Do Economic Downturns Fuel Racial Animus?

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Abstract

We estimate the effect of economic conditions during the Great Recession on racial animus, as measured by Google searches for a commonly used anti-black racial slur and hate crimes against blacks. Our empirical strategy exploits pre-recession cross-state variation in the size of two economic sectors particularly affected by the Great Recession: manufacturing and real estate. We find that states that were dependent on these sectors were hit hardest by the Great Recession, experienced the largest increases in racist internet searches, and experienced the largest increases in hate crimes against blacks.

Keywords: racial attitudes; hate; Google trends; economic conditions

JEL Classification: J15; K42

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1. Introduction

Balancing the interests of diverse groups while protecting vulnerable minorities from racism and other forms of bias is the central challenge of modern pluralistic societies. Animosity and conflict between racial or ethnic groups can threaten social stability, damage institutions and hinder economic performance (Easterly and Levine, 1997; Keefer and Knack, 2002).

Observers have noted signs of increasing animus towards racial, ethnic and religious minorities in the United States. For instance, the Southern Poverty Law Center estimates that there were more than 1,000 bias-related incidents following the 2016 election (Potok, 2017), a dramatic increase relative to previous elections (Keller, 2009); the Council on American Islamic Relations estimates that there were 2,213 anti-Muslim bias incidents in 2016, a 57% increase relative to 2015 (Kaleem, 2017); and the Anti-Defamation League estimates that anti-Jewish incidents increased by 34 percent from 2015 to 2016 (Ziv, 2017).

The extent to which economic conditions fuel animus towards minorities is an open question; the strongest evidence of a causal relationship comes from developing countries and the pre-industrial era. Sharma (2015) found that crimes against marginalized castes in India increased as members of these castes became wealthier. Using European data on European cities for the period 1100-1800, Anderson et al. (2017) showed that colder temperatures reduced agricultural production and intensified the persecution of Jews. More generally, it appears that negative weather shocks generate ethnic and political conflict in developing countries, although it is not clear whether this is due to their economic impact, psychological effects, or some other mechanism (Burke et al., 2015).

Studies of more recent time periods and industrialized countries have produced mixed evidence with regard to whether there is a link between economic conditions and animus

towards minorities. For instance, Krueger and Pischke (1997) found little evidence of a link between unemployment rates and anti-foreigner violence in Germany. By contrast, Falk et al. (2011) found that unemployment at the state level was positively associated with right-wing extremist crime in Germany between 1996 and 1999, while Dustmann et al. (2011), who used survey data from the United Kingdom for the period 1993-94, found that minority respondents reported more harassment when the local unemployment rate increased.[1]

In this study, we explore the relationship between economic conditions and animus against blacks in the United States. Specifically, our interest is in estimating the effect of the Great Recession on Google internet searches for a commonly used anti-black racial slur, known colloquially as the "n-word". This outcome was first used as a measure of racial animus by Stephens-Davidowitz (2014), who showed that it is negatively associated with the vote share for Barack Obama in 2008 even after controlling for a number of demographic, economic and political variables.[2] An advantage of using racist Google searches as an outcome is that they are based on private behavior and therefore less likely than survey questions to be affected by self-censoring and social desirability bias.

Our empirical strategy exploits pre-recession cross-state variation in the size of two sectors that were particularly affected by the Great Recession: manufacturing and real estate. Previous research has shown that job losses during recessions tend to be higher in the manufacturing sector than in other sectors, and that this pattern held true during the Great Recession (e.g. Hoynes et al., 2012). Zhou and Carroll (2012) and Charles et al. (2013) showed that the states most affected by the collapse of the housing market were those that

[1] See also Green et al. (1998), who found no evidence that lynchings in the pre-Depression South were related to economic conditions. Using data from the General Social Survey, Taylor and Mateyka (2011) found that socio-economic status was not associated with the racial attitudes of whites in the late 1990s and early 2000s. By contrast, Mocan and Raschke (2016) found that perceptions of economic well-being are negatively correlated with the strength of racist and xenophobic feelings against foreigners.

[2] Subsequent research has shown that racially charged Google searches are positively associated with black mortality (Chae et al., 2015). See also Chan et al. (2016), who documented a positive relationship between broadband availability and hate crimes against racial minorities. This relationship was more pronounced in counties with levels of racism, as measured by racially charged Google searches (Chan et al., 2016).

experienced the largest pre-recession run-ups in housing demand, housing prices and wealth, all of which are indicators of a strong and growing real estate sector. We corroborate the results of these studies by showing that state economies that were especially dependent on manufacturing and real estate before the Great Recession experienced greater-than-average increases in unemployment (and greater-than-average decreases in GDP) during the post-recession period, 2008-2012.

Next, we turn our attention to the relationship between the pre-recession manufacturing share and racist internet searches. We find that a one standard deviation increase in the pre-recession manufacturing share is associated with a 5.5 percent increase in post-recession racist internet searches. Similarly, a one standard deviation increase in the pre-recession real estate share is associated with a 6.1 percent increase in racist searches. These results suggest that the deterioration in economic conditions during the Great Recession contributed to racial animus in the United States.

Our empirical strategy is similar to that used by Autor et al. (2017), who used initial sectoral employment shares to predict which areas of the U.S. were particularly affected by competition from Chinese imports. One advantage of this strategy is that it avoids possible bias caused by policy responses to the Great Recession. For instance, states differed sharply in how much they extended the duration of unemployment insurance (UI) benefits beginning in 2008 (Farber and Valletta, 2015). The magnitude of the UI extension was determined partly by recent unemployment rates and partly by decisions made by state governments. If the determinants of UI extension were correlated with unobserved changes in racial demographics or attitudes, a simple OLS or fixed effects regression estimates of the relationship between the unemployment rate and racist internet searches would be biased.

Our empirical strategy avoids this pitfall because it is based only on pre-recession sectoral shares that, in turn, determined the severity of the economic downturn. It does, however, rely

on the assumption that unobserved determinants of racial animus were on parallel trends. A potential threat to this assumption comes from the election of President Obama in November 2008, which may have brought underlying, latent racial tensions to the fore. A correlation between these latent tensions and pre-recession sectoral manufacturing and real estate shares could bias our estimates.

We address the election of President Obama and latent racial tensions in two ways. First, we analyze the associations between sectoral shares and several proxies for racial tensions, including survey measures of pre-recession racial attitudes and vote shares for Obama in 2008. We find that these proxies are positively correlated with the pre-recession manufacturing share but are negatively correlated with the real estate share, making it unlikely that our results for both sectors are driven by the same latent racial tensions. As an additional robustness test, we control for interactions between our proxies of pre-recession racial tensions and an indicator for the post-recession period, which allows the effect of baseline racial tensions to change after 2008. Even after controlling for these factors, pre-recession manufacturing and real estate shares are strongly and positively related to racist internet searches.

Finally, we explore the effect of the Great Recession on hate crimes against blacks. The hate crime data come from the FBI Uniform Crime Reports (UCR) Hate Crime Statistics. Under the Hate Crime Statistics Act of 1990, the Attorney General is required to collect data annually on crimes that manifest evidence of prejudice based on race, gender and gender identity, religion, disability, sexual orientation, or ethnicity (U.S. Department of Justice 2012). These data have been used in previous studies, such as Kaushal et al. (2007), Ryan and Leeson (2011) and Mulholland (2013).[3]

[3]While hate crime reporting by local jurisdictions to the UCR is voluntary, it has been estimated that over 80 percent of the U.S. population is covered by a participating agency (Ryan and Leeson, 2011). Despite the extensive coverage, it is important to note that classifying hate crime is difficult (Jacobs and Potter, 2000) and reporting methods differ across jurisdictions (Boyd et al., 1996).

Our results provide strong evidence that the Great Recession contributed to racial animus, raising the possibility that economic policies can help reduce racial tensions in the United States and, more broadly, enhance the stability of multi-ethnic societies.

2. Empirical strategy

We begin by estimating a standard difference-in-differences regression that compares states with high and low shares of employment in manufacturing and real estate before and after the start of the Great Recession:

$$Y_{it} = \alpha_i + \lambda_t + \beta m_i \times Post_t + \gamma r_i \times Post_t + \theta \boldsymbol{X}_i \times Post_t + \varepsilon_{it}. \quad (1)$$

The outcome, Y_{it}, is the logarithm of racist Google searches in state i and year t. The coefficients α_i and λ_t denote state and year fixed effects, $Post_t$ is an indicator for observations from after the start of the Great Recession in 2008, and $\boldsymbol{X}_i$ is a vector of controls. In our baseline specification, this vector includes Census Division fixed effects, demographic characteristics from the 2000 Census (percentage of the population that is Asian, black, and white), as well as pre-recession levels of oil and gas production.[4] The interaction between these variables and the $Post_t$ indicator controls for time-varying effects of racial demographics as well as for the effects of the shale oil boom and changes in oil and gas prices. We cluster standard errors at the state level and restrict our sample to the contiguous 48 states.

The two independent variables of interest, which can be thought of as capturing intensity of treatment, are m_i and r_i. The first, m_i, is the share of state is employment in the manufac-

[4]Estimates without demographic and hydrocarbon controls are qualitatively similar to those reported and discussed below but are less precise and fail the robustness test for parallel trends described by equation 3.

turing sector over the period 2003-05; the second, r_i, is the share of state is employment in the real estate sector over the same period. To facilitate comparison, we express m_i and r_i in terms of standard deviations from the sample mean. For additional statistical power, we also estimate a specification in which these two sectoral shares are summed and expressed as standard deviations from the mean to generate an index of recession vulnerability:[5]

$$Y_{it} = \alpha_i + \lambda_t + \delta index_i \times Post_t + \theta \boldsymbol{X}_i \times Post_t + \varepsilon_{it}. \tag{2}$$

The coefficients β, γ and δ will reflect the effect of economic shocks on racial animus if the unobserved determinants of racial animus were on parallel trends in states with different pre-recession manufacturing and real estate shares. This assumption is violated if the manufacturing and real estate shares were correlated with unobserved state-level characteristics, the effects of which evolved over time. Of particular concern in our context is the election of President Obama in November 2008, which may have exacerbated latent racial tensions. If such tensions were correlated with the pre-recession manufacturing share or the pre-recession real estate share, our identifying assumption would be violated.

In an effort to explore this possibility, we control for several proxies of pre-recession racial tensions, derived from the American National Election Studies (ANES). These proxies, which are interacted with the post-recession indicator, include the average white respondent's score on the group thermometer of feelings towards blacks. In addition, we include the vote share received by Obama in 2008, the percentage of white ANES respondents who agreed that blacks should overcome prejudice and work their way up without any special favors, the percentage who agreed that blacks must try harder to succeed, the percentage who disagreed

[5]For example, $index_i$ takes on the value 3 if a states manufacturing share was one standard deviation above the sample mean and its real estate share was two standard deviations above the mean. This aggregation is based on the assumption that a one standard deviation increase in the sectoral share of either manufacturing or real estate has the same effect on economic conditions. This assumption is supported by the results reported below in Table 1.

that the government should ensure fair jobs and housing for blacks, and the percentage who disagreed that blacks have received less than they deserve over the past few years. The results of this analysis are presented in the online Appendix to this paper.

We also directly test whether racist internet searches in states with different sectoral shares were on parallel trends leading up to the Great Recession by estimating the following regression in which sectoral shares are interacted with an indicator for the year 2007, $Year07_t$:

$$Y_{it} = \alpha_i + \lambda_t + \delta_1 index_i \times Post_t + \delta_2 index_i \times Year07_t + \theta_1 \boldsymbol{X}_i \times Post_t + \theta_2 \boldsymbol{X}_i \times Year07_t + \varepsilon_{it} \quad (3)$$

If pre-recession racist internet search trends were unrelated to employment in manufacturing and real estate, then our estimate of δ_2 should be small and insignificant.

3. Data

Data on racist internet searches come from Google Trends. Following Stephens-Davidowitz (2014), we use the search rate for a commonly used anti-black racial slur, known colloquially as the "n-word", as a proxy for racial animus. Previous research has shown that racist searches on Google are highly correlated with self-reported data on racial attitudes and outperform self-reported attitudes when it comes to predicting actual behavior such as voting for a black political candidate (Stephens-Davidowitz, 2014).

We obtained the rate of racist Google searches for every state-year combination during the period 2005-2012. As discussed by Stephens-Davidowitz (2014), the actual number of

searches for specific terms are not publicly available. Rather, Google Trends makes available the search rate in a given state relative to the state with the highest rate during the relevant time period, which is adjusted to 100, as described by the following formula:

$$R_{it} = N_{it} \times \frac{100}{\max_i N_{it}}, \tag{4}$$

where N_{it} denotes the ratio of searches for the n-word to total number of searches in state i and year t. Thus, $\max_i N_{it}$ is the ratio of searches for the n-word to the total number of searches in the state with the highest rate of racist searches in year t. In our regression analysis, we use the logarithm of R_{it} as the outcome so that the adjustment factor becomes an additive year-specific constant that is captured by the year fixed effects:

$$\ln(R_{it}) = \ln(N_{it}) + \ln(\frac{100}{\max_i N_{it}}). \tag{5}$$

Our regression coefficients can therefore be interpreted as a percentage change in the racist search rate. Another issue arises from the fact that Google Trends does not report search rates for the entire universe of searches but only for a randomly selected subset. Since this subset changes daily, queries of Google Trends submitted on different days will return different values of R_{it}. Since the random subset is fairly large, the differences should be small, particularly for common search terms Stephens-Davidowitz and Varian (2014). Still, to reduce the variance of the sampling error, we obtained values of R_{it} on five different days and used the average of $\ln(R_{it})$ over these 5 draws as our regression outcome.

Data on sectoral employment shares at the state level come from County Business Patterns, published by the U.S. Census Bureau. We use these data to calculate employment shares

in the manufacturing and real estate sectors by state for the baseline period, 2003-2005. Specifically, we calculate:

$$S_{ik} = \frac{\sum_{t=2003}^{2005} M_{ikt}}{\sum_{t=2003}^{2005} M_{it}^{tot}}, \tag{6}$$

where M_{ikt} is employment in state i, sector k, and year t. M_{it}^{tot} is total employment across all sectors in state i and year t. To facilitate interpretation, we convert these shares into z-scores (i.e., standard deviations from the population mean):

$$Z_{ik} = \frac{S_{ik} - S_k}{SD(S_{ik})}. \tag{7}$$

S_k and $SD(S_{ik})$ are the mean and standard deviation of S_{ik} across all 48 states. To increase our statistical power, we conduct an additional analysis that aggregates the z-scores of the manufacturing and real estate sectors to generate an index of vulnerability to the Great Recession: $Z_i^* = Z_i^{manu} + Z_i^{real}$, where Z_i^{manu} and Z_i^{real} are the Z_{ik} scores for the manufacturing and real estate sectors.

Finally, data on pre-recession racial attitudes come from the American National Election Studies (ANES). Specifically, we use ANES data from 2000 and 2004, the last two waves of the survey conducted before the start of the recession. The ANES is a national survey of voters conducted by the University of Michigan and Stanford University before and after every presidential election since 1948. Data from these surveys are available at: http://www.electionstudies.org/.

4. Results

Figure 1 illustrates the state-level cross-sectional variation we exploit in our analyses. Specifically, we shade each state based on the residuals of the manufacturing and real estate shares controlling for Census Division fixed effects and the control variables in equation 1 (i.e., racial demographics and pre-recession hydrocarbon production). States in darker shades had higher pre-recession manufacturing/real estate shares than other states in the same Census Division with similar values of the control variables. The manufacturing and real estate shares are widely dispersed across the country, with relatively little spatial clustering. Moreover, they have distinct geographic distributions (only a handful of states exhibited above-average pre-recession shares in both sectors), suggesting that the results discussed below are not driven by spatially clustered unobservables that are correlated with both the manufacturing and real estate shares.[6]

In Table 1, we report estimates of equation 1 using state-level unemployment and the natural log of GDP as outcomes.[7] The results confirm that the pre-recession manufacturing and real estate shares are associated with a more pronounced deterioration of economic conditions after the start of the recession. Specifically, a one standard deviation increase in the pre-recession manufacturing share is associated with a 0.53 percentage point increase in the post-recession unemployment rate and a 3.9 percent reduction in per-capita GDP. Similarly, a one standard deviation increase in the real estate share is associated with a 0.71 percentage

[6]We also experimented with clustering our estimates at the Census Division level to account for spatial correlation across states in the same geographic region. Although not reported, the results were qualitatively similar to those discussed below.

[7]Unemployment and GDP data come from the Bureau of Labor Statistics and the Bureau of Economic Analysis, respectively. As explained in Section 2, we also control for racial demographics, pre-recession racial attitudes, election results and pre-recession oil and gas production, all interacted with indicators for the post-recession period. Data on racial demographics come from the 2000 Census. Data on pre-recession oil and gas production were obtained from the Energy Information Administration. Election results come from the Federal Election Commission. Our measures of pre-recession racial attitudes were calculated using data from the American National Election Studies for the years 2000 and 2004, the last two waves of the survey conducted before the start of the recession. These data are available at: http://www.electionstudies.org/.

point increase in the unemployment rate and a 3.2 percent reduction in per-capita GDP.

Given that the estimated effects for the two sectors are of similar magnitudes, it is not surprising that we cannot reject the hypothesis that they are equal, which justifies summing to create a single vulnerability index. A one standard deviation increase in this index is associated with a 0.61 percentage point increase in the post-recession unemployment rate and a 3.6 percent decrease in GDP.

In the remaining columns of Table 1, we report estimates of equation 3. Equation 3 includes the interaction between the sectoral shares and an indicator for the year 2007, the last year before the start of the Great Recession.[8] The results provide no evidence that states with above-average manufacturing and real estate shares were experiencing economic difficulties in 2007, which is consistent with the parallel trends assumption of our estimator.

Our baseline estimates using racist internet searches as the outcome are reported in Table 2. The results show that pre-recession manufacturing and real estate shares are associated with substantial increases in racist internet searches after the start of the recession. A one standard deviation increase in the pre-recession manufacturing share is associated with a 5.5 percent higher rate of racist internet searches. Similarly, a one standard deviation increase in the real estate share is associated with a 6.1 percent increase in racist searches, and a one standard deviation increase in the recession vulnerability index is associated with a 5.8 percent increase in racist searches.

Table 3 shows results for Poisson regressions using the number of hate crimes against blacks as the dependent variable.[9] The results are qualitatively similar to those in Table 2. A one

[8]The Great Recession technically began in December 2007, but since our analysis is based on annual data we define our post-recession period to begin in 2008.

[9]We use Poisson regressions instead of logarithmic OLS specifications because several smaller states report zero hate crimes in some years. Results for logarithmic OLS regressions that either drop these states or use ln(hate crimes +1) as the outcome are qualitatively similar and reported in the online Appendix.

standard deviation increase in the pre-recession manufacturing share is associated with a 55 percent ($e^{0.44} - 1 = 0.553$) increase in hate crimes against blacks. One standard deviation increases in the pre-recession real estate share and the aggregate recession vulnerability index are associated with 51 percent and 52 percent increases in hate crimes, respectively. There is no evidence that states that were especially dependent on manufacturing and real estate experienced increases in hate crimes prior to the Great Recession in 2007.

As an additional robustness check, we estimated equation 8, which includes interactions between our index of recession vulnerability and a full set of year fixed effects:

$$Y_{it} = \alpha_i + \lambda_t + \sum_{j=2005}^{2012} \delta_j index_i \times \mathbb{1}(t = j) + \sum_{j=2005}^{2012} \theta_j \boldsymbol{X}_i \times \mathbb{1}(t = j) + \varepsilon_{it}. \tag{8}$$

Point estimates and 95% confidence intervals for the δ_j, the slope coefficients from equation 8, are shown in Figure 2. These coefficients capture how the relationship between our index of recession vulnerability index and racist internet searches evolved over time. The omitted category is 2007, so the other δ_j coefficients capture the slope of the relationship in year j relative to the slope in 2007.

Figure 8 shows that, before 2008, unemployment rates, GDP and racist searches were on parallel states in states with high and low recession vulnerability. Starting in 2008, GDP begins to decrease, while racist searches and hate crimes begin to increase in vulnerable versus less vulnerable states. The unemployment rate does not begin to decrease until 2009, consistent with its status as a lagging indicator of economic performance. The unemployment effect of the recession vulnerability index begins to decrease starting in 2010, but the GDP effect persists over the entire period of observation. The estimated effect of the index on racist internet searches peaks in 2010 and decreases afterwards. By contrast, its estimated effect on hate crimes persists over the entire period of observation. Overall, the graphs in Figure

8 provide evidence that the time-series relationship between sectoral employment shares and racial animus is similar to the relationship between employment shares and economic indicators (i.e., the unemployment rate and GDP), which suggests that our estimates are not driven by spurious correlations caused by pre-treatment trends in unobservables.

In an online appendix, we report the results of additional robustness tests exploring whether our results can be explained by latent racial tensions coming to the fore after the election of President Obama in 2008. If latent tensions were correlated with the manufacturing and real estate shares, and their effect on racist searches was amplified after 2008, the parallel trends assumption of our estimator would be violated. Table A.1 shows that the pre-recession manufacturing share was negatively related to attitudes towards blacks as measured by the ANES, while the pre-recession real estate share was positively correlated with these same attitudes. This pattern of results suggests that latent racial animus coming to the fore is an unlikely explanation for our baseline results: although the pre-recession real estate share is positively related to the increase in racist searches after 2008 (Table 2), it is negatively related to pre-recession measures of attitudes towards blacks. In Tables A.2 and A.3, we report estimates from regressions that control for our proxies for pre-recession racial tensions interacted with an indicator for the post-recession period. Including these additional controls has little effect on our estimates, increasing our confidence that our estimates are not driven by an uptick of latent racial tensions after the 2008 elections.

5. Conclusion

Our results suggest that the Great Recession led to an increase in racial animus in the United States. States that were especially dependent on the manufacturing and real estate sectors before the start of the recession experienced more severe economic downturns as well as larger

increases in racist internet searches and hate crimes against blacks. We find no evidence that this increase in racial animus was driven by a flare-up of latent racial tensions in states with large manufacturing and real estate sectors. Our results raise the possibility that economic policies can help reduce racial tensions in the United States and, more broadly, enhance the stability of multi-ethnic societies.

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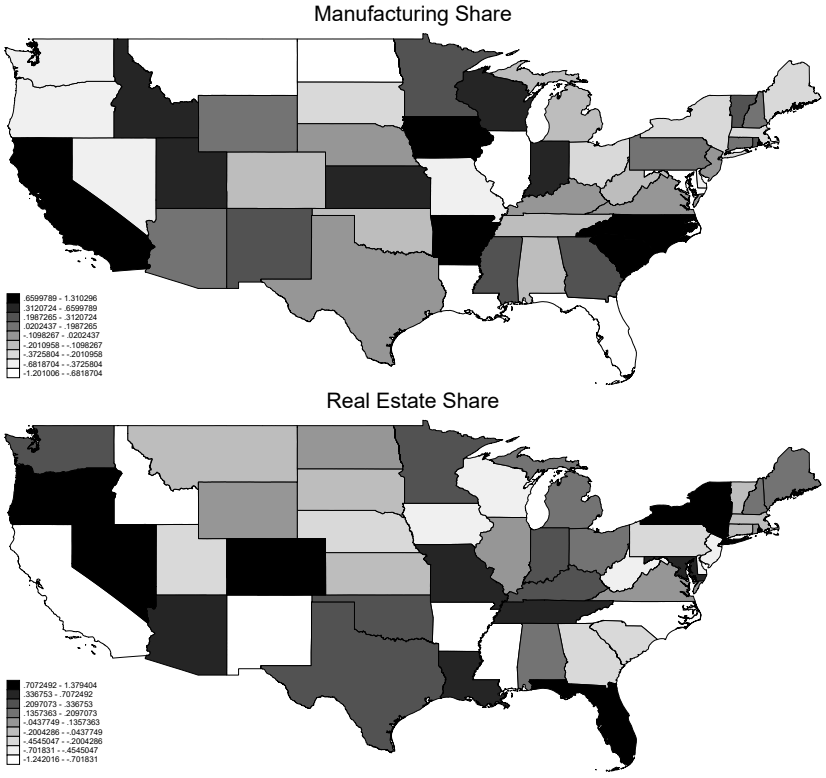
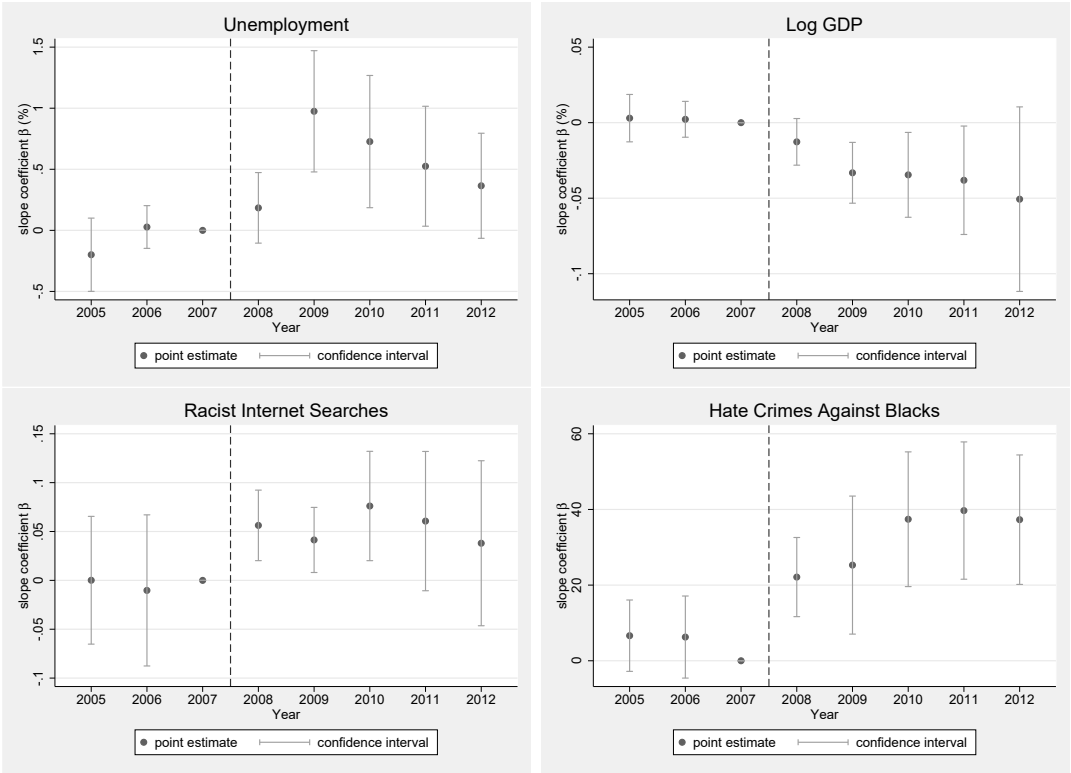
Figure 1. Geographic Distribution of Identifying Variation



The top figure displays the geographic distribution of the residuals of the manufacturing and real estate sectors, after controlling for Census Division fixed effects and the other control variables included in equation 1

Figure 2. Event-Study Regressions



The graphs show the δ_j slope coecients from Equation 8. These coecients capture the slope of the relationship between sectoral employment shares and racist internet searches in a given year. 2007 is the omitted category, so the other δ_j coecients capture the slope in year j relative to the slope in 2007.

Table 1. Sectoral Employment Shares and GDP During the Great Recession

	Unemployment Rate				Ln of Per Capita GDP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Baseline Manufacturing Share × Post 2008	0.53**	0.52**			–0.039**	–0.038**		
	(0.20)	(0.21)			(0.017)	(0.019)		
Baseline Real Estate Share × Post 2008	0.71**	0.70**			–0.032**	–0.033*		
	(0.30)	(0.33)			(0.016)	(0.017)		
Recession Vulnerability Index × Post 2008			0.61***	0.61***			–0.036**	–0.035**
			(0.20)	(0.21)			(0.015)	(0.017)
Baseline Manufacturing Share × Year = 2007		–0.016				0.0024		
		(0.082)				(0.0053)		
Baseline Real Estate Share × Year = 2007		–0.0084				–0.00059		
		(0.12)				(0.0068)		
Recession Vulnerability Index × Year = 2007				–0.014				0.0014
				(0.079)				(0.0050)
No. of states	48	48	48	48	48	48	48	48
No. of observations	384	384	384	384	384	384	384	384

The period of observation is 2005-2012. All specifications control for state and year fixed effects, as well as indicators for the post-2008 period interacted with Census-Division fixed effects, baseline hydrocarbon production, and white, black and Asian population shares. OLS estimates are reported. Standard errors, clustered at the state level, are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Table 2. Economic Shocks and Racist Internet Searches

	Racist Searches			
	(1)	(2)	(3)	(4)
Baseline Manufacturing Share × Post 2008	0.055***	0.060**		
	(0.021)	(0.024)		
Baseline Real Estate Share × Post 2008	0.061**	0.075**		
	(0.023)	(0.028)		
Recession Vulnerability Index × Post 2008			0.058***	0.065***
			(0.020)	(0.024)
Baseline Manufacturing Share × Year = 2007		0.013		
		(0.027)		
Baseline Real Estate Share × Year = 2007		0.042		
		(0.029)		
Recession Vulnerability Index × Year = 2007				0.023
				(0.027)
No. of states	48	48	48	48
No. of observations	384	384	384	384

The period of observation is 2005-2012. All specifications control for state and year fixed effects, as well as indicators for the post-2008 period interacted with Census-Division fixed effects, baseline hydrocarbon production, and white, black and Asian population shares. OLS estimates are reported. Standard errors, clustered at the state level, are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Table 3. Economic Shocks and Hate Crime: Poisson Estimates

	Hate Crimes			
	(1)	(2)	(3)	(4)
Baseline Manufacturing Share × Post 2008	0.44***	0.42***		
	(0.11)	(0.11)		
Baseline Real Estate Share × Post 2008	0.41***	0.38***		
	(0.11)	(0.11)		
Recession Vulnerability Index × Post 2008			0.42***	0.40***
			(0.100)	(0.098)
Baseline Manufacturing Share × Year = 2007		–0.044		
		(0.089)		
Baseline Real Estate Share × Year = 2007		–0.085		
		(0.068)		
Recession Vulnerability Index × Year = 2007				–0.065
				(0.074)
No. of states	48	48	48	48
No. of observations	380	380	380	380

The period of observation is 2005-2012. All specifications control for state and year fixed effects as well as indicators for the post-2008 period interacted with Census-Division fixed effects, baseline hydrocarbon production, and white, black and Asian population shares. Poisson coefficients are reported. Standard errors, clustered at the state level, are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Online Appendix:

Robustness to controlling for baseline racial attitudes

In this online appendix, we explore whether our results can be explained by latent racial tensions coming to the fore after the election of President Obama in 2008. If latent tensions were correlated with the manufacturing and real estate shares, and their effect on racist searches was amplified after 2008, the parallel trends assumption of our estimator would be violated.

We begin by exploring whether pre-recession sectoral employment shares were related to survey measures of pre-recession racial attitudes or the vote share for President Obama in the 2008 election. Table A.1 shows that the pre-recession manufacturing share was negatively related to attitudes towards blacks as measured by our five proxies of pre-recession racial tensions from the ANES. By contrast, the pre-recession real estate share was positively correlated with these same attitudes. Likewise, consistent with the hypothesis that racial animus reduced support for Obama in 2008 (Stephens-Davidowitz, 2014), the vote share for Barack Obama was negatively correlated with the manufacturing share of employment but positively correlated with the real estate share. Importantly, this pattern of results suggests that latent racial animus coming to the fore is not a good explanation for our baseline results: although the pre-recession real estate share is positively related to racist searches after 2008 (Table 2), it is negatively related to pre-recession measures of attitudes towards blacks.

In Tables A.2 and A.3 , we report the results of additional robustness tests that control for our proxies for pre-recession racial tensions interacted with an indicator for the post-recession period. In the first column of either table, we show that controlling for the vote share for

Barack Obama interacted with an indicator for the post-recession period has little effect on our estimates, which remain similar to those reported in Table 2 and 3. Likewise, controlling for survey measures of racial attitudes has little additional effect on the estimated effect of either sectoral share. Finally, including these additional controls has a negligible effect on our estimates using the aggregate recession vulnerability index. Overall, the estimates reported in Tables A.2 and A.3 increase our confidence that our estimates are not driven by a flare-up of latent racial tensions after the 2008 elections.

Table A.1. Correlation Between Sectoral Employment Shares and Proxies for Latent Racial Tensions

	Manufacturing share	Real estate share
% agree that blacks should overcome prejudice without special favors	0.09	-0.02
% agree that blacks must try harder to succeed	0.35	-0.09
% disagree that government should ensure fair jobs and housing for blacks	0.06	-0.19
% disagree that blacks have gotten less than they deserve	0.21	-0.08
Average score on group thermometer towards black people	-0.18	0.20
% vote for Barack Obama in 2008	-0.13	0.23

The table displays coefficients of correlation between sectoral employment shares and several proxies for latent racial tensions. For the survey measures in the first five rows, the sample is restricted to the 47 states for which ANES data is available for 2000 and 2004.

Table A.2. Economic Shocks and Racist Internet Searches: Controlling for Baseline Racial Attitudes

	Racist Searches			
	(1)	(2)	(3)	(4)
Baseline Manufacturing Share × Post 2008	0.064***		0.066***	
	(0.020)		(0.023)	
Baseline Real Estate Share × Post 2008	0.058***		0.067***	
	(0.020)		(0.021)	
Recession Vulnerability Index × Post 2008		0.061***		0.066***
		(0.019)		(0.020)
Obama Vote Share 2008 × Post 2008	0.43*	0.41*	0.45*	0.45*
	(0.22)	(0.23)	(0.24)	(0.25)
Avg. group thermometer towards blacks × Post 2008			–0.0013	–0.0013
			(0.0012)	(0.0012)
% oppose special favors for blacks × Post 2008			0.039	0.039
			(0.082)	(0.081)
% agree blacks must try harder × Post 2008			0.0059	0.0067
			(0.11)	(0.11)
% disagree blacks received less than deserve × Post 2008			0.027	0.026
			(0.10)	(0.096)
% oppose gov. ensure fair jobs/housing for blacks × Post 2008			0.036	0.036
			(0.094)	(0.094)
No. of states	48	48	47	47
No. of observations	384	384	376	376

The period of observation is 2005-2012. All specifications control for state and year fixed effects, as well as indicators for the post-2008 period interacted with Census-Division fixed effects, the state's baseline hydrocarbon production, and white, black and Asian population shares. OLS estimates are reported. Standard errors, clustered at the state level, are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Table A.3. Economic Shocks and Hate Crimes: Controlling for Baseline Racial Attitudes

	Hate Crimes (Poisson)			
	(1)	(2)	(3)	(4)
Baseline Manufacturing Share × Post 2008	0.40***		0.48***	
	(0.11)		(0.11)	
Baseline Real Estate Share × Post 2008	0.50***		0.59***	
	(0.12)		(0.12)	
Recession Vulnerability Index × Post 2008		0.45***		0.52***
		(0.11)		(0.11)
Obama Vote Share 2008 × Post 2008	–2.87***	–2.17***	–2.68***	–2.03**
	(0.93)	(0.80)	(0.93)	(0.83)
Avg. group thermometer towards blacks × Post 2008			–0.016**	–0.015**
			(0.0073)	(0.0075)
% oppose special favors for blacks × Post 2008			–0.094	–0.13
			(0.28)	(0.29)
% agree blacks must try harder × Post 2008			0.12	0.22
			(0.33)	(0.31)
% disagree blacks received less than deserve × Post 2008			0.11	–0.051
			(0.52)	(0.50)
% oppose gov. ensure fair jobs/housing for blacks × Post 2008			0.093	0.044
			(0.36)	(0.35)
No. of states	48	48	47	47
No. of observations	380	380	372	372

The period of observation is 2005-2012. All specifications control for state and year fixed effects, as well as indicators for the post-2008 period interacted with Census-Division fixed effects, the state's baseline hydrocarbon production, and white, black and Asian population shares. Poisson coefficients are reported. Standard errors, clustered at the state level, are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Robustness of hate crime results to functional form

Table A.4. Economic Shocks and Hate Crime: Log-Linear Regressions

	Ln(Hate Crimes)			
	(1)	(2)	(3)	(4)
Baseline Manufacturing Share × Post 2008	0.37***	0.37***		
	(0.12)	(0.11)		
Baseline Real Estate Share × Post 2008	0.36***	0.38***		
	(0.13)	(0.13)		
Recession Vulnerability Index × Post 2008			0.36***	0.41***
			(0.11)	(0.097)
Baseline Manufacturing Share × Year = 2007		0.018		
		(0.099)		
Baseline Real Estate Share × Year = 2007		0.059		
		(0.070)		
Recession Vulnerability Index × Year = 2007				0.027
				(0.083)
No. of states	42	42	42	42
No. of observations	336	336	336	336

The period of observation is 2005-2012. All specifications control for state and year fixed effects, as well as indicators for the post-2008 period interacted with Census-Division fixed effects, baseline hydrocarbon production, and white, black and Asian population shares. Six states report zero hate crimes in one or more years and are excluded from the regressions (Alabama, Georgia, Mississippi, New Mexico, North Dakota, and Wyoming). OLS estimates are reported. Standard errors, clustered at the state level, are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Table A.5. Economic Shocks and Hate Crime: Log-Linear Regressions

	Ln(Hate Crimes)			
	(1)	(2)	(3)	(4)
Baseline Manufacturing Share × Post 2008	0.29*	0.32**		
	(0.14)	(0.13)		
Baseline Real Estate Share × Post 2008	0.31**	0.33***		
	(0.12)	(0.11)		
Recession Vulnerability Index × Post 2008			0.30**	0.33***
			(0.13)	(0.11)
Baseline Manufacturing Share × Year = 2007		0.11		
		(0.12)		
Baseline Real Estate Share × Year = 2007		0.058		
		(0.090)		
Recession Vulnerability Index × Year = 2007				0.093
				(0.11)
No. of states	48	48	48	48
No. of observations	380	380	380	380

The period of observation is 2005-2012. All specifications control for state and year fixed effects, as well as indicators for the post-2008 period interacted with Census-Division fixed effects, baseline hydrocarbon production, and white, black and Asian population shares. Observations with zero hate crimes are assigned a value of ln(hate crimes) = 0 to allow estimation. OLS estimates are reported. Standard errors, clustered at the state level, are in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.