RUGGED INDIVIDUALISM AND COLLECTIVE (IN)ACTION
DURING THE COVID-19 PANDEMIC

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ABSTRACT

Rugged individualism—the combination of individualism and anti-statism—is a prominent feature of American culture with deep roots in the country's history of frontier settlement. Today, rugged individualism is more prevalent in counties with greater total frontier experience (TFE) during the era of westward expansion. While individualism may be conducive to innovation, it can also undermine collective action, with potentially adverse social consequences. We show that America's frontier culture hampered the response to the COVID-19 pandemic. Across U.S. counties, greater TFE is associated with less social distancing and mask use as well as weaker local government effort to control the virus. We argue that frontier culture lies at the root of several more proximate explanations for the weak collective response to public health risks, including a lack of civic duty, partisanship, and distrust in science.

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1 Introduction

Individualism is often associated with resourcefulness and innovation. However, it may also hinder collective action. In the context of infectious disease epidemics, non-pharmaceutical interventions (NPIs) like social distancing and mask use can be key components of effective public health responses. During the COVID-19 pandemic, adoption of these practices has varied widely across and within countries. This variation has important consequences for the spread of the virus, but its origins remain widely debated. We argue that individualism is an important driving factor.

This paper shows that America's culture of rugged individualism—the combination of individualism and opposition to government intervention—undermined collective action against COVID-19. The public health response to COVID-19 has been significantly weaker in U.S. localities with a longer frontier history, which Bazzi et al. (forthcoming) identify as a key driver of rugged individualism.

During the process of westward expansion that marked the early history of the U.S., the frontier rewarded independence and self-reliance. Frontier settlers had opportunities for upward mobility but also faced significant challenges, with little social infrastructure to turn to. As suggested by Turner (1893), frontier locations were historically more individualistic. Our prior work shows that this distinctive culture persisted: localities that spent more time on the frontier exhibit greater individualism and anti-statism in the long run. Rugged individualism cuts across known cultural divides in the U.S., including urban–rural and north–south, and thus sheds new light on the stark geographic variation in opposition to effective public health efforts to contain COVID-19.

We identify a weaker response to the pandemic in counties with greater total frontier experience (TFE, the duration of exposure to frontier conditions historically). This can be seen in the responses of residents as well as local governments. We measure social distancing with mobility data before and after the national pandemic declaration on March 13, 2020, estimating event-study specifications with county fixed effects. While high- and low-TFE counties exhibit little difference in mobility before this date, a sharp differential emerges thereafter as residents of high-TFE counties are less likely to avoid non-essential trips outside the home.

We also find that greater TFE is associated with less use of face masks in public space, another important response to curb infectious disease transmission. Residents in high-TFE counties are significantly more likely to report never, rarely, or only sometimes using masks when outside the home. While this outcome is only observed in early July 2020, the stark cross-sectional differences in mask use are consistent with the event-study results on social distancing.

The negative influence of TFE on social distancing and mask use is not due to confounding demographic and climatic differences. We consider a host of factors emphasized in prior work on COVID-19, including population density, temperature, income, education, and racial composition. Contemporary population density in particular is closely connected to historical settlement patterns. We show that the effects of TFE remain sizable even after flexibly accounting for the time-varying relationship between density and social distancing.

The sluggish pandemic response among residents of high-TFE counties is mirrored by the inaction of local government. We show that policymakers in high-TFE counties are significantly less likely to enact NPIs to control the spread of the virus, including emergency declarations, stay-at-home policies, and

mask-use mandates. While many NPIs are enacted by state governments, our results are based only on cross-county policy variation within states. Weak voluntary distancing and mask use go hand-in-hand with weak official efforts to fight COVID-19.

Both defining features of rugged individualism plausibly undermine collective action in response to public health crises. The implications of individualism are straightforward. The primacy of personal goals over group goals and the regulation of behavior by personal attitudes rather than social norms—two key dimensions of individualism—are likely to weaken voluntary social distancing and mask use. Both actions require people to internalize externalities, a key dimension of the response to infectious diseases (Althouse et al., 2010). In the case of NPIs to limit the spread of COVID-19, there are salient positive externalities. Young people have to comply with distancing even when they may perceive their risks as negligible. Individuals sometimes have to comply with strict isolation even if they are asymptomatic. Mask use is considered more protective of others than oneself. In these cases, the social returns to preventive action are much larger than the private returns.

The negative effects of individualism on collective action resonate with recent work on the pandemic. In their discussion of social and behavioral science insights on the pandemic response, Van Bavel et al. (2020) point to cultural explanations, specifically related to varying degrees of individualism. Frey et al. (2020) show that social mobility declined less in individualistic countries, while Germani et al. (2020) suggest, based on survey data from Italy, that individualistic traits hinder protective behaviors. Our findings on the link between frontier experience and social distancing within the U.S. are concurrent with those of Bian et al. (2020). Our study shows that rugged individualism, with its deep roots in American history, hinders not only voluntary responses but also public policies to fight COVID-19 spread, and that it underlies many proximate explanations for the weak pandemic response across the U.S.

The lack of civic duty is an important channel through which rugged individualism may hamper COVID-19 responses. Several recent papers show that voluntary social distancing is associated with civic culture, i.e., prosocial preferences such as reciprocity, trust, cooperation, and propensity to contribute to the public good (Barrios et al., 2020; Bartscher et al., 2020; Brodeur et al., 2020; Durante et al., 2020; Dincer and Gillanders, 2020). While individualism and civic culture are not necessarily at odds, we show that TFE (and, by implication, rugged individualism) indeed has a negative association with civic culture (proxied by voter turnout as in Barrios et al., 2020).

The other defining feature of rugged individualism, opposition to government intervention, is also likely to deter effective public health responses. Local officials with anti-statist constituencies are bound to adopt policy stances that align with the strong opposition of their voters to government intervention in its various forms, including coordinated public health efforts. In Bazzi et al. (forthcoming), we show that TFE is associated with opposition to tax redistribution and welfare spending, as well as to the Affordable Care Act (ACA), a salient policy for gauging preferences over public intervention in healthcare.

Moreover, rugged individualism has implications for understanding how partisanship has affected collective action against COVID-19. Bazzi et al. (forthcoming) show that high-TFE counties exhibit stronger (and increasing) support for the Republican Party between 2000 and 2016—a period in which Republican platforms have leaned more and more against government intervention in multiple dimensions, including health and welfare policies. In many respects, the Republican Party has come to embrace the sort of anti-statism at the heart of frontier culture. It is therefore unsurprising that Republican voters

engage in less voluntary social distancing and less mask use, and express less support for social distancing policies (Allcott et al., 2020; Barrios and Hochberg, 2020; Milosh et al., 2020; Painter and Qiu, 2020). At the same time, Republican governors have been less prone to issue stay-at-home advisories (Baccini and Brodeur, 2020). Our results are consistent with partisan identity and beliefs being an important channel through which rugged individualism has undermined the COVID-19 response.

Another potentially important mechanism concerns distrust in science, which may partly reflect opposition to hierarchies and elites. Such attitudes are pervasive in frontier culture. In the context of COVID-19, distrust in science may reduce risk perceptions, thereby diminishing voluntary social distancing and mask use as well as more general compliance with public health advisories (see, e.g., Brzezinski et al., 2020). We assess the implications of TFE along this dimension by examining an issue in which distrust in science plays a central role: beliefs regarding climate change. We find that high-TFE counties exhibit significantly lower prevalence of beliefs that climate change is happening.

Overall, our findings illustrate a fundamental role for America's frontier culture in shaping collective action in the face of a public health emergency. Individualism weakens voluntary prevention efforts and undermines support for policy intervention. Opposition to government intervention not only reinforces individual non-compliance with NPIs but also stifles policy coordination across county lines. The social science literature has offered a range of explanations for the weak pandemic response in the U.S. We argue that many of these proximate factors have common, deep roots in the country's frontier history.

The paper proceeds as follows. Section 2 describes the data and empirical framework. Section 3 reports our main results on TFE and the evolution of social distancing, mask use, and government policies to fight COVID-19 across U.S. counties. Section 4 explores the relationship of frontier culture with different proximate explanations for collective inaction against COVID-19. Section 5 concludes.

2   Empirical Strategy

2.1   Data

Our measure of total frontier experience (TFE) comes from Bazzi et al. (forthcoming). This paper tracks frontier settlement from 1790 onward, identifying the frontier line in each year as the contour beyond which population density falls below 2 people per square mile. Counties within 100 km of this line and with population less than 6 people per square mile are defined as frontier counties. This historically-grounded definition of the frontier captures both dimensions of frontier life: population sparsity and isolation from urban centers. We then construct a novel, county-level measure of TFE, which captures the number of years that each county spent on the frontier from 1790 to 1890, the end of the frontier era according to Turner (1893) and the U.S. Census Bureau. The geographic variation in TFE can be seen in Appendix Figure A.1, reproduced from Bazzi et al. (forthcoming). Our baseline analysis focuses on the 2,036 heartland counties whose entire frontier history can be observed from 1790 to 1890. Robustness checks extend to the West Coast and 20th century frontier.

We capture individual and policy responses to the pandemic with measures of social distancing, mask use, and local NPIs. Our core time-varying outcome of interest is social distancing. We consider two proxies based on mobility data. First, we use the Social Distancing Scoreboard from Unacast. This location-based data from cellphones captures the number of non-essential visits to locations outside

the home. Second, we use Google COVID-19 Community Mobility Reports, which measure the percent change in visits to six types of destinations: workplaces, residential, grocery and pharmacy, parks, transit stations, and retail and recreation. We focus on mobility around workplaces for comparability with Unacast.[1] Both data sources provide mean county-level mobility measures through August 2020 and are reported relative to pre-pandemic reference dates (i.e., a value of 60% implies that social mobility is 60% of what it was prior to the pandemic). The Unacast and Google data cover 1,378 and 1,872 counties in our sample, respectively.[2]

Starting in early March 2020, both the Unacast and Google data show steep and abrupt reductions in social mobility. This has been discussed at length in prior research and in the popular press. Figure 1 reveals a novel feature of this declining mobility, namely that it was more pervasive in low-TFE counties.[3] Looking across the two outcomes, residents of counties in the top 25% of TFE (26–63 years) practice roughly 10–20% less social distancing than those in the bottom 25% (TFE from 0 to 11 years). This sizable gap emerges rather suddenly in mid-March and sustains for several months thereafter. Although suggestive of a link with frontier culture, this pattern could be due to any number of factors that might be correlated with TFE and social distancing. Our empirical strategy, explained in the next section, aims at ruling out such confounders of the relationship between TFE and the pandemic response.

Figure 1: TFE and Social Distancing: Basic Patterns

(a) Non-Essential Visits
(Unacast)

(b) Time at Workplaces
(Google Community Mobility)
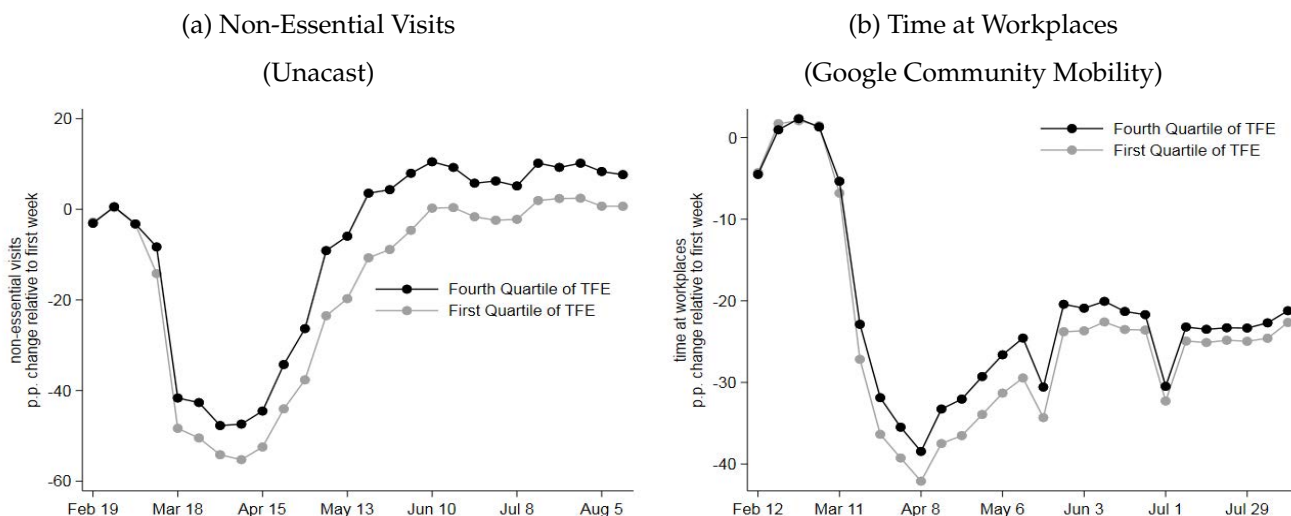
Notes: These graphs plot the evolution of social mobility since the beginning of reporting for each series in early 2020. Each measure reflects a weekly average mobility over all days in the week relative to the first day-of-the-week in the series. The averaging explains why the series does not begin at 0. The dark black (light gray) line corresponds to counties with total frontier experience in the top quartile (bottom quartile).

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[1]Workplace and residential comprise the bulk of mobility, and results for time at residential areas are roughly the mirror image of the results for time at workplaces. Unacast also reports measures of distance traveled and human encounters that deliver similar insight.

[2]The set of counties missing from the Unacast data remains stable over time while, for a subset of counties, the Google data are available in some periods but not others. Our event study results are robust to restricting to those counties observed over the entire period and to reweighting counties according to their odds of being observed, estimated as a logit function of TFE and the baseline covariates described below.

[3]The Unacast and Google data exhibit differences in the extent of recovery to pre-pandemic mobility levels. The former is apparently more sensitive to seasonality than the latter. Regardless of these differences, the use of time fixed effects in our empirical strategy ensures that seasonality will not be a confounding factor in social distancing.

We measure mask use with a nationally-representative survey from early July. The data are based on roughly 250,000 interviews conducted by Dynata, a survey firm, at the request of The New York Times. The survey asked respondents about the frequency of mask use ranging from never to always. It provides a cross-county snapshot of mask use several months into the pandemic, at a time when the virus had reached most of the country and mask use itself remained a hot-button cultural issue.

We measure county-level policy responses across four NPIs: emergency declarations, stay-at-home orders, business closures, and mask mandates. The first three NPIs are recorded in the National Association of Counties (NACo) County Explorer dataset, which covers over 3,070 counties across the U.S. through April 15, 2020. Our analysis focuses on the cross-section of policy enactment as this is where the primary variation lies (i.e., most counties enacted policies around the same time in March). The mask mandates come from the dataset compiled by Wright et al. (2020) and cover the entire U.S. through August 4, 2020.

2.2 Estimating Equations

Our empirical strategy is twofold. First, we estimate event-study specifications to identify differential trends in social distancing across high- and low-TFE counties around the national pandemic declaration on March 13th. Second, we estimate cross-sectional specifications that relate TFE to mask use and county-level NPIs. We do not relate social distancing trends to the timing of state- or county-level NPIs out of concern for endogenous policy implementation. Indeed, our analysis of NPIs suggests that TFE is associated with county-level policies to fight the pandemic.

Our event-study analysis of social distancing is based on the following equation:

$$y_{ct} = \alpha + \sum_{j=min}^{max} \beta_j \text{TFE} \times \mathbf{1}(\text{time since March 13} = j) + \theta_c + \gamma_t + \varepsilon_{ct}, \tag{1}$$

where y_{ct} is a measure of social distancing in county c at time t, TFE captures total frontier experience (scaled in decades), $\mathbf{1}(\text{time since March 13} = \text{j})$ are indicators for the time until/after the national pandemic declaration on March 13th, θ_c is a county fixed effect, and γ_t is a time fixed effect. Our core specification defines time at the weekly frequency, but results are robust to other horizons. We consider two extensions of equation (1): (i) state×time fixed effects ($\theta_{s(c)t}$), and (ii) interactions of $\mathbf{1}(\text{time since March 13} = j)$ with other pre-determined correlates of social distancing, an important one being population density. Together with the baseline equation (1), these specifications address potential confounding by time-invariant unobservables as well as differential trends across high- and low-TFE counties. We also estimate a simpler difference-in-difference analogue of (1) to summarize the event-study results.

Our cross-sectional estimating equation is given by:

$$y_c = \alpha + \beta \text{TFE}_c + \mathbf{x}_c' \boldsymbol{\gamma} + \theta_s + \varepsilon_c, \tag{2}$$

where y_c captures mask use or county-level NPIs, $\mathbf{x}_c$ is a vector of predetermined county-level controls

used in Bazzi et al. (forthcoming),[4] and θ_s is a state fixed effect. We consider a number of extensions to equation (2), focusing on confounders explored in our prior work and new ones specific to the pandemic response. In all regressions, we cluster standard errors based on an arbitrary grid-cell approach that allows for correlated unobservables across all counties within 60 miles (Bester et al., 2011).[5]

3   Rugged Individualism and Collective Inaction

This section shows that frontier culture hindered collective action against COVID-19. Total frontier experience (TFE)—the duration of historical exposure to frontier conditions—has a negative association with social distancing, mask use, and local-government NPIs in response to COVID-19. This result is robust to many alternative explanations for the stark geographic differences in the public health response.

3.1   Social Distancing

Using the event-study specification (1), we find that high-TFE counties practiced considerably less social distancing after the national pandemic declaration on March 13. Figure 2 shows that around that date, TFE starts displaying positive effects on non-essential visits (panel a) and time spent at work (panel b). Panels (c) and (d) show similar patterns when we include state-by-week FE instead of simply week FE. The more demanding FE help account for variation in state-level policies at different points in time as well as differential regional evolution of public health risks (and thus of perceived needs for social distancing and other responses).

The dynamic path of point estimates in Figure 2 show a sharp break in mobility patterns immediately after the week of March 13. Each additional decade of TFE is associated with 2 percentage points (p.p.) higher likelihood of non-essential visits (panels a and c) and roughly 1.5 p.p. more time spent at work (panels b and d). This differential response materializes quickly after March 13 and is consistent with less social distancing in high-TFE counties. These are large effects given that the within-week, cross-county standard deviation in non-essential visits is 24 p.p. and in time at work is 6 p.p.

With data beginning 2–3 weeks before March 13, we see limited evidence of pre-trends. Panels (a) and (b) suggest that residents of low-TFE counties were not increasingly less mobile prior to public awareness about the severity of COVID-19 risk. This is consistent with the abruptness of the information shock in early March. With state-by-week FE in panels (c) and (d), we see some indication of a pre-trend, though the sharp jump in coefficients after the emergency declaration remains so large that it continues to suggest a strong break from the counterfactual trend.[6]

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[4]These include county area; county centroid latitude and longitude; distance to oceans, lakes and rivers from county centroid; mean county temperature and rainfall; elevation; and average potential agricultural yield.

[5]As in Bazzi et al. (forthcoming), inference is robust to clustering by state or by more flexible spatial structures.

[6]Given our objective in this analysis, the existence of pre-trends would not change our interpretation of the findings. Rather, it would suggest that residents of low-TFE counties began to engage in voluntary social distancing prior to (federal) government action to contain the virus. Any differential response prior to March 13 could be due to the same sort of mechanisms that triggered the differential response after March 13.

Figure 2: TFE and Social Distancing: Event-Study

Specification: County and Week FE

(a) Non-essential Visits

(Unacast)

(b) Time in Workplaces

(Google Community Mobility)

Specification: County and State-by-Week FE

(c) Non-essential Visits

(Unacast)

(d) Time in Workplaces

(Google Community Mobility)
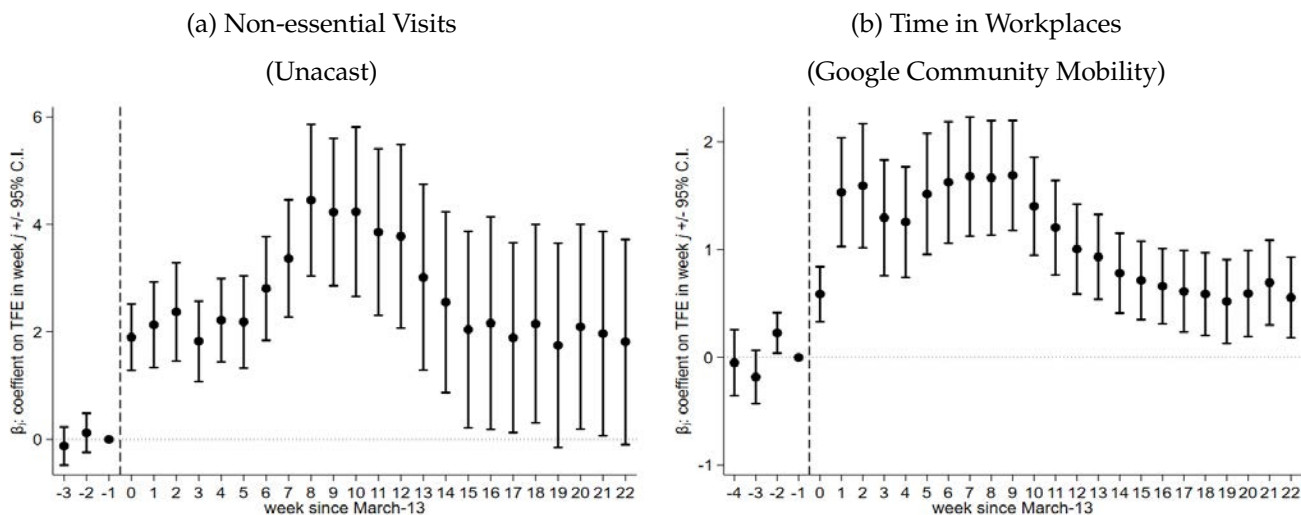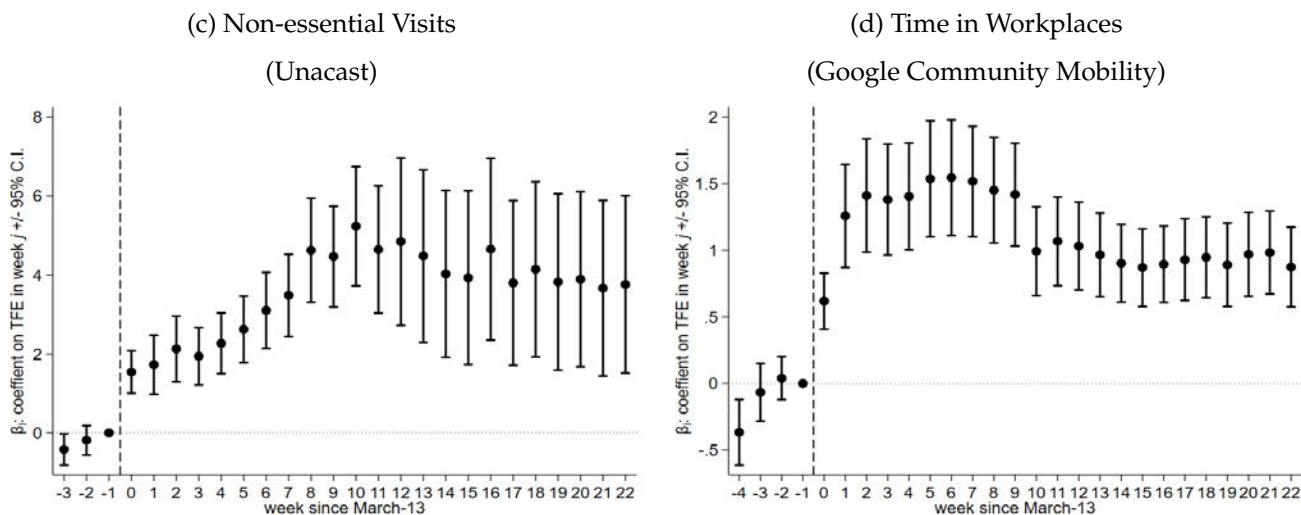
Notes: This figure reports estimates of the event-study specification in equation 1 with week and state-by-week fixed effects. All panels display point estimates by week and 95% confidence intervals corresponding to standard errors clustered by arbitrary 60-square-mile grid cells.

The gap in social distancing between high- and low-TFE counties becomes narrower over time in some specifications. Nearly two months after the national emergency declaration, TFE becomes significantly less correlated with social distancing in panels (a), (b) and (d). This partial convergence in behavior between high- and low-TFE places might reflect various forces, e.g., greater collective response in high-TFE places as they eventually converge in perceived health risks, or weaker collective response in low-TFE places as residents grow fatigued with protracted social distancing.

Ultimately, our event-study specification focuses on the event of the national emergency declaration as a salient information shock. In the subsequent months, there are many events with heterogeneous

regional patterns that affect risk perceptions and calls for collective action.[7] Our results in Figure 2 establish the sharp break in social distancing in high- versus low-TFE counties around the initial shock.

3.2 Mask Use

Besides less social distancing, high-TFE counties exhibit lower mask use. Those unwilling to voluntarily restrict activities outside the home may well be engaging in other preventative behaviors, and some may view mask use as one such substitute behavior. Although plausible, this hypothesis is rejected in Table 1. The estimates, based on the cross-sectional specification (2), suggest that greater TFE is associated with more residents reporting never, rarely, or sometimes using masks, and fewer residents reporting that they always wear a mask. Each additional decade of TFE is associated with roughly a 5–6 percent shift from regular mask use to never or rarely wearing one. These are sizable differences given that 17% of residents in the average county report never or rarely wearing a mask outside the home while 48% report always wearing a mask.

Table 1: TFE and Mask Use

	How often do you wear a mask in public when you expect to be within six feet of another person?				
	Never (1)	Rarely (2)	Sometimes (3)	Frequently (4)	Always (5)
total frontier experience	0.006***	0.004***	0.009***	-0.000	-0.019***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)
Number of Counties	2,036	2,036	2,036	2,036	2,036
Dep. Var. Mean	0.086	0.089	0.132	0.211	0.482
R^2	0.30	0.27	0.25	0.16	0.54
State Fixed Effects	✓	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓	✓

Notes: This table reports estimates of equation (2) for county-level means across a series of mutually exclusive responses to a question about mask use in early July 2020. The regressions control for state fixed effects and the following prede-termined controls: county area; county centroid latitude and longitude; distance to oceans, lakes and rivers from county centroid; mean county temperature and rainfall; elevation; and average potential agricultural yield. Standard errors are clustered by arbitrary 60-square-mile grid cells.
Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.

Combined with weaker social distancing, the lower mask use in high-TFE counties is consistent with individualistic opposition to collective action. Mask use, perhaps more than other risk-prevention behaviors, is seen as providing greater protection to others than to oneself. As such, the choice to wear a mask conveys concern for the well-being of those encountered in public space. The apparent greater lack of concern in high-TFE counties may stem from individualistic attitudes. It might also be due to weaker signals from local government about the importance of mask use or to distrust in the underlying science around efficacy in reducing risk.

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[7]When controlling for time-varying, county-level COVID-19 cases and deaths, the same general pattern from Figure 2 survives. These results in Appendix Figure A.2 suggest that the dynamic relationship between TFE and social distancing is not solely driven by confounding changes in the local prevalence of infection risk.

3.3 Local Policies

We now show that local governments in high-TFE counties are less likely to implement policies aimed to slow the spread of COVID-19. We examine the association of TFE and NPIs at the county level. Using equation (2), we estimate the effects of TFE on four types of interventions, the implementation of which varies widely across counties: emergency declarations (24% of sample counties by April 15, the end of the period covered by the NACo data), stay-at-home policies (5%), business closure policies (1%), and mask mandates (40% by early August).

Table 2 reports a negative association between TFE and each of these NPIs, strongly significant for all but the business closure interventions. With state fixed effects, these estimates isolate variation in county-level NPIs holding constant the state-level NPIs in place for those counties. While more than half of the variation in policies across counties is driven by variation across states, there are numerous counties that implement more aggressive NPIs than do their respective state governments, and still others that mandate less aggressive NPIs. The effects are sizable: each additional decade of TFE is associated with a decrease in the likelihood of NPIs on the order of 18% for emergency declarations (column 1), 50% for stay-at-home policies (column 2), and 9% for mask mandates (column 4).

Table 2: Local Policies

	Emergency Declaration (1)	Stay at Home (2)	Business Closure (3)	Mask Mandate (4)
total frontier experience	-0.042***	-0.025***	-0.003	-0.036***
	(0.011)	(0.007)	(0.003)	(0.008)
Number of Counties	2,036	2,036	2,036	2,035
Dep. Var. Mean	0.236	0.048	0.006	0.405
R^2	0.20	0.16	0.06	0.61
State Fixed Effects	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓

Notes: This table reports linear probability estimates of equation (2) for the incidence of four county-level NPIs listed at the top of each column. The regressions control for state fixed effects and the following predetermined controls: county area; county centroid latitude and longitude; distance to oceans,lakes and rivers from county centroid; mean county temperature and rainfall; elevation; and average potential agricultural yield. Standard errors are clustered by arbitrary 60-square-mile grid cells.
Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.

The results thus far suggest a strong link between frontier culture and the pandemic response. Residents of high-TFE counties are more likely to eschew social distancing and mask use, and their representatives are more likely to avoid public intervention aimed at changing individual behavior. These two sides of collective inaction are, of course, connected. Lack of distancing and mask-wearing may reflect weak or absent policies to nudge and coordinate such preventative behaviors. At the same time, the policy choices of local governments tend to reflect the preferences of their constituencies. While preferences and policies both shape behavior, we do not attempt to disentangle their relative importance in this paper.

3.4 Robustness Checks

We consider several alternative explanations for the relationship between TFE and the response to COVID-19. First, the results in Figure 2 cannot be fully explained by other county-specific determinants of COVID-19 risk and social distancing. We show this in Appendix Figure A.3 by separately interacting several county-level covariates with time-to-event, mirroring the interaction with county-level TFE. The potential confounders include population density, temperature, income, education, and racial composition, each of which has featured prominently in prior work exploring the pandemic risk and response (see, e.g., Ahmadi et al., 2020; Brown and Ravallion, 2020; Chiou and Tucker, 2020; Coven and Gupta, 2020; Sajadi et al., 2020). While some, like population density and temperature, remain the subject of debate about the precise risk mechanism, the mere perception of risk could shape prevention behavior. Some of these measures are themselves potential outcomes of TFE, which can make interpretation difficult. Nevertheless, the fact that the event-study results are robust to these additional controls suggests that they are unlikely to be important confounders. Appendix Table A.4 provides similar evidence of robustness using a simpler difference-in-difference specification with county FE that merely interacts TFE and the other covariates with an indicator for weeks after March 13.

The cross-sectional estimates for mask use and local policies are also generally robust to adding the same potential confounders as controls (see Appendix Tables A.2 and A.3). Together, these results suggest that TFE captures variation in the pandemic response that is not related to leading demographic and environmental factors associated with COVID-19 risk.

Disentangling Population Density. It is worth emphasizing that our findings cannot be explained by differences in population density across high- and low-TFE counties. Contemporary population density is strongly decreasing in TFE, and in some of the the robustness checks described above, a linear control for density reduced the effects of TFE on social distancing, mask use, and NPIs. Appendix Tables A.5 and A.6 show that the effects of TFE remain sizable with even more flexible controls for density. The matching-type exercise in column 4 is an extremely demanding specification: for each county, we find the county within the same state with the most similar population density and create matched pairs, define a dummy for each pair, and then add these as fixed effects (interacted with the post-March 13 indicator in the social distancing regressions). Columns 5 and 6 split the sample into counties above versus below the 90th percentile of population density, the former being urban areas. The effects of TFE generally survive across these specifications, which suggests that frontier culture and its implications for collective action cut across the density divide.

Regional Variation and the 20th Century Frontier. Appendix Tables A.7 and A.8 explore regional heterogeneity in the effects of TFE on social distancing, mask use, and NPIs. First, we add 105 West Coast frontier counties that were settled starting in the mid-19th century (column 1). We then split the sample by Census region: the Midwest (column 2), the South (column 3), and the West (column 4). The estimates are noisier for the latter given the smaller number of counties. In subsequent columns 5–8, we extend the frontier time-frame, thereby including counties that experienced frontier conditions beyond 1890. Overall, the findings remain largely unchanged across all these checks.

4   Frontier Culture and Proximate Causes of Inaction

This section explores why frontier culture undermined the pandemic response. We show that TFE underlies several leading explanations for opposition to social distancing, mask use, and NPIs.

In Table 3, we examine the association of TFE with civic culture, anti-statist partisanship, and trust in science. Each of these has been linked to variation in the public health response to COVID-19. We argue here that frontier culture underpins these findings. There are of course numerous other correlates of the individual and policy response to COVID-19. Our goal in this section is not to provide an exhaustive account of the role of TFE in understanding all of these associations documented in prior work. Rather, we aim to demonstrate that frontier culture may be a unifying explanation across a set of important factors underlying the public health response to the pandemic.

Many have argued that civic culture helped to promote voluntary social distancing. The strand of individualism cultivated on the American frontier tends to go against civic culture. Historically, frontier settlers had to rely on themselves for protection and prevention, and to improve their living conditions. While returns to cooperation may have been high, maintaining reciprocity would have been challenging given the high population mobility on the frontier. The "rugged" aspect of frontier culture, and the prevalence of violence in frontier societies, plausibly made this type of individualism particularly inimical to civic culture.

We explore the association of TFE with a common proxy measure of civic culture: voter turnout. Barrios et al. (2020) show that this measure is negatively correlated with social distancing. We share their interpretation: weaker civic culture implies lower disposition to internalize externalizes and take costly actions that contribute to the common good. Table 3 reveals a negative association between TFE and average voter turnout across the last five presidential elections (column 1).[8] Each additional decade of TFE is associated with nearly 0.5 p.p. lower turnout relative to a mean of 58% (std. dev. of 8.7%).

Residents of high-TFE counties not only display lower civic capital but also greater anti-statist partisanship, which can be an obstacle to public health during a pandemic. Bazzi et al. (forthcoming) show that high-TFE counties exhibit stronger and increasing support for the Republican Party between 2000 and 2016 (see column 2 of Table 3 below for the estimated effect of TFE in 2016). During this period, the Republican platform has increasingly aligned with the principles of rugged individualism. In Bazzi et al. (forthcoming), we showed that TFE is associated with opposition to tax redistribution, welfare spending, and other forms of government intervention, including the Affordable Care Act (ACA). Opposition to the ACA, a program for state-led provision of affordable health care, reflects, in part, opposition to seeing health as a right or as a public good. This ideology is likely to hamper the response to an infectious disease epidemic like COVID-19, which requires individuals and government to address externalities through collective action. Opposition to tax redistribution and welfare programs may also be an obstacle, since stay-at-home policies require support for individuals whose livelihoods are threatened.

The anti-statist element of rugged individualism and its partisan expression in the Republican Party may have limited the policy response to the pandemic while also undermining individual willingness to engage in costly collective action around social distancing and mask use. Others have shown that Republican voters are less likely to engage in social distancing (Barrios and Hochberg, 2020; Gadarian

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[8]The county-level voting outcomes in this section are based on data from Leip's Atlas of U.S. Presidential Elections.

et al., 2020; Painter and Qiu, 2020) and mask use (Milosh et al., 2020), and that Republican leaders are more likely to downplay the risks of COVID-19 (Allcott et al., 2020) and less likely to issue NPIs (Baccini and Brodeur, 2020). We argue that the frontier culture of rugged individualism lies at the heart of these partisan responses to the pandemic.

Another way in which frontier culture has shaped the pandemic response is through distrust in science and experts more generally. Frontier culture, insofar as it leads to opposition to all kinds of hierarchies, may be associated with distrust in science. Historically, the frontier was characterized by novel and uncertain conditions where traditions and rules of thumb acquired elsewhere were often ill-suited. This created an advantage for individualism, a trait that is associated with resourcefulness, non-conformism, and inventiveness (Raz, 2020; Shannon, 1977). While the context changed, there may be an enduring frontier cultural opposition toward established norms and hierarchies, including those based on science and education.

Table 3: Civic culture, anti-statist partisanship, and distrust in science

	Civic Capital (Avg. Turnout 2000-16) (1)	Republican Vote Share 2016 (2)	Don't Think Global Warming Is Happening (3)
total frontier experience	-0.438**	3.154***	0.919***
	(0.176)	(0.416)	(0.130)
Number of Counties	2,036	2,036	2,036
Dep. Var. Mean	57.865	65.420	21.751
R^2	0.53	0.32	0.35
State Fixed Effects	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓

Notes: This table reports estimates of equation (2) for the outcomes listed at the top of each column. The regressions control for state fixed effects and the following predetermined controls: county area; county centroid latitude and longitude; distance to oceans,lakes and rivers from county centroid; mean county temperature and rainfall; elevation; and average potential agricultural yield. Standard errors are clustered by arbitrary 60-square-mile grid cells.
Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.

To assess this possibility, we examine a salient topic on which distrust in science plays a key role: beliefs regarding climate change. Brzezinski et al. (2020) show that those who believe in the severity of global warming are more likely to engage in social distancing and to comply with government-mandated public health advisories. We show in Table 3 that frontier culture is associated with disbelief in climate change. Each additional decade of TFE is associated with a 1 p.p. increase in the share of residents that do not believe global warming is happening, according to survey data collected by the Yale Program on Climate Change Communication (Howe et al., 2015). This is a meaningful effect given that 22% of residents in the mean county hold such disbelief. This result suggests that distrust in science is one important way in which frontier culture undermines public health campaigns.

5 Conclusion

American rugged individualism—the combination of individualism and opposition to government intervention—has undermined collective action against the COVID-19 pandemic. We provide the first empirical evidence that frontier culture is central to understanding the weak public health response. Counties with longer historical frontier experience exhibit less mask use, less social distancing, and fewer NPIs. These counties also exhibit weaker civic capital, stronger anti-statist partisanship, and greater distrust in science, which are, among others, important proximate determinants of the country's weak public health response. We argue that America's frontier culture of rugged individualism is at the heart of its flawed response to the COVID-19 pandemic. An effective response requires strong collective action, the likes of which has eluded many areas of the country with a deep historical connection to the frontier.

The fragmented response to COVID-19 that we identify may have broader aggregate implications. As high- and low-TFE counties adopt different approaches to the pandemic, this makes it more difficult to blunt the spread of infection. Prevention success in one county will be offset and even undone as individuals come into contact with those from other counties with weaker responses. Ultimately, America's federal system of government—itself intertwined with the country's frontier history—makes it difficult to avoid such spillovers.

Individualistic responses to collective risk can pose grave public health consequences, especially in a context like the U.S. where institutions freely permit such a response. The U.S. legal system is predicated on the protection of individual liberties and decentralized governance. In his book, *The Pox of Liberty: How the Constitution Left Americans Rich, Free, and Prone to Infection*, Troesken (2015) describes how the institutional emphasis on individual liberties undermined America's historical response to smallpox by making vaccine (inoculation) avoidance possible. While America is considerably richer and its healthcare more advanced today, the institutional context is similar, and rugged individualism seems more entrenched than ever. Looking forward, it will be important to examine whether frontier culture hinders an effective COVID-19 immunization campaign if and when a vaccine becomes available.

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Appendix

Figure A.1: Total Frontier Experience (1790 to 1890)
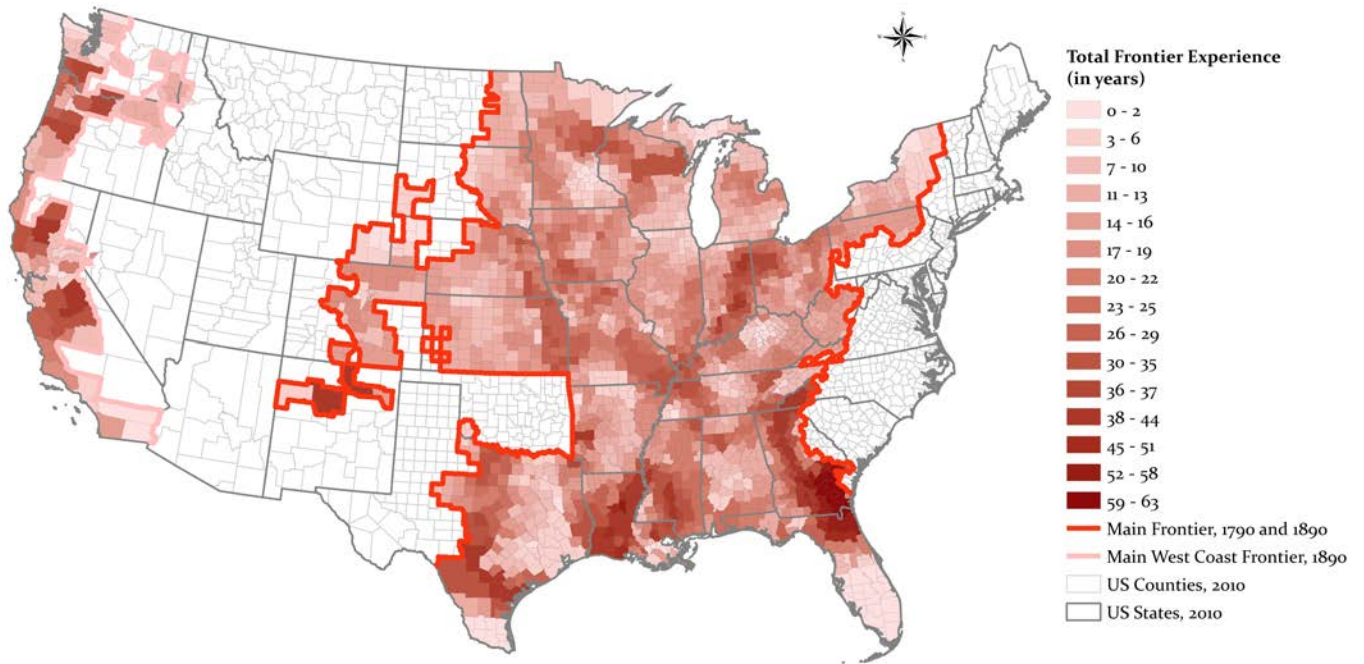
Notes: This figure is reproduced from Bazzi et al. (forthcoming). It is based on county-level data from NHGIS (Manson et al., 2019). Total frontier experience is the total number of years the county was within 100 km of the frontier line and its population density was below 6 people per square mile, between 1790–1890. The white areas to the east of the 1790 main frontier line are counties for which we do not know frontier history given the lack of Population Census data before 1790. The white areas to the west are beyond the 1890 frontier line.

Figure A.2: TFE and Social Distancing controlling for Lagged Per Capita Cases and Deaths

Specification: County and Week FE
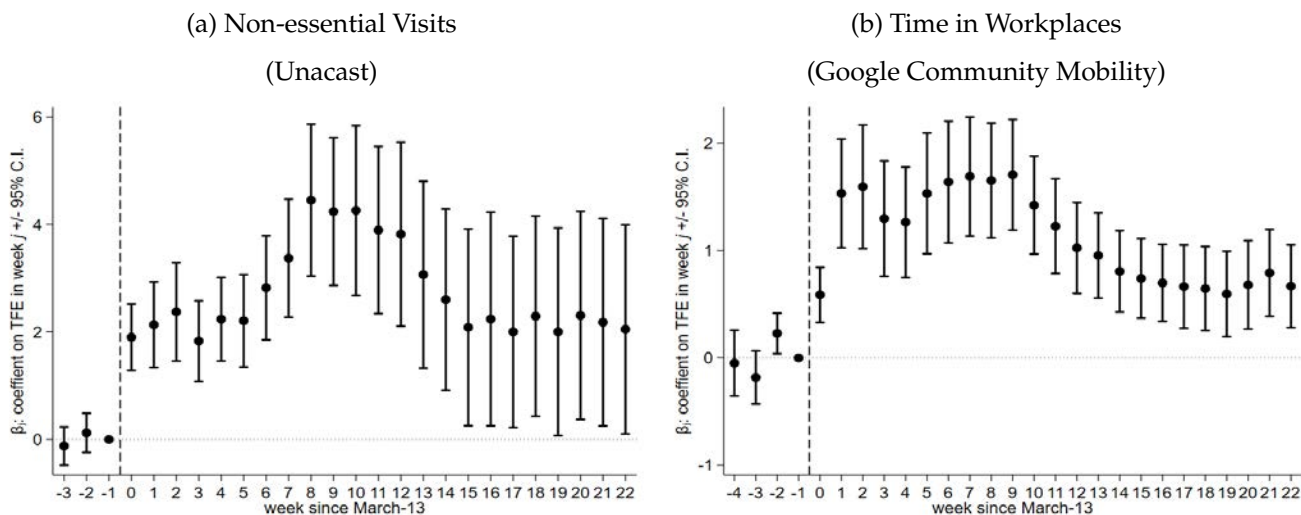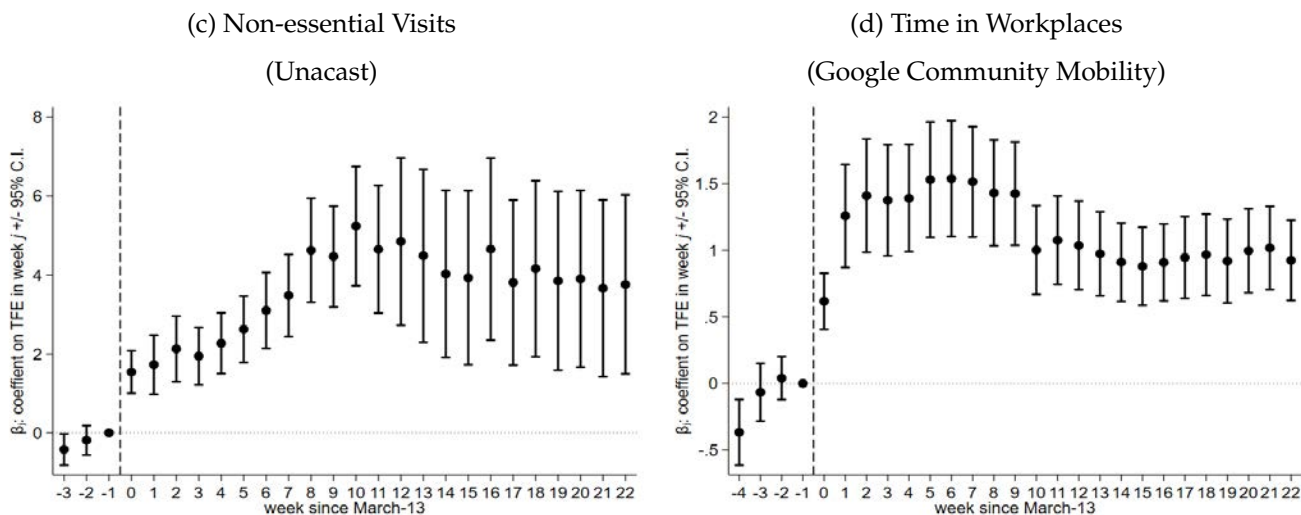
(a) Non-essential Visits

(Unacast)

(b) Time in Workplaces

(Google Community Mobility)

Specification: County and State-by-Week FE

(c) Non-essential Visits

(Unacast)

(d) Time in Workplaces

(Google Community Mobility)

Notes: This figure displays estimation results for our event-study specification in equation 1 for two different outcomes, with and without state-by-week fixed effects. All panels display point estimates by week and 95% confidence intervals corresponding to standard errors clustered by arbitrary 60-square-mile grid-cells.

Figure A.3: Robustness Check: TFE and Social Distancing

Specification: County and Week FE

(a) Non-essential Visits

(Unacast)
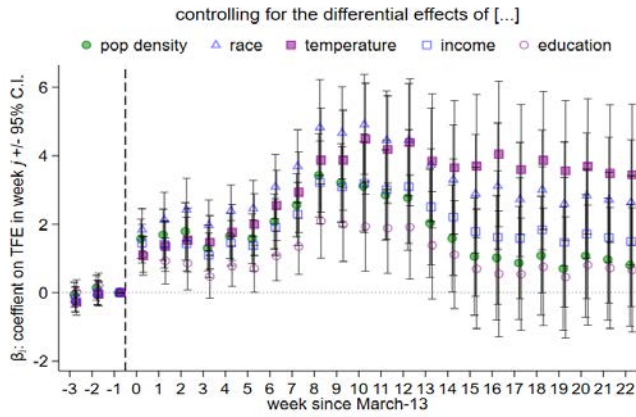
(b) Time in Workplaces

(Google Community Mobility)
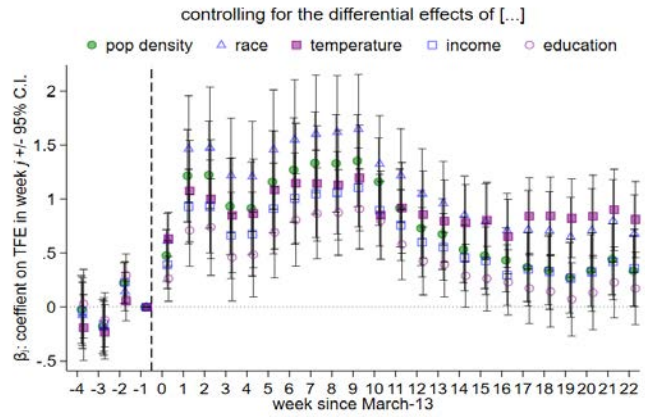
Specification: County and State-by-Week FE

(a) Non-essential Visits
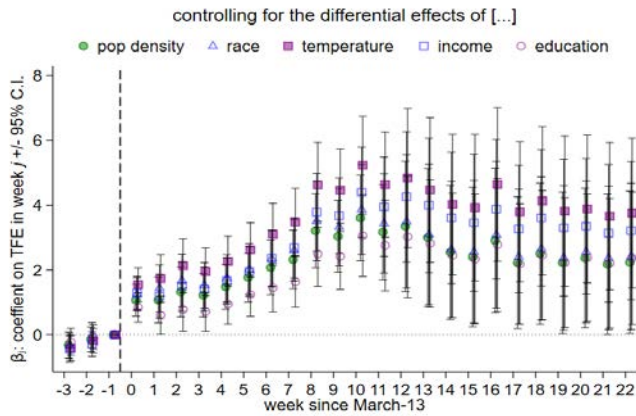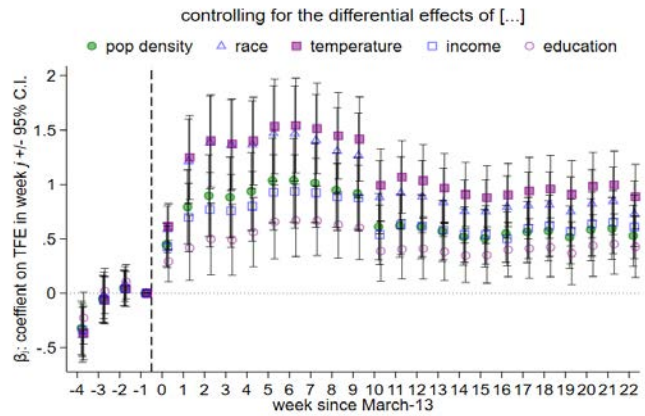
(Unacast)

(b) Time in Workplaces

(Google Community Mobility)

Notes: This figure displays estimation results for our event-study specification in equation 1 for two different outcomes and controlling for, separately, county level population density, race (share of white), mean temperature, median income or education (share with post-secondary educatiob) interacted with time-to-event dummies. The first panel icnludes county and week fixed effects while the second panel uses county and state-by-week fixed effects. All panels display point estimates by week and 95% confidence intervals corresponding to standard errors clustered by arbitrary 60-square-mile grid-cells.

Table A.1: Robustness Checks: TFE and Social Distancing

|	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(a) Non-essential Visits (Unacast)						
TFE × post-March-13	2.645***	1.746***	3.238***	3.255***	2.057***	1.003*	1.731***
	(0.619)	(0.529)	(0.579)	(0.645)	(0.593)	(0.531)	(0.544)
pop. density × post-March-13		-0.018***					-0.007***
		(0.002)					(0.001)
share white × post-March-13			0.483***				0.282***
			(0.054)				(0.058)
temperature × post-March-13				-0.685***			-0.469**
				(0.218)			(0.237)
median income × post-March-13					-0.000***		0.000***
					(0.000)		(0.000)
share post-sec. educ × post-March-13						-1.027***	-1.097***
						(0.061)	(0.106)
Number of County–Weeks	35,828	35,828	35,828	35,750	35,828	35,828	35,750
Dep. Var. Mean	-10.8	-10.8	-10.8	-10.8	-10.8	-10.8	-10.8
	(b) Time at Workplaces (Google Community Mobility)						
TFE × post-March-13	1.075***	0.787***	1.119***	0.996***	0.635***	0.413***	0.390***
	(0.192)	(0.151)	(0.191)	(0.189)	(0.131)	(0.129)	(0.121)
pop. density × post-March-13		-0.007***					-0.003***
		(0.001)					(0.001)
share white × post-March-13			0.028**				0.007
			(0.011)				(0.012)
temperature × post-March-13				0.070			-0.045
				(0.053)			(0.041)
median income × post-March-13					-0.000***		-0.000***
					(0.000)		(0.000)
share post-sec. educ × post-March-13						-0.420***	-0.306***
						(0.019)	(0.026)
Number of County–Weeks	49,938	49,938	49,938	49,857	49,938	49,938	49,857
Dep. Var. Mean	-22.4	-22.4	-22.4	-22.4	-22.4	-22.4	-22.4
County Fixed Effects	✓	✓	✓	✓	✓	✓	✓
Time Fixed Effects	✓	✓	✓	✓	✓	✓	✓

Notes: This table reports estimates of the simpler difference-in-difference analogue of specification in equation (1) for two different outcomes and accounting for potential confounders interacted with an indicator for post-March-13. Standard errors are clustered by arbitrary 60-square-mile grid cells.
Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.

Table A.2: Robustness Checks: TFE and Mask Use

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Share who always wear a mask in public when they expect to be within six feet of another person						
total frontier experience	-0.019***	-0.014***	-0.016***	-0.019***	-0.015***	-0.012***	-0.008***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
pop. density		0.000***					0.000***
		(0.000)					(0.000)
share white			-0.002***				-0.002***
			(0.000)				(0.000)
temperature				-0.001			-0.008
				(0.009)			(0.007)
median income					0.000***		0.000***
					(0.000)		(0.000)
share post-sec. educ						0.005***	0.002***
						(0.000)	(0.000)
Number of Counties	2,036	2,036	2,036	2,036	2,036	2,036	2,036
Dep. Var. Mean	0.482	0.482	0.482	0.482	0.482	0.482	0.482
R^2	0.54	0.58	0.56	0.54	0.58	0.60	0.63
State Fixed Effects	✓	✓	✓	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓	✓	✓	✓

Notes: This table reports estimates of equation (2) for the main mask use outcome while accounting for potential confounders at the county level. The regressions control for state fixed effects and the following additional predetermined controls: county area; county centroid latitude and longitude; distance to oceans,lakes and rivers from county centroid; mean county rainfall; elevation; and average potential agricultural yield. Standard errors are clustered by arbitrary 60-square-mile grid cells. Standard errors are clustered by arbitrary 60-square-mile grid cells.
Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.

Table A.3: Robustness Checks: TFE and Local Policies (I)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			(a) County Policies: Emergency Declarations				
total frontier experience	-0.042***	-0.025**	-0.035***	-0.042***	-0.030***	-0.023**	-0.013
	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)	(0.011)	(0.010)
pop. density		0.000***					0.000***
		(0.000)					(0.000)
share white			-0.003***				-0.002***
			(0.001)				(0.001)
temperature				-0.013			-0.032*
				(0.021)			(0.017)
median income					0.000***		0.000***
					(0.000)		(0.000)
share post-sec. educ						0.012***	0.005***
						(0.001)	(0.002)
Number of Counties	2,036	2,036	2,036	2,036	2,036	2,036	2,036
Dep. Var. Mean	0.236	0.236	0.236	0.236	0.236	0.236	0.236
R^2	0.20	0.24	0.20	0.20	0.23	0.24	0.27
State Fixed Effects	✓	✓	✓	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓	✓	✓	✓
			(b) County Policies: Stay at Home Policies				
total frontier experience	-0.025***	-0.014**	-0.021***	-0.025***	-0.019***	-0.014**	-0.009
	(0.007)	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)
pop. density		0.000***					0.000***
		(0.000)					(0.000)
share white			-0.002***				-0.001*
			(0.001)				(0.000)
temperature				0.024*			0.012
				(0.014)			(0.014)
median income					0.000***		0.000**
					(0.000)		(0.000)
share post-sec. educ						0.007***	0.003**
						(0.001)	(0.001)
Number of Counties	2,036	2,036	2,036	2,036	2,036	2,036	2,036
Dep. Var. Mean	0.048	0.048	0.048	0.048	0.048	0.048	0.048
R^2	0.16	0.23	0.16	0.16	0.19	0.21	0.25
State Fixed Effects	✓	✓	✓	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓	✓	✓	✓
			(c) County Policies: Business Closure Policies				
total frontier experience	-0.003	-0.001	-0.002	-0.003	-0.002	-0.002	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
pop. density		0.000					0.000
		(0.000)					(0.000)
share white			-0.000				-0.000
			(0.000)				(0.000)
temperature				0.001			-0.001
				(0.003)			(0.003)
median income					0.000		0.000
					(0.000)		(0.000)
share post-sec. educ						0.001*	0.000
						(0.000)	(0.000)
Number of Counties	2,036	2,036	2,036	2,036	2,036	2,036	2,036
Dep. Var. Mean	0.006	0.006	0.006	0.006	0.006	0.006	0.006
R^2	0.06	0.07	0.06	0.06	0.06	0.06	0.07
State Fixed Effects	✓	✓	✓	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓	✓	✓	✓

Notes: This table reports estimates of equation (2) for local policy outcomes while accounting for potential confounders at the county level. The regressions control for state fixed effects and the following additional predetermined controls: county area; county centroid latitude and longitude; distance to oceans,lakes and rivers from county centroid; mean county rainfall; elevation; and average potential agricultural yield. Standard errors are clustered by arbitrary 60-square-mile grid cells. Standard errors are clustered by arbitrary 60-square-mile grid cells.

Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.

Table A.4: Robustness Checks: TFE and Local Policies (II)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				(d) County Policies: Mask Mandates			
total frontier experience	-0.036***	-0.025***	-0.028***	-0.037***	-0.030***	-0.019**	-0.012
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
pop. density		0.000***					0.000
		(0.000)					(0.000)
share white			-0.004***				-0.003***
			(0.001)				(0.001)
temperature				-0.031			-0.043**
				(0.020)			(0.017)
median income					0.000***		-0.000
					(0.000)		(0.000)
share post-sec. educ						0.012***	0.011***
						(0.001)	(0.002)
Number of Counties	2,035	2,035	2,035	2,035	2,035	2,035	2,035
Dep. Var. Mean	0.405	0.405	0.405	0.405	0.405	0.405	0.405
R^2	0.61	0.63	0.62	0.61	0.62	0.64	0.65
State Fixed Effects	✓	✓	✓	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓	✓	✓	✓

Notes: This table reports estimates of equation (2) for local policy outcomes while accounting for potential confounders at the county level. The regressions control for state fixed effects and the following additional predetermined controls: county area; county centroid latitude and longitude; distance to oceans,lakes and rivers from county centroid; mean county rainfall; elevation; and average potential agricultural yield. Standard errors are clustered by arbitrary 60-square-mile grid cells. Standard errors are clustered by arbitrary 60-square-mile grid cells.
Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.

Table A.5: Disentangling Population Density: TFE, Social Distancing, and Mask Use

	(1)	(2)	(3)	(4)	(5)	(6)
Pop Dens x post-March-13		✓				
Pop Dens Decile Within-State x post-March-13 FE			✓			
Pop Dens Neighbor Matching Within-State x post-March-13 FE				✓		
Sample Restriction	None	None	None	None	> 90th percentile urban pop. share, 2010	≤ 90th

			Panel (a): Non-Essential Visits (Unacast)			
TFE × post-March-13	2.645***	1.746***	0.748	0.845*	1.191	1.681***
	(0.619)	(0.529)	(0.560)	(0.499)	(1.138)	(0.591)
Number of County–Weeks	35,828	35,828	35,542	35,750	3,588	32,240
R^2	0.70	0.70	0.70	0.73	0.69	0.69

			Panel (b): Time in Workplaces (Google Community Mobility)			
TFE × post-March-13	1.075***	0.787***	0.641***	0.558***	0.336	0.796***
	(0.192)	(0.151)	(0.147)	(0.111)	(0.440)	(0.153)
Number of County–Weeks	49,938	49,938	49,537	49,852	4,995	44,943
R^2	0.91	0.91	0.91	0.92	0.96	0.90

			Panel (c): Share who always wear a mask in public when they expect to be within six feet of another person			
total frontier experience	-0.019***	-0.014***	-0.012***	-0.010***	-0.012	-0.013***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.003)
Number of Counties	2,036	2,036	2,021	2,036	201	1,832
R^2	0.54	0.58	0.59	0.82	0.59	0.55
County Fixed Effects	✓	✓	✓	✓	✓	✓
Week Fixed Effects	✓	✓	✓	✓	✓	✓

Notes: This table disentangles the effects of TFE on social distancing outcomes from the effects of contemporary population density by controlling for the differential effects of population density in several ways. Column 1 reports the baseline estimates with county and week fixed effects. Column 2 adds an interaction of the 2010 population density with post-March 13 indicator. Column 3 includes fixed effect for the decile of within-state population density interacted with week indicators. Column 4 includes fixed effects indicators within-state pairs of counties that have the most similar population density in 2010 interacted with week indicators. Columns 5 and 6 split the sample into counties above and below the 90th percentile of contemporaneous urban population shares. Standard errors are clustered by arbitrary 60-square-mile grid cells. Column 4 and 5 additionally cluster (two-way) on the population density deciles and within-state county-pairs, respectively.

Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.

Table A.6: Disentangling Population Density: TFE and Local Policies

	(1)	(2)	(3)	(4)	(5)	(6)
Pop Dens x post-March-13		✓				
Pop Dens Decile Within-State x post-March-13 FE			✓			
Pop Dens Neighbor Matching Within-State x post-March-13 FE				✓		
Sample Restriction	None	None	None	None	$> 90th$ percentile urban pop. share, 2010	$\leq 90th$

(a): Emergency Declaration						
total frontier experience	-0.042***	-0.025**	-0.017	-0.022	0.025	-0.021*
	(0.011)	(0.011)	(0.011)	(0.014)	(0.035)	(0.012)
Number of Counties	2,036	2,036	2,021	2,036	201	1,832
R^2	0.20	0.24	0.25	0.63	0.27	0.20

(b): Stay at Home Policies						
total frontier experience	-0.025***	-0.014**	-0.012*	-0.012*	-0.051*	-0.009
	(0.007)	(0.006)	(0.006)	(0.007)	(0.029)	(0.006)
Number of Counties	2,036	2,036	2,021	2,036	201	1,832
R^2	0.16	0.23	0.25	0.69	0.48	0.13

(c): Business Closure Policies						
total frontier experience	-0.003	-0.001	-0.001	0.000	0.040	-0.003*
	(0.003)	(0.003)	(0.003)	(0.004)	(0.029)	(0.002)
Number of Counties	2,036	2,036	2,021	2,036	201	1,832
R^2	0.06	0.07	0.06	0.52	0.23	0.04

(d): Mask Mandates						
total frontier experience	-0.036***	-0.025***	-0.019**	-0.022**	-0.037	-0.018**
	(0.008)	(0.008)	(0.008)	(0.010)	(0.036)	(0.008)
Number of Counties	2,035	2,035	2,020	2,035	201	1,831
R^2	0.61	0.63	0.65	0.83	0.44	0.67
State Fixed Effects	✓	✓	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓	✓	✓

Notes: This table disentangles the effects of TFE on local policies from the effects of contemporary population density in several ways. Column 1 reports the baseline with state fixed effects and geographic and agroclimatic controls. Column 2 controls for contemporaneous population density. Column 3 includes fixed effects for the decile of within-state population density. Column 4 included fixed effects for the nearest-neighbor matching based on 2010 population density. Columns 5 and 6 split the sample into counties above and below the 90th percentile of contemporaneous urban population shares. The regressions control for state fixed effects and the following additional predetermined controls: county area; county centroid latitude and longitude; distance to oceans,lakes and rivers from county centroid; mean county rainfall; elevation; and average potential agricultural yield. Standard errors are clustered by arbitrary 60-square-mile grid cells. Standard errors are clustered by arbitrary 60-square-mile grid cells. Column 4 and 5 additionally cluster (two-way) on the population density deciles and within-state county-pairs, respectively.
Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.

Table A.7: Adding West Coast, Extended Time Frame, Regional Heterogeneity

TFE, Social Distancing, and Mask Use

Frontier Time Frame:	Baseline (1790–1890)				Extended (1790–1950)			
Regional Sample Restriction:	Baseline + West Coast (1)	Only Midwest (2)	Only South (3)	Only West (4)	Extended Sample (5)	Only Midwest (6)	Only South (7)	Only West (8)
	(a): Non-Essential Visits (Unacast)							
TFE × post-March-13	1.036**	3.338**	0.519	-1.959*	1.149***	4.581***	0.364	0.718
	(0.466)	(1.408)	(0.409)	(1.010)	(0.413)	(1.552)	(0.380)	(0.593)
Number of County–Weeks	38,168	15,106	18,460	3,120	42,926	15,340	20,410	5,694
R^2	0.04	0.01	0.03	0.07	0.03	0.02	0.03	0.08
	(b): Time in Workplaces (Google Community Mobility)							
TFE × post-March-13	-4.021***	-5.909***	-3.056***	-3.603***	-2.778***	-5.212***	-2.794***	-1.508***
	(0.239)	(0.339)	(0.265)	(0.665)	(0.212)	(0.423)	(0.208)	(0.218)
Number of County–Weeks	52,615	23,275	23,884	3,757	59,965	23,681	26,696	7,889
R^2	0.15	0.19	0.12	0.09	0.12	0.17	0.12	0.10
	(c): Share who always wear a mask in public when they expect to be within six feet of another person							
total frontier experience	-0.019***	-0.031***	-0.018***	-0.002	-0.012***	-0.016***	-0.015***	-0.005*
	(0.003)	(0.006)	(0.004)	(0.009)	(0.002)	(0.006)	(0.003)	(0.003)
Number of Counties	2,141	987	936	152	2,499	1,037	1,074	322
R^2	0.58	0.40	0.44	0.55	0.59	0.42	0.46	0.72
County or State Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Week FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Focusing on the key social distancing outcomes, this table extends our baseline sample of counties and examines region-by-region sample splits. Column 1 adds counties along the secondary West Coast frontier. Column 2 restricts to counties in the Midwest Census region, column 3 restricts to the South region, and column 4 restricts to the West, which includes the counties added in column 1 plus others in states in the West region but falling inside the 1890 main east-to-west frontier line. Column 5 expands the column 1 sample to include counties beyond the (main and secondary) 1890 frontier lines but inside the eventual frontier line realized by 1950. Columns 6–8 then proceed with the same region-by-region sample splits. Standard errors are clustered by arbitrary 60-square-mile grid cells.
Significance levels: ∗ : 10% ∗∗ : 5% ∗∗∗ : 1%.

Table A.8: Adding West Coast, Extended Time Frame, Regional Heterogeneity

TFE and Local Policies

Frontier Time Frame:	Baseline (1790–1890)				Extended (1790–1950)			
Regional Sample Restriction:	Baseline + West Coast (1)	Only Midwest (2)	Only South (3)	Only West (4)	Extended Sample (5)	Only Midwest (6)	Only South (7)	Only West (8)
				(a): Emergency Declaration				
total frontier experience	-0.039***	-0.060***	-0.039***	0.023	-0.020***	-0.041***	-0.027***	-0.004
	(0.011)	(0.018)	(0.015)	(0.026)	(0.007)	(0.014)	(0.010)	(0.010)
Number of Counties	2,141	987	936	152	2,500	1,038	1,074	322
R^2	0.26	0.10	0.19	0.45	0.28	0.09	0.19	0.42
				(b): Stay at Home Policies				
total frontier experience	-0.027***	-0.013	-0.027***	-0.034	-0.021***	-0.005	-0.029***	-0.018***
	(0.007)	(0.010)	(0.008)	(0.023)	(0.004)	(0.009)	(0.006)	(0.005)
Number of Counties	2,141	987	936	152	2,500	1,038	1,074	322
R^2	0.24	0.12	0.16	0.50	0.22	0.12	0.16	0.40
				(c): Business Closure Policies				
total frontier experience	-0.002	-0.002	-0.002	0.012	-0.004**	-0.001	-0.003	-0.004
	(0.003)	(0.002)	(0.004)	(0.011)	(0.002)	(0.002)	(0.003)	(0.003)
Number of Counties	2,141	987	936	152	2,500	1,038	1,074	322
R^2	0.09	0.02	0.08	0.35	0.11	0.02	0.07	0.22
				(d): Mask Mandates				
total frontier experience	-0.004***	-0.000	-0.002**	-0.008	-0.003	-0.000	-0.003**	0.000
	(0.001)	(0.004)	(0.001)	(0.011)	(0.002)	(0.004)	(0.001)	(0.003)
Number of Counties	1,307	349	771	136	1,494	351	827	265
R^2	0.10	0.03	0.05	0.44	0.09	0.03	0.05	0.25
State Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Geographic/Agroclimatic Controls	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Focusing on the local policy outcomes, this table extends our baseline sample of counties and examines region-by-region sample splits. Column 1 adds counties along the secondary West Coast frontier. Column 2 restricts to counties in the Midwest Census region, column 3 restricts to the South region, and column 4 restricts to the West, which includes the counties added in column 1 plus others in states in the West region but falling inside the 1890 main east-to-west frontier line. Column 5 expands the column 1 sample to include counties beyond the (main and secondary) 1890 frontier lines but inside the eventual frontier line realized by 1950. Columns 6–8 then proceed with the same region-by-region sample splits. The regressions control for state fixed effects and the following additional predetermined controls: county area; county centroid latitude and longitude; distance to oceans,lakes and rivers from county centroid; mean county rainfall; elevation; and average potential agricultural yield. Standard errors are clustered by arbitrary 60-square-mile grid cells. Standard errors are clustered by arbitrary 60-square-mile grid cells.
Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$.