAllen-Edinburg-Mission, TX
Champaign-Urbana, IL	Memphis, TN-MS-AR
Charleston-North Charleston, SC	Mobile, AL
Chattanooga, TN-GA	Morristown, TN
Chicago-Naperville-Elgin, IL-IN-WI	Nashville-Davidson-Murfreesboro-Franklin, TN
Clarksville, TN-KY	New Orleans-Metairie, LA
Cleveland, TN	Norwich-New London, CT
Coeur d'Alene, ID	Odessa, TX
Corpus Christi, TX	Oklahoma City, OK
Danville, IL	Peoria, IL
Daphne-Fairhope-Foley, AL	Pocatello, ID
Davenport-Moline-Rock Island, IA-IL	Provo-Orem, UT
Decatur, AL	Redding, CA
Decatur, IL	Riverside-San Bernardino-Ontario, CA
Dothan, AL	Rockford, IL
Dubuque, IA	Rome, GA
El Paso, TX	San Antonio-New Braunfels, TX
Enid, OK	Savannah, GA
Farmington, NM	Shreveport-Bossier City, LA
Florence-Muscle Shoals, AL	Sioux City, IA-NE-SD
Gulfport-Biloxi, MS	St. George, UT
Hammond, LA	Staunton, VA

Table B9 Cases of Jumps in MSA-Level Economic Freedom Area 3 – Labor Market Regulation (2002–2007)

Metropolitan Statistical Area	
Hanford-Corcoran, CA	The Villages, FL
Hilton Head Island-Bluffton, SC	Tulsa, OK
Hinesville, GA	Tuscaloosa, A
Houma-Thibodaux, LA	Valdosta, GA
Idaho Falls, ID	Victoria, TX
Jackson, MS	Visalia, CA
Jackson, TN	Waterloo-Cedar Falls, IA
Johnson City, TN	Wichita, KS
Johnstown, PA	

9 Appendix C – RPP-Adjusted Income

Table C1 The effect of economic freedom on the (logged) net (less transfers) income per capita, (logged) transfers per capita, and (logged) total income per capita; RPP-adjusted; all controls included

Panel a: Net (less transfers) Income per capita		
	Cross-Section 2006–2008	Cross-Section 2007–2009
	(1)	(2)
Economic Freedom	0.057***	0.047***
	(0.011)	(0.010)
R-Squared	0.46	0.45
Obs.	381	381
Panel b: Transfers per capita		
	2006–2008	2007–2009
	(2)	(3)
Economic Freedom	-0.040*	-0.040*
	(0.023)	(0.023)
R-Squared	0.35	0.36
Obs.	381	381
Panel c: Total (income plus transfers) income per capita		
	2006–2008	2007–2009
	(2)	(3)
Economic Freedom	0.042***	0.033***
	(0.009)	(0.008)
R-Squared	0.42	0.40
Obs.	381	381

Notes: Standard errors are clustered by at the state level. For 2006–2008 data, initial level is average of 2006–2008 values for the dependent variable only. For 2007–2009 data, initial level is average of 2007–2009 values for the dependent variable only. 2007 data is used for all control variables in the cross-sectional regressions given in columns (1) and (2).

Table C2 Effects of a jump in economic freedom on 5-year changes in (logged) RPP-adjusted net (less transfers) income per capita

Matching Method	Baseline	Cov. Balance	No "Almost Treated"	Cov. Balance
PSM: Nearest Neighbor	0.034	13.20	0.010	35.19*
	(0.041)	(0.96)	(0.035)	(0.07)
PSM: Nearest 2 Neighbors	0.028	9.34	0.009	23.24
	(0.038)	(1.00)	(0.032)	(0.51)
PSM: Nearest 3 Neighbors	0.026	6.41	0.015	17.10
	(0.034)	(1.00)	(0.031)	(0.85)
PSM: Normal Kernel	0.032	1.14	0.036	9.35
	(0.031)	(1.00)	(0.031)	(1.00)
Mahalanobis: NN1	0.087*	-	0.008	-
	(0.045)	-	(0.031)	-
Mahalanobis: NN2	0.055**	-	0.058***	-
	(0.028)	-	(0.017)	-
Mahalanobis: NN3	0.042**	-	0.039**	-
	(0.019)	-	(0.018)	-

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively. Bootstrapped standard errors are in parentheses using 200 replications for propensity score matching only. For Mahalanobis matching, Abadie-Imbens biased-adjusted standard errors are reported in parentheses. "Cov. Balance" columns report Chi-square tests where the null is that covariates are on average balanced between treated countries and their matches. P-values for Chi-square tests are in parentheses. In "No 'Almost Treated'" results, all MSAs with increases in economic freedom between 0.25 and 0.50 are dropped from the analysis.

Table C3 Effects of a jump in economic freedom on 5-year changes in (logged) RPP-adjusted transfers per capita

Matching Method	Baseline	Cov. Balance	No "Almost Treated"	Cov. Balance
PSM: Nearest Neighbor	-0.025	18.11	-0.026	23.09
	(0.024)	(0.80)	(0.026)	(0.52)
PSM: Nearest 2 Neighbors	-0.038*	6.25	-0.028	9.70
	(0.021)	(1.00)	(0.023)	(1.00)
PSM: Nearest 3 Neighbors	-0.035*	4.01	-0.036*	10.58
	(0.021)	(1.00)	(0.022)	(0.99)
PSM: Normal Kernel	-0.031	1.37	-0.032	8.21
	(0.020)	(1.00)	(0.023)	(1.00)
Mahalanobis: NN1	0.017	-	-0.036	-
	(0.024)	-	(0.004)	-
Mahalanobis: NN2	-0.030*	-	-0.008	-
	(0.017)	-	(0.016)	-
Mahalanobis: NN3	-0.034**	-	-0.027**	-
	(0.014)	-	(0.014)	-

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively. Bootstrapped standard errors are in parentheses using 200 replications for propensity score matching only. For Mahalanobis matching, Abadie-Imbens biased-adjusted standard errors are reported in parentheses. "Cov. Balance" columns report Chi-square tests where the null is that covariates are on average balanced between treated countries and their matches. P-values for Chi-square tests are in parentheses. In "No 'Almost Treated'" results, all MSAs with increases in economic freedom between 0.25 and 0.50 are dropped from the analysis.

Table C4 Effects of a jump in economic freedom on 5-year changes in (logged) RPP-adjusted total (income plus transfers) income per capita

Matching Method	Baseline	Cov. Balance	No "Almost Treated"	Cov. Balance
PSM: Nearest Neighbor	0.024	14.93	0.002	14.89
	(0.033)	(0.92)	(0.028)	(0.92)
PSM: Nearest 2 Neighbors	0.021	7.35	0.010	18.03
	(0.031)	(1.00)	(0.032)	(0.80)
PSM: Nearest 3 Neighbors	0.017	6.81	0.006	12.81
	(0.029)	(1.00)	(0.025)	(0.97)
PSM: Normal Kernel	0.019	1.54	0.021	8.80
	(0.027)	(1.00)	(0.024)	(1.00)
Mahalanobis: NN1	-0.008	-	0.003	-
	(0.031)	-	(0.042)	-
Mahalanobis: NN2	0.031**	-	0.031*	-
	(0.014)	-	(0.016)	-
Mahalanobis: NN3	0.023	-	0.027*	-
	(0.016)	-	(0.014)	-

Notes: ***, **, & * indicate significance at the .01, .05, and .10 levels, respectively. Bootstrapped standard errors are in parentheses using 200 replications for propensity score matching only. For Mahalanobis matching, Abadie-Imbens biased-adjusted standard errors are reported in parentheses. "Cov. Balance" columns report Chi-square tests where the null is that covariates are on average balanced between treated countries and their matches. P-values for Chi-square tests are in parentheses. In "No 'Almost Treated'" results, all MSAs with increases in economic freedom between 0.25 and 0.50 are dropped from the analysis.

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