Frontier Culture: Historical Roots and Persistence of “Rugged Individualism” in the United States

Samuel Bazzi†
Boston University,
CEPR and BREAD

Martin Fiszbein†
Boston University
and NBER

Mesay Gebresilasse§
Boston University

July 2017

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Abstract

In a classic 1893 essay, Frederick Jackson Turner argued that the American frontier promoted individualism. In this paper, we restate the Frontier thesis and examine its relevance at the subnational level. Using Census data and GIS techniques, we track the frontier throughout the 1790–1890 period and construct a novel, county-level measure of historical frontier experience. We document the sharp demographic differences of frontier locations—high sex ratios, high shares of prime-age adults, high fertility rates, high shares of foreigners, low literacy rates—as well as their higher levels of individualism, proxied by the share of unique names among children. Higher individualism is not driven entirely by selective migration, suggesting that frontier conditions may have shaped behavior, for example, by means of an evolutionary advantage of self-reliance. We offer empirical evidence on this mechanism and consider other potential channels for cultural persistence. We then show that counties with longer frontier experience exhibit greater individualism in the mid-20th century and higher opposition to redistribution and regulation today. The results are robust to accounting for a number of potential confounders as well as an instrumental variable strategy that exploits variation in immigration flows over time.

Keywords: Culture, Individualism, Preferences for Redistribution, American Frontier, Persistence

JEL Codes: D72, H2, J11, N31, N91, P16, R11

*We thank Camilo Garcia-Jimeno, Ray Fisman, Oded Galor, Paola Giuliano, Bob Margo, Nathan Nunn, Ömer Özak, Daniele Paserman, and David Weil, as well as seminar participants at ASREC, Boston University, and Brown for helpful comments. Yeonha Jung, Max McDevitt, and Huiren Tan provided excellent research assistance. All errors are our own.

†Department of Economics. 270 Bay State Rd., Boston, MA 02215. Email: sbazzi@bu.edu.
‡Department of Economics. 270 Bay State Rd., Boston, MA 02215. Email: fiszbein@bu.edu.
§Department of Economics. 270 Bay State Rd., Boston, MA 02215. Email: mmelese@bu.edu.
By adherence to the principles of decentralization, self-government, ordered liberty, and opportunity and freedom to the individual our American experiment has yielded a degree of well-being unparalleled in all the world. . . . There is a still further road to progress which is consonant with our American system—a method that reinforces our individualism by reducing, not increasing, government interference in business.”

—Herbert Hoover (“Rugged Individualism,” 1928)

RUGGED INDIVIDUALISM: the practice or advocacy of individualism in social and economic relations emphasizing personal liberty and independence, self-reliance, resourcefulness, self-direction of the individual, and free competition in enterprise.”

—Merriam-Webster Dictionary

1 Introduction

Until the late 19th century, the United States underwent an extensive process of westward settlement. Vast tracts of open land characterized its territory. According to the influential historian Frederick Jackson Turner, the presence of a frontier line dividing settled and unsettled locations strongly influenced American culture, fostering the development of unique features. Salient among these was individualism, associated with a strong inclination toward self-reliance and a preference for low levels of government intervention.

This paper examines the contemporaneous and long-run effects of the American frontier on culture. First, we show that locations inside the frontier exhibit relatively higher individualism that cannot be entirely explained by selective migration. Evidence suggests that individualism was associated with differential success and survival in the frontier. This individualist advantage enabled an intergenerational mechanism for cultural persistence. We show that locations exposed to the frontier for a longer period historically exhibit higher contemporary levels of individualism, lower support for redistribution, and stronger opposition to government regulation. These findings offer systematic empirical support for a defining and controversial thesis on American history. More importantly, the results shed new light on the persistence of frontier culture and its lasting political legacy across the United States.

In the conceptual framework that we propose—based on the classic work of Turner as well as on insights from social psychology and economics—the significance of the frontier resulted from the combination of three factors. First, frontier locations attracted people with distinctive characteristics, both in terms of demographics and individualism. Second, the frontier experience, characterized by isolation and wilderness, fostered the development of self-reliance and related cultural traits known to have a strong relationship with preferences for redistribution and views on the role of government. Finally, the distinctive features of frontier populations affected preferences and social norms at a formative stage, leaving an imprint on local culture.

We determine the position of the frontier and track its evolution over time using population data from the Census and applying Geographic Information System (GIS) techniques. Drawing upon Turner’s classic essay and the 1890 Census report, Progress of the Nation (Porter et al., 1890), we identify the frontier
line as the line at which population density dropped below two people per square mile. We identify frontier locations at each point in time and define a measure of total frontier experience as the time spent in the frontier during the 1790-1890 period. This provides a precise and comprehensive measurement of the history of the American frontier, and to our knowledge, the first measure of historical intensity of frontier exposure.

We provide rigorous new evidence on the demographic and cultural distinctiveness of frontier locations consistent with historical narratives. High sex ratios, high shares of prime-age adults, high fertility rates, low literacy rates, and high shares of foreign-born characterized the frontier. Using semiparametric regressions, we identify sharp breaks in these demographics patterns close to the population density cutoff defining the frontier line in historical accounts. Moreover, event study specifications show how these traits evolve as counties transition out of the frontier and communities grow more permanent roots.

These methods reveal similarly sharp patterns of greater individualism inside the frontier as reflected in the prevalence of unique first names for children. This finding holds across various measures of uniqueness and restrictions to native-born (grand)parentage. A core aspect of cultural transmission, name choices not only reflect parental preferences but also shape children’s notions of self-identity with implications for subsequent behavior. A small but growing literature originating in psychology links unique names to other contemporary proxies for individualism as well as social and economic decisions associated with greater self-reliance and less cooperation (see, e.g., Beck Knudsen, 2017; Laham et al., 2012; Twenge et al., 2010; Zurn and Topolinski, 2017).

In order to understand the roots of frontier culture, we need to know why individualism came to thrive in frontier locations. We provide insights using data from a linked sample of households across the 1870 and 1880 Census that allows us to track people across locations. First, we show that selective migration of individualist parents cannot fully explain differential naming patterns inside and outside of the frontier. This suggests that environmental factors in the frontier may have fostered individualism. One potential mechanism is the presence of an evolutionary advantage of individualism in conditions in which people had to rely on themselves for protection and to improve their well-being. We provide suggestive evidence of relatively high returns to individualism in the frontier. Males with unique names, and those that chose unique names for their children, exhibit relatively higher socioeconomic status—both in levels and changes—inside than outside the frontier. Moreover, families with unique names are less likely to leave the frontier for more settled counties to the east during this period. Differential success and persistence of individualism may have influenced the process of cultural transmission across generations, creating a link between initial conditions and modern political preferences.

We investigate these long-run effects of frontier exposure on culture using our new measure of total frontier experience (TFE). First, we show that TFE correlates with unique naming patterns several generations after the closing of the frontier. Second, we use a range of survey and voting data to identify significant differences in preferences and policy outcomes across counties with different TFE. These differences are robust to different spatial fixed effects as well as a host of geographic and agroclimatic features that are correlated with TFE and modern culture, including area, latitude and longitude, rainfall and temperature, distance to waterways and the coast, and potential agricultural productivity.

We find a robust association of TFE with opposition to redistribution and high levels of government spending. These results hold across three widely used contemporary data sources—the General Social
Survey (GSS), the American National Election Survey (ANES), and the Cooperative Congressional Election Study (CCES)—capturing slightly different notions of redistribution and public expenditures. As a benchmark, the GSS-based estimates suggest that each additional decade of TFE is associated with a reduction in support of redistribution on par with the gap in support for redistribution between younger and older individuals 10 years apart. Beyond stated preferences, actual property taxes in 2010 are significantly lower in counties with greater TFE.

We further link TFE to growing support for the Republican Party. Each decade of TFE is associated with 3.5 percent more votes for Republican candidates in presidential elections since 2000. This effect ratchets up over the 2000s with each election exhibiting a significantly larger effect of TFE, and the 2016 election exhibiting a particularly large frontier legacy.\(^1\)

We provide deeper insights into why Republican party support is stronger in areas with higher TFE by identifying a set of contentious policy issues that are at the core of frontier norms and values described in the historical literature. Using the CCES, we show that locations with higher TFE are more likely to support repeal of the Affordable Care Act, less likely to support an increase in the minimum wage, less likely to support a ban on assault rifles, and more likely to oppose government regulation of CO\(_2\) emissions. These effects survive even after accounting for the strength of partisan and class cleavages. Each of these issues bears a particular link to salient notions in the frontier: opposition to state intervention, strong belief in effort versus luck in reward, necessity of self-defense, and notions of “manifest destiny.”

We take three steps to argue for a causal interpretation of these long-run effects. First, we show that the results survive a progressively richer set of controls aimed at removing important confounders of frontier experience, individualism and preferences for redistribution. These include, among others, population density, diversity, and historical exposure to large-scale public investment such as the railroad. Second, we rule out additional concerns about omitted variables by using the Oster (forthcoming) approach to show that the degree of selection-on-unobservables is relatively limited. Finally, we show that most effects survive an instrumental variables (IV) strategy that isolates plausibly exogenous shifts in the speed of westward expansion through a given location. From the perspective of a given county in the sparsely populated interior, the instrument exploits the coincidental timing of immigration flows to the (coastal) United States and westward movements of the frontier through counties far to the east.\(^2\)

This paper contributes to a growing economic literature on culture, focusing on preferences for redistribution and individualism. Considerable attention has been paid to preferences for redistribution. Less has been paid to individualism, despite its prominence in the influential work of Greif (1994).\(^3\) While

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\(^1\)As discussed in Section 6.4, the magnitude of this legacy compares favorably to other leading, more proximate explanations for the Republican shift in the American heartland, such as import competition from China.

\(^2\)Conceptually, our strategy can be viewed as a combination of Bartik (1991) and spatial lag approaches to identification, avoiding concerns about validity due to reverse causality associated with the latter (see Gibbons and Overman, 2012).

\(^3\)An important exception is a series of recent papers by Gorodnichenko and Roland (2011, 2015, 2016), discussed further in Section 2.1. This cross-country analysis argues that individualism fosters economic growth and democratization. Empirically, they rely on a well-established link between pathogen prevalence (i.e., communicable diseases) and the strength of collectivist norms. While this correlation has been found across broad regions of the United States as well (Varnum, 2014), our empirical strategy isolates local variation in the drivers of individualism that is not driven solely by this mechanism. Nevertheless, our findings complement this other work as frontier conditions share many of the same features of ecological and biological stress underlying the pathogen prevalence mechanism. Indeed, we are open to the possibility that part of the way in which the frontier shapes behavior could be through this biology-based, parasite-stress theory of sociability due to Fincher and Thornhill (2012). What is unique here is how these environmental factors interact with the frontier settlement process at a critical juncture of political history.
there is extensive work exploring cross-country differences in preferences for redistribution (see Alesina and Giuliano, 2011, for a survey), we are the first to study the role of the American frontier in shaping these preferences, thereby offering support to the conjecture in Alesina et al. (2001) that the frontier helps explain the roots of opposition redistribution in the U.S. today.\footnote{In particular, they note on p. 222 that “The open frontier in a country of immigrants strengthened individualistic feelings and beliefs in equality of opportunities rather than equality of outcomes.} To our knowledge, García-Jimeno and Robinson (2011) is the only other paper that empirically examines the Frontier thesis in economics, assessing the correlation between the size of the frontier and the prevalence of democratic institutions at the country level in the Americas.\footnote{They find a positive and significant correlation between the percentage of land in the frontier in 1850 and an indicator of democratic quality between 1900 and 2007. They also go beyond the simple Frontier thesis to a conditional one in which the effects of the frontier depend on the quality of initial institutions.} Our study identifies the long-run effects of the American frontier on contemporary preferences and policy outcomes by exploiting subnational variation, using a wealth of data and introducing a novel measure of frontier exposure.

Our results show that individualism and opposition to redistribution survive long after the transition from frontier conditions to established settlement, adding new evidence to a growing literature on the deep roots and striking persistence of culture (e.g., Alesina et al., 2013; Fernández, 2011; Guiso et al., 2016; Nunn and Wantchekon, 2011; Spolaore and Wacziarg, 2013). Giuliano and Nunn (2017) show how agroclimatic factors shape incentives to maintain culture and traditions across generations. While frontier culture may arise out of particular environmental conditions, its persistence is due in part to the critical juncture of U.S. history in which that culture flourished across the American heartland. Although not explicit, this notion of persistence was arguably at the heart of Turner’s original thesis.

Moreover, we add to a very rich literature outside economics that elaborates on Turner’s celebrated work. While many studies in history and sociology attempt to document the demographic traits characterizing the frontier, we offer a more comprehensive and systematic approach to measurement. By identifying sharp structural breaks in these traits at around the seemingly arbitrary population density cutoffs put forward by Turner and his contemporaries, we find renewed support for classic notions of what made the frontier so distinctive.

Our analysis of the long-run effects of frontier experience as the outcome of intergenerational transmission of individualism also makes a contribution beyond economics. In the social psychology literature, Vandello and Cohen (1999) and Varnum and Kitayama (2011) document empirical patterns that suggest persistent effects of the American frontier on culture. Using contemporary state-level data, they show that the Western United States exhibit higher levels of individualism. Varnum and Kitayama (2011) use the share of uncommon names to capture a state’s degree of individualism, and explicitly motivate their study as a test of the Frontier thesis (previously discussed at length in Kitayama et al., 2010). We go beyond the broad geographic correlations in these studies by measuring the frontier more precisely, by providing empirical evidence on the underlying mechanisms for persistence, and by linking individualism to actual policy outcomes.

Overall, our findings may offer new perspective on the process by which American culture and politics became imbued with high levels of individualism and opposition to redistribution. We cannot directly address the roots of cultural traits in the U.S. as a whole and hence refrain from offering any direct explanation in regards to cross-country cultural variation. However, our findings may help explain
the persistent differences in political views across regions of the U.S. From a policy perspective, the cultural persistence that we identify may be helpful in understanding a salient puzzle in American political economy, namely that preferences for redistribution have remained extremely stable despite significant increases in inequality over the last 40 years (see Ashok et al., 2015).

The paper is organized as follows. Section 2 provides a general discussion of individualism and opposition to redistribution as well as economic theories about their origins and consequences. We also link these theories to the Frontier thesis and offer a simple conceptual framework to understand its significance. Section 3 explains how we measure frontier exposure historically and over the long run. Section 4 documents the distinctive features of frontier populations. Section 5 offers evidence for why the frontier may have favored individualism while sustaining its persistence across generations. Section 6 then provides estimates of the long-run effects of frontier experience on culture. Section 7 concludes.

2 The Frontier Thesis and Modern Political Economy

This section provides a conceptual background for our analysis by situating Turner’s ideas about the American Frontier within the growing economics literature on culture. We start by discussing some contributions in this literature that are key for our purposes. Then, we restate the Frontier thesis, breaking it down into the potential channels for initial influence and subsequent persistence.

2.1 Individualism and Preferences for Redistribution

The role of culture has generated increasing interest among economists. Following Guiso et al. (2006), culture is often defined as “those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation.” A growing number of contributions study the roots and consequences of various cultural traits, including trust, thrift, preferences for redistribution, the strength of family ties, long-term orientation, and attitudes toward fertility and female labor market participation (Alesina and Giuliano, 2011; Alesina et al., 2013, 2014; Figlio et al., 2016; Fernández, 2011; Galor and Özk, 2016; Luttmer and Singhal, 2011; Tabellini, 2010). This paper focuses on individualism and opposition to government intervention, which were salient in the context of the American Frontier.

Individualism has attracted relatively more attention in the social and cultural psychology literature. This literature—a prime source of data and ideas for studies of culture in economics—often portrays individualism as the most important dimension of cross-country variation in culture (e.g., Heine, 2010; Triandis, 1995). The influential work of Hofstede (1980) emphasizes individualism as a concern for oneself and immediate family, an emphasis on personal autonomy and self-fulfillment, and the foundation of identity on personal accomplishments (see also Hofstede, 1991). Individualism is most often defined in contrast with collectivism. Triandis (1988, 1995, 2001) makes the distinction in terms of four major attributes: in individualism, the self is independent rather than interdependent, there is primacy of personal goals rather than group goals, behavior is regulated primarily by personal attitudes rather than social norms, and market exchange is more important than communal relationships.6

6The classical works of Durkheim (1893), Tönnies (1887), Weber (1905) and Parsons and Shils (1951) had anticipated some aspects of the individualist–collectivist distinction.
Individualism is best characterized as a set of interconnected traits and hence is less straightforward to define than other cultural dimensions. Perhaps because of this, the individualist–collectivist dimension of culture has received relatively little attention from economists. There are, however, a few important exceptions. Greif (1994) introduces the individualist–collectivist dimension in his influential contribution on the role of culture in shaping institutional structures governing trade in the Middle Ages. More recently, Gorodnichenko and Roland (2011, 2015) show that individualistic countries have more democratic institutions and higher long-run growth. Gorodnichenko and Roland (2016) build an endogenous growth model in which individualism creates incentives to stand out and innovate.

Individualism is closely associated with opposition to redistribution, a cultural trait that has attracted considerable attention in economics. Paul Samuelson once noted that “to an economist the word ‘individualism’ is tied up with laissez faire” (Samuelson, 1965). In fact, Alesina and Giuliano (2011) measure preferences for redistribution using the same question from the General Social Survey that Di Tella et al. (2008) use to measure individualism. Intuitively, the defining characteristics of individualism (e.g., the inclination toward self-reliance, the concern for oneself and immediate family) can be associated with an opposition to redistribution. The connection is explicit in the ideology—often associated with U.S. Republican president Herbert Hoover—of “rugged individualism,” which promotes self-reliance and opposes state intervention through taxes or regulations. In the sociology literature, Celinska (2007) notes that an aspect of “utilitarian individualism and the consequence of a strong belief in self-reliance” is the “opposition toward governmental efforts to equalize citizens’ economic position, to limit private business, and to build strong social programs that provide assistance to the most disadvantaged.”

Economists have advanced explanations for variation in preferences for redistribution that are relevant for understanding the roots and persistence of cultural traits characterizing the American Frontier. In a seminal paper, Piketty (1995) analyzes how preferences for tax redistribution are shaped by beliefs about the importance of effort versus luck in the income generating process, and how these beliefs are determined by history. The higher the perceived importance of effort, the higher the expected negative effects of taxes due to adverse incentives, and thus the lower the desired tax rate. Alesina and Angeletos (2005) show that a belief in the importance of fairness—a conviction that income should be determined by effort rather than luck—is highly correlated with social welfare spending as a share of GDP across countries. In a model of tax redistribution, preferences for fairness generate multiple equilibria, one with high redistribution and the other with low. The multiplicity of equilibria in models like this may help shed light on the persistent nature of cultural traits, as discussed further in the next section.

Benabou and Ok (2001) highlight the role of expectations about future income, examining how the prospects of upward mobility may lead to lower preferences for tax redistribution. Even people with below-average income, who would appear to benefit from redistribution, may oppose it insofar as they expect to move up in the income distribution. Benabou and Ok show that it is possible to have a majority

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7In general, individualism and preferences for redistribution are not necessarily associated in this way. For instance, across countries, the correlation between Hofstede’s measure of individualism and a measure of preferences for redistribution from the World Values Survey goes in the opposite direction. Yet, controlling for country fixed effects, or with data solely from within the United States based on the American National Election Survey, there is a negative association between self-reliance and support for redistribution.

8The role of fairness considerations and the perceived importance of effort versus luck in income generation emphasized in this framework also sheds light on how perceptions about poverty—in particular, whether poor people are poor due to lack of effort or luck—influence the desired levels of redistribution.
of rational expectations agents voting against redistribution. In an empirical study using data from the U.S., Alesina and La Ferrara (2005) find that individuals with greater expected income growth are more likely to oppose redistribution, suggesting that high income mobility in the U.S. might explain its relatively low level of redistribution.

These theories explain how preferences for redistribution are affected by expectations about future income and the perceived role of luck versus effort in income generation. The insights also apply more broadly to preferences about the size and scope of government. While we focus on redistribution in line with much of the prior literature, we also investigate other outcomes related to government intervention, spending, and regulation more broadly. These outcomes reflect core policy differences between the United States and Europe that have motivated substantial research in political economy. As noted earlier, Alesina et al. (2001) alludes to a possible role of the frontier. In the next section, we provide further background on this potential connection, laying the groundwork for our empirical analysis that follows.

2.2 The Frontier Thesis: A Restatement

Throughout the 19th century, the United States underwent a process of rapid westward expansion. According to the influential historian Frederick Jackson Turner, the presence of vast tracts of open land throughout a formative period of U.S. history had a strong influence on American society. In his words: “The existence of an area of free land, its continuous recession, and the advance of American settlement westward, explain American Development” (Turner, 1920). More precisely, Turner’s thesis suggests that the presence of the frontier, “the meeting point between savagery and civilization,” was conducive to the formation of individualistic and democratic cultural traits: “These free lands promoted individualism, economic equality, freedom to rise, democracy” (Turner, 1920).

This paper can be viewed as a restatement of Turner’s thesis at the subnational level. We argue that the significance of the frontier resulted from the combination of three factors. First, frontier locations attracted people with distinctive characteristics, both in terms of demographics and the prevalence of individualism. Second, the frontier experience, characterized by isolation and wilderness, fostered the development of self-reliance and related cultural traits. Finally, the distinctive features of frontier populations affected preferences and social norms at a formative stage and thus left a persistent imprint on local culture. These three factors—selective migration to the frontier, the effect of place on people, and cultural persistence—were all recognized by Turner (albeit not in a fully precise nor comprehensive way) and explored in many subsequent contributions, from which we draw below.

Selective Migration. In traditional narratives, frontier communities are characterized by the prevalence of both young single men, mostly of low socioeconomic status, many of them foreign, and large families seeking access to land (see, e.g., Eblen, 1965). Naturally, these distinctive features reflected the characteristics of individuals that were most willing and able to undertake migration and settle in locations with frontier conditions. The high male to female ratios and the prevalence of prime-age adults may be due to frontier conditions being especially hostile to women and elderly people, both because of the harsh natural environment and higher crime rates. Higher fertility in the frontier may be explained by land availability (Forster and Tucker, 1972; Leet, 1975; Yasuba, 1962).

Turner himself devoted attention to selective migration to the frontier, most clearly in his theory of
the “safety valve” whereby the frontier provided an outlet for unskilled urban workers, thus relieving pressure in Eastern labor markets and making wages higher than they would have been otherwise. Goodrich and Davison (1935, 1936) and Steckel (1989) do not find strong support for this theory, but Ferrie (1997) shows that unskilled urban workers were a significant part of Westward migratory flows in the 1850s and that the frontier offered benefits to those at the bottom of the ability distribution.

Another salient characteristic of frontier people was their high level of individualism. As noted in contemporary social psychology, migrants tend to have independent mindsets—particularly those moving to frontier locations, leaving their social environments to settle in remote and isolated contexts (see Kitayama et al., 2006; Jokela, 2009; Kitayama et al., 2010; Beck Knudsen, 2017).

Effects of Place on People. While frontier locations attracted people with specific traits, the frontier experience, in turn, influenced the settlers’ values, beliefs, and behavior. In Turner’s words, “a modification of the original stock occurred” in the frontier context. This modification can be explained by the opportunities and challenges created by the unique natural and social context of remote and often isolated frontier locations. The abundance of land and other natural resources offered ample profit opportunities, insofar as they were deftly exploited. On the other hand, frontier settlers often faced harsh climatic conditions and multiple types of danger—e.g., plagues, droughts, blizzards, and crop failure, as well as attacks from wild animals, Native Americans, and other settlers—often without the protection of social infrastructure providing prevention and care.

The opportunities and threats faced by frontier settlers may have favored individualism through an evolutionary mechanism. In the frontier context, people had to rely on themselves for protection and prevention, and to improve their living conditions. While the returns to cooperation may have been high, its scope was limited by the difficulties of maintaining reciprocity in a setting with high population mobility. Thus, individualistic traits had an adaptive value: beliefs and behavior based on independence and self-reliance made people better suited to cope with the frontier environment (Plaut et al., 2002; Kitayama et al., 2010).

In addition, resource abundance in frontier locations may have bred attitudes against government intervention because of favorable prospects of upward mobility and a large perceived importance of effort in income generation. Based on the theories outlined above, these conditions would tend to generate opposition to redistribution. Turner himself observed that in the frontier the “tax-gatherer is viewed as a representative of oppression,” since the environment “produces antipathy to control.” According to historical narratives, people in the frontier disliked any interference in their exploitation of nature’s resources, particularly from hierarchical institutions like the far-removed central government.

Cultural Persistence. The Guiso et al. (2006) definition of culture underlines persistence, as it refers to stable beliefs and values that are transmitted across generations. The persistent character of cultural

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9 Nisbett and Cohen (1996), Grosjean (2014), Restrepo (2015), and Couttenier et al. (2016) highlight the high levels of violence characterizing contexts of low population density and high population mobility, lack of well-defined property rights, and absence of clear mechanisms for law enforcement. While critics of Turner (e.g., Boatright, 1941) have emphasized the importance of cooperation in the frontier, his supporters have argued that cooperation was not inconsistent with individualism.

10 This view can be framed within a notion of culture as decision-making rules-of-thumb used in uncertain environments, as proposed by evolutionary anthropologists (Boyd and Richerson, 1985, 2005). In their models, a process of natural selection governed by the payoffs from different rules-of-thumb determines which rule prevails.

11 See Appendix ?? for a more detailed background and supportive evidence on this particular view.
traits has been emphasized by Roland (2004), Guiso et al. (2006), Nunn and Wantchekon (2011), and Alesina et al. (2013), among others. The theoretical contributions of Alesina and Angeletos (2005), Guiso et al. (2008), and Tabellini (2008) highlight the possibility of multiple equilibria in cultural traits, suggesting that once certain factors push a society toward a given cultural equilibrium, the outcome may persist in the long-run.\footnote{Turner himself suggested that the imprint of the frontier was persistent, as frontier societies had “certain common traits, and these traits have, while softening down, still persisted as survivals in the place of their origin, even when a higher social organization succeeded.”}

The idea that distinctive features at early stages of societal formation would have long-lasting effects is emphasized by Zelinsky (1973). His “doctrine of first effective settlement” argues that when “an empty territory undergoes settlement […] the specific characteristics of the first group able to effect a viable, self-perpetuating society are of crucial significance for the later social and cultural geography of the area, no matter how tiny the initial band of settlers may have been.”

Our goal in the remainder of the paper is to shed new empirical light on these three forces linking the historical formation of frontier culture to modern political economy outcomes.

3 Mapping the History of the Frontier

This section presents our method for mapping the history of the frontier. First, we explain how to use U.S. Census data and GIS techniques to determine the position of the frontier line at each point in time. Second, we use these tracking algorithms to define frontier counties and measure total exposure to the frontier by the time it is closed in 1890.

From colonial times until the late 19th century, America underwent massive population growth and rapid westward expansion. The process was documented in historical sources, like the noteworthy 1890 Census report on the Progress of the Nation (Porter et al., 1890), a key source of inspiration for Turner’s classic 1893 essay. The authors observed that the Thirteen Colonies, already settled communities by 1790, were “the sources of supply for a great westward migration,” as people “swarmed from the Atlantic coast to the prairies, plains, mountains, and deserts by millions during the last century.” The report described in great detail the evolution of population growth, the extent of the settled area, and the westward movement of the center of population from decade to decade throughout the 1790–1890 period.\footnote{The mean center of population as defined by the Census Bureau is an imaginary balance point at which weights of equal magnitude corresponding to the location of each person in an imaginary flat surface representing the U.S. would balance out.} It also suggested the notion of a “frontier,” which also appeared, in various ways, in previous works (see Mood, 1945; Juricek, 1966).

The population of the Thirteen Colonies was concentrated in close proximity to the East coast. From 1790 to 1890, as the nation’s population increased from 3.9 million to 62.6 million, the total settled area went from under 240,000 square miles to almost 2,000,000. In the same period, the mean center of population shifted westward over 500 miles, from a point in Maryland, just east of Washington D.C., to Decatur, Indiana.

The process of frontier settlement advanced continuously throughout the 1800s. However, the speed of westward shifts in the center of population varied considerably from decade to decade. The magnitude of the shift decreased from 1790–1800 to 1800–1810, only to speed up again in the next decade. The
maximum east-to-west shift was 127 km in 1850–1860, a decade of large immigrant inflows to the U.S. (2.8 million) and very fast overall population growth (a 35.5 percent increase). In the following decade, which witnessed the Civil War, the westward shift hit a 3-decade low of around 70 km, but it bounced back in the 1870s to around 90 km.

The Porter et al. Census report considered that the process of westward expansion was completed, and the frontier closed, by 1890. In a passage famously quoted in Turner’s essay, it stated that “Up to and including 1880 the country had a frontier of settlement, but at present the unsettled area has been so broken into by isolated bodies of settlement that there can hardly be said to be a frontier line.” Turner would go on to discuss some of the key geographic and political forces giving rise to variation in the shape and speed of westward expansion. We use this variation to develop a new measure of frontier exposure next and revisit these underlying forces in Section 6 when developing an empirical strategy for studying the long-run effects of the frontier.

3.1 Locating the Frontier and Tracking its Movements

In empirical studies of the American frontier, researchers have adopted simplifying definitions for specific contexts. In a study of the characteristics of westward migrants in 1850 and 1860, Steckel (1989) defines the frontier as those settlements in Minnesota, Iowa, Kansas, Texas, and those farther west. Ferrie (1997) studies migration to the frontier between 1850 and 1870 and defines the 90° west longitude as the frontier’s eastern boundary. Kitayama et al. (2010) simply associate the frontier with the Western United States.

In this paper, we adopt a definition of the frontier line that follows the Porter et al. (1890) report and Turner’s classic essay. While mentioning that the concept was “elastic,” Turner adopted the Porter et al. definition of the frontier line as the margin of settlement with population density of two per square mile or more. We use the location of the frontier line to define frontier counties as those (i) in close proximity to the frontier line—in our baseline, those with a centroid within 100 km of the frontier line—and (ii) with a population density below 6 people per square mile (this definition is also based on the 1890 Census report).14

For each Census year between 1790 and 1890, we calculate county-level population density per square mile. For intercensal years, we interpolate county-level population density by assuming a constant annual population growth rate that matches the decadal growth rate (replacing initial zeros with arbitrarily small values to avoid infinite growth rates). We maintain consistent units of observation over time by harmonizing all data to the 2010 boundaries using an approach suggested in Hornbeck (2010).15 While the harmonization and interpolation procedures may create measurement error, such

14 Consistent with their mapping conventions, Porter et al. (1890) defined six categories of settlement, the first of which was wilderness or vacant land, characterized by densities between 0 and 2 people per square mile, and the second was frontier settlement, characterized by densities between 2 and 6. See also Eblen (1965). The results are qualitatively unchanged if we redefine frontier counties with different distance cutoffs (both higher and lower than 100 km) and without imposing the density restriction of 6 people per square mile.

15 First, we intersect the county shapefiles from each of the decadal census years with the 2010 county shapefile and calculate the area of each intersection (all shapefiles come from the National Historical Geographic Systems database). When the 2010 county falls in one or more counties of the earlier shapefile, each piece of the 2010 county is assigned value equal to the share of the area of the piece in the earlier county multiplied by the total value of the data for the earlier county. Then, the data for each county in 2010 is the sum of all the pieces falling within its area. This harmonization procedure would be exact if all the data from the various years are evenly distributed across county areas.
error is largely confined to classical noise in county-level outcome measures and hence works against finding systematic effects of the frontier.

Using the annual county-level population densities between 1790–1890, we locate the frontier line for each year by drawing contour lines that divide counties with population densities above and below two people per square mile. Figure 1 plots the resulting lines for 1790, 1820, 1850, and 1890. Meanwhile, Appendix Figure ?? illustrates how closely our estimation of population density and the corresponding frontier lines match the historical map for 1860 in Porter et al. (1890). In constructing the primary frontier line in each year, we further discard line segments less than 500 km in length. This effectively discards several of the isolated pockets of dense populations beyond the main frontier line and pockets of sparse populations inside that line. Neither of these types of pockets correspond to the historical notion of the frontier as “margins of civilization”, and hence we retain only the core, connected frontier line emerging from east-to-west expansion. We further discard a second major frontier line emerging in California in the latter part of the 19th century, as the process of settlement on the West Coast was marked by the Gold Rush and distinct historical forces that are beyond the scope of the original Frontier thesis. The evolution of the resulting, primary frontier line from 1790 to 1890 can be seen in Figure 2, and it is this frontier expansion that forms the core of our analysis.

3.2 Measuring Total Frontier Experience

The uneven speed of westward expansion gives rise to differences across counties in time exposed to the frontier that we seek to exploit in our investigation of the long-run effects of frontier culture.

To measure the intensity of historical frontier experience at the local level, we calculate the number of years each county spent within the frontier belt during the period of frontier expansion from 1790 and 1890 as defined by the Census Bureau. We exclude from our analysis the counties that were already settled (i.e., east of the frontier line) by 1790, since the available data do not allow us to adequately measure total frontier experience. Furthermore, our sample excludes counties that were west of the 1890 main frontier line demarcating east-to-west expansion.

For each year between 1790–1890, we assign each county a dummy variable equal to one if it is considered to be in the frontier using our definition. In our main specification, we assign a county frontier status in a given year if its centroid (using 2010 county boundaries) is within 100 km of the frontier line in that year. Results are robust to other distance cutoffs. Then, the total frontier experience (TFE) for each county is the sum of indicators of frontier status from 1790 to 1890.

Figure 3 shows the spatial distribution of TFE, measured in years and using the 100 km frontier cutoff, for the counties included in our final sample. Total frontier experience ranges from 0 to 66 years, with a mean of 19.4 years and a standard deviation of 12 years, and displays substantial variation both across and within states and bands of latitude and longitude more broadly. Whether and how the cross-county differences in TFE matter today are the key questions we aim to answer.

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16Comparison maps for other years also demonstrates that the use of harmonized 2010 county boundaries has little effect on the location of the frontier relative to an approach based on contemporaneous county boundaries historically.

17From 1850 onward, the boundary between Arkansas and the Indian Territory (currently Oklahoma), where settlement did not advance, remained a part of the frontier line. Our results are robust to dropping from the sample the counties around this border.
4 The Distinctive Features of the Frontier

This section thoroughly documents the distinctive features of frontier locations. We do so with two complementary strategies: (i) a cross-sectional comparison across counties with different population densities reported below, and (ii) a within-county, longitudinal comparison of the years before and after a given county exits the frontier. The latter approach reinforces the former, delivering broadly similar insights, and hence we report this in Appendix ???. We focus on a set of demographic characteristics associated with the frontier in historical accounts: sex ratios, age distributions, fertility and literacy rates, and immigrant population shares. Moreover, we show that frontier locations were sharply different in levels of individualism as proxied by the share of children with uncommon names.

We draw upon historical Census data on gender, age, birthplace, and literacy from Haines and ICPSR (2010). For each of these variables, we use data for all available years between 1790 and 1890. For some variables we consider the white population only as this helps to attain consistency in the construction of variables across time periods and ensures that observed differentials in the demographic characteristics of interest are not driven by variation in the share of whites in the population. Further details on the construction of all variables used in this section can be found in Appendix ???.

Our measure of individualism is based on the names that parents give to their children. As suggested by the social psychology literature, individualistic types are prone to give their children unique names, reflecting a desire to stand out, as opposed to common names, which reflect a desire to fit in (Twenge et al., 2010). These choices have profound implications for children’s self-identity and hence social behavior. As such, the local prevalence of unique names captures important information about culture, an underlying theme across sociology (e.g., Lieberson and Bell, 1992), economic (e.g., Abramitzky et al., 2016; Fryer Jr. and Levitt, 2004), and psychology (e.g., Gureckis and Goldstone, 2009; Varnum and Kitayama, 2011) research on different aspects of unique names. In our setting, names offer a direct mechanism for persistence, linking parental preferences and socioeconomic behavior in the next generation.

We use full-count, historical Census data from several decades beginning 1850 to measure the share of children in a given county under 10 years of age with unique names and consider various approaches to quantifying uniqueness. Appendix ?? offers examples of common names in 1850 and 1880, which include John, William, Sarah, Elizabeth, among others. Beck Knudsen (2017) validates this type of unique names proxy by showing that it is strongly correlated with other commonly used measures of individualism both at the national and subnational level. Section 5.2 below provides evidence on the economic content of unique names in our setting.

The results in this section provide new empirical evidence in support of historical narratives about the rugged individualists settling the American frontier. While confirming that the frontier was different

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18 Historians and sociologists have devoted considerable attention to analyzing the demographics of frontier locations, in particular sex ratios, fertility rates, and age distributions (Bowen, 1978; Coombs, 1993; Demos, 1968; Easterlin et al., 1978; Eblen, 1965; Modell, 1971; Moller, 1945; Smith, 1928; Schaefer, 1985). While the findings often provide some support for stylized facts captured in traditional narratives, these studies are focused on specific places at particular points in time, making it difficult to establish general regularities about frontier demographics. This section offers a new step in that direction, representing the first systematic documentation of frontier demographics.

19 Another potentially confounding naming practice lies in the passing on of parental first names to children. Using data discussed in Section 5.1, we show that while only around three (five) percent of girls (boys) have such matronymics (patronymics), this practice is less common inside the frontier and significantly so for boys. Choosing novel names for one’s children rather than one’s own arguably reflects a desire to instill independence. As such, this finding is consistent with our broader claim that the higher prevalence of unique names inside the frontier reflects greater individualism.
along dimensions previously noted in the literature, our results also document just how different it was. Our results provide the first evidence of (i) a break in certain demographic characteristics at around the frontier boundary, and (ii) a higher prevalence of individualistic traits inside the frontier.

**Distinctive Frontier Populations.** We identify the distinctive features of the frontier using cross-sectional regressions relating population characteristic \( x \) in county \( c \) in Census division \( d \) at time \( t \) to the population density in that county. In particular, we estimate pooled, semiparametric regressions of the following form:

\[
x_{c dt} = \alpha + g(\text{population density}_{c dt}) + \theta_d + \theta_t + \varepsilon_{c dt},
\]

where \( g(\cdot) \) is some nonlinear function recovered using the partially linear (Robinson, 1988) estimator with Census division and year fixed effects, \( \theta_d \) and \( \theta_t \), respectively. While we estimate \( g(\cdot) \) across all counties in the sample, we restrict the graphs presented in this section to counties with less than 50 people/mi\(^2\) in order to focus on the local changes at the frontier threshold. In 1840, the midpoint of our study period, in the sample there are 437 counties in the range of 0 to 2 people/mi\(^2\), 303 counties from 2–6 people/mi\(^2\), 201 from 6–10, 540 from 10–50 people/mi\(^2\), and 41 from 50–100 people/mi\(^2\).

The graphs in Figure 4 described below plot 95 percent confidence intervals around \( g(\cdot) \).

**Demographics.** Figure 4(a) shows the distribution of the sex ratio (for whites) by level of population density. Males significantly outnumber females in less densely populated counties. The sex ratio displays a peak of around 1.6 in the most sparsely populated counties and declines sharply with population density until around levels of 3–4 people/mi\(^2\). The slope of \( g(\cdot) \) then flattens out, and the sex ratio stabilizes at around 1.05–1.1 males for every female.

Moreover, frontier settlers tended to be prime-age adults, with relatively fewer children and old individuals. Figure 4(b) bears this out by plotting estimates of \( g(\cdot) \) in equation (1) for the share of individuals in the age 15–49 range. This prime-age adult share declines sharply as we move towards density levels of 2–3 people/mi\(^2\) and eventually levels off at around 0.37. More dependent groups younger than 15 and older 49 are underrepresented on the frontier relative to the more densely settled areas to the east.

High fertility rates are another salient feature of the frontier borne out in our historical data. The availability of cheap land may have attracted families with children and also promoted childbearing among settler families. Unfortunately, direct measures of the number of children ever-born per woman are not available. Instead, we consider the ratio of total (white) children aged 0 to 5 over total (white) women aged 15 to 39 as a rough proxy for prevailing fertility within a given decade. Based on this proxy in Figure 4(c), we find that fertility rises from low levels in the most sparsely populated counties, peaks at around 2–3 people/mi\(^2\) and then secularly declines thereafter.

Figure 4(d) highlights another important feature of the types of individuals found on the frontier: literacy rates for white adults are significantly lower in more sparsely populated areas. Below 2–3 people/mi\(^2\),

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\(^{20}\)See Appendix Figure ?? for the full distribution of population density across counties in different decades. Note that, in any given time period, the frontier does not comprise all the sparsely settled counties in the sample. In 1880, for instance, among the counties in the sample with population densities below 6 people/mi\(^2\), over 60 percent were within 100 km from the frontier line, but the rest fall outside the strict definition of the frontier. While our aim is to establish the distinctive features of the frontier, we choose not to impose any specific definition in the baseline empirical strategy. Instead, we simply examine how key population characteristics vary with population density. Similar insights arise from a complementary approach examining how the same population characteristics vary with distance to the frontier.
people/mi², around one-quarter of the population in the average county is illiterate. The low levels of literacy observed in the frontier may be partly explained by the negative selection of westward migrants in the United States during this period, in line with Turner’s safety valve theory and the results in Ferrie (1997).

Finally, Panel (e) of Figure 4 presents evidence on the extent to which foreign-born immigrants contributed to frontier settlement over the 1800s. The nonlinear shape of $g(\cdot)$ shows that the immigrant population share was significantly higher in more sparsely populated counties. This is the visual evidence of the common historical account of long-distance migrants from abroad settling the frontier. Here, the $g(\cdot)$ gradually levels out at higher levels of density, of around 5–10 people/mi².

Looking across these outcomes, we consistently find evidence that demographic characteristics exhibit a sharp change roughly around our demarcation of the frontier line, consistent with the historical literature (see Section 3). For example, using the Chow (1960) test, we can easily reject the null hypothesis of a constant effect of population density (on all $x$) above and below 6 people/mi² (the upper bound of frontier settlement according to Eblen, 1965; Porter et al., 1890), or above and below any cutoff in the 2–6 range. Naturally, the precise turning points vary across outcomes. More agnostic Zivot and Andrews (2002) tests help identify unknown structural break points in each decade. In 1850, for example, we find a break in the sex ratio at 2.7, the prime-age adult share at age 2.0, and the share of foreign born at 3.4.

**Individualism.** The foregoing patterns provide robust evidence consistent with the historical accounts of the frontier discussed in Section 2.2. These demographic turning points had profound implications for the ensuing patterns of settlement along the frontier. However, in understanding the long-run effects of frontier exposure, it is important to determine whether the early settlers along the frontier fit the individualistic mold at the heart of prevailing historical narratives. The remainder of this section provides among the first rigorous empirical evidence that indeed the early settlers were more individualistic as captured by naming patterns recorded in the the full count 1850 and 1880 Census data.

Figure 5 displays a stark pattern in the uniqueness of names across counties that suggests a break in the relationship between individualism and population density. In particular, in the most sparsely populated counties, more than 65 (80) percent of boys (girls) aged 0–10 with native-born parents have names that are outside the top 10 most popular in that decade’s birth cohort within the Census Division. However, this ratio decreases sharply as we move towards counties with more than 2–3 people/mi², leveling off thereafter. The Zivot and Andrews (2002) test identifies a structural break in names for boys (girls) at 3.2 (2.6) people/mi² in 1850. We find broadly similar patterns when including children with foreign-born parents, restricting to children with native-born grandparents as seen in Appendix Figure ??, and using other measures of uniqueness (explored further in the long-run analysis in Section 6.3). The unique names of children on the frontier are consistent with the selective migration of individualistic people to the frontier and with the adoption of individualistic traits in these locations.

5 Frontier Roots of “Rugged Individualism”

In this section, we discuss the mechanisms through which the conditions of life in frontier settlements may have created a culture characterized by an emphasis on self-reliance and opposition to redistribution and to government intervention more broadly. The creation and subsequent persistence of frontier
culture depended crucially on the initial generation of individualistic settlers, who shaped the local culture of their communities.

We saw above that individualism proxied by unique names was more prevalent in the frontier. This may have resulted from the self-selection of individualists to the frontier where environmental factors then further promoted individualism, as discussed in Section 2.2. In Section 5.1, we provide evidence that selection can explain only part of the cultural differentiation in the frontier. Section 5.2 then document empirical patterns consistent with environmental factors playing a role as well. Appendix Section ?? provides further, descriptive evidence on why frontier conditions implied favorable prospects of upward mobility and a large perceived importance of effort in income generation. Combined with the adaptive value of individualism, these conditions could have fostered cultural opposition to redistribution and government intervention more broadly.21

The empirical results presented below, which we view as suggestive rather than conclusive, provide intuition and motivation for the long-run relationship between frontier experience and culture that we identify in Section 6. The roots of this long-run impact can be traced to the way in which individualism came to thrive in the frontier.

5.1 Selective Migration and Environmental Factors

An important question about our overarching interpretation concerns the role of self-selection in shaping observed cultural patterns on the frontier. It is difficult if not impossible to precisely disentangle the effect of people on a place versus the effect of a place on people. Yet, we can say something about whether self-selection of individualist types into the frontier can explain all of the observed differences in culture between frontier and non-frontier locations. We do so here by estimating a set of regressions that clarify how much of the contemporaneous frontier differential in unique naming patterns (seen, for example, in Figure 5) can be explained by selective migration. The results are consistent with selection being important but unable to fully account for the pervasiveness of unique names.

Table 1 reports estimates of the frontier differential in unique naming patterns based on versions of the following equation:

\[ P(\text{child has uncommon name}_{ic,1880}) = \alpha + \beta \text{frontier}_{c,1880} + x_{ic}'\zeta + \epsilon_{ic,1880}, \]

where the binary dependent variable equals one if child \( i \) residing in county \( c \) in 1880 has a name that falls within the top 10 nationally within that decade (similar results obtain with other measures of uniqueness), and the frontier indicator equals one if that county falls within the frontier according to our base-

---

21 Another potentially relevant mechanism we consider is the parasite-stress theory of collectivism detailed in footnote 3. We view this mechanism as important but less directly relevant to our findings for at least three reasons. First, using a 10 percent sample from the 1880 Population Census, which is the first to record information on sickness and disease, we can show that the prevalence of pathogens—associated with, among others, tuberculosis, malaria, and typhoid—does not exhibit the same sort of nonlinearities or structural breaks in population density as seen for demographics and individualism in the prior section. Second, our long-run empirical strategy detailed in Section 6 isolates variation in frontier experience that is arguably more localized than the main variation in pathogen prevalence at the core of parasite-stress explanations for individualism. Indeed, controlling for state fixed effects and/or a parsimonious set of geographic controls as we do below effectively removes all the variation in disease prevalence between frontier and non-frontier locations. Finally, for this mechanism to bind over a relatively short time period such as the century we consider, it should be the case that individuals have sufficient knowledge of the person-to-person nature of disease transmission to warrant behavioral responses favoring members of one’s own group, giving rise to collectivist culture.
line definition. We restrict attention to white children age 0 to 10 with native-born parents and cluster standard errors at the county level. The x vector includes age × gender and birth order fixed effects as well as indicators for whether the parents have unique names. However, these controls do not significantly affect estimates of \( \beta \). The inclusion of county fixed effects and various sample restrictions will help clarify how much of the \( \beta \) coefficient is plausibly due to selection.

To estimate selection patterns, we need to track households across time. For this purpose, we use full count data from the 1870 and 1880 Censuses available from ancestry.com (including location, names, and demographics), and link households across rounds using an algorithm from Feigenbaum (2016).

The overall differential in column 1 of Table 1 suggests that children in frontier locations in 1880 are around 10 percent more likely to have an uncommon name. Note that this includes children whose parents have lived in the frontier for at least 10 years as well as those who migrated at some time during the 1870s. Is this effect completely accounted for by the differential individualism between migrants from non-frontier to frontier counties and stayers in non-frontier counties?

Columns 2–5 provide an initial answer by restricting the overall sample to children whose parents resided in a non-frontier county in 1870. The coefficient \( \beta \) then identifies the differential naming behavior of parents who emigrate from eastern, non-frontier counties to frontier counties relative to those who stay in the non-frontier origins. The \( \beta \) coefficient falls from 0.075 to 0.052 in column 2 and then further to 0.023 in column 3 when including origin county fixed effects, which provides a sharper and more credible comparison to stayers in one’s county of origin rather than all non-frontier origins as in column 2. Columns 4 and 5 go a step further, restricting the sample to include only those children whose parents migrated to the frontier or stayed in the same non-frontier origin, effectively discarding parents who migrated across non-frontier counties or whose counties transitioned into or out frontier status during the 1870s. Across columns, we find that \( \beta \) is statistically significantly lower than in column 1.

Together, these results suggest that selection cannot fully explain the frontier differential in our leading proxy of individualism. It is of course still possible that selective migration before 1870, which cannot be observed in this data, help explain some of the differential in column 1. However, the results in this table help rule out a first-order, within-decade effect of selection, which is important given the high rates of migration to the frontier.

In sum, recent migrants to the frontier exhibit greater propensity to give their children uncommon names compared to those who never left their non-frontier county of origin. However, this differential is smaller than the overall differential between frontier and non-frontier residents, which suggests some scope for other environmental factors to explain why individualism appears to be more pervasive on the frontier. One explanation that we explore next is that individualism may be differentially rewarded on the frontier.

22 The base sample in 1880 is restricted to male household heads, native-born, aged 30–50, white, and who have at least one child (biological) aged 0–10, white, and native born. The target year is 1870. The set of potential matches for these men are first identified based on name, birth state and birth year. A random training sample is then drawn from among the potential matches and manually trained. The importance of each match feature is quantified using a probit model, and used to estimate a probability score for each link. A true match is defined as one with a sufficiently high score both in absolute and relative terms. The match rate was 26.4%. Further details can be found in Appendix ??.

23 Another useful comparison can be made by restricting the sample to stayers. We can show that among children whose parents did not move counties between 1870 and 1880, those born on the frontier are around 25 percent more likely to have an uncommon name. This effect suggests that the place differential, net of recent selective migration, is even larger.
5.2 The Returns to Individualism

The opportunities and threats faced by frontier settlers may have favored individualism through an evolutionary mechanism. In the frontier context, people had to rely on themselves for protection and prevention, and to advance their living conditions, so independence and self-reliance made people better suited to cope with the environment. In other words, individualistic traits had an adaptive value.

This section presents empirical patterns consistent with higher socioeconomic returns to individualism in frontier locations. In particular, we show that households exhibiting greater individualism tended to be more successful economically and to remain longer in frontier areas. We use data from the abovementioned linked sample, which contains information on occupation and education in the 1880 round. Our goal then is to understand whether unique names are associated with differential economic well-being inside versus outside the frontier. We do this in two steps.

First, we investigate the relationship between father $i$’s economic well-being in county $c$ in 1880, $y_{ic,1880}$, and unique names according to the following difference-in-difference type specification:

$$
y_{ic,1880} = \alpha + \beta \text{ own unique name}_i + \eta(\text{own unique name}_i \times \text{frontier}_{c,1880}) + \delta \text{ children unique name}_i + \zeta(\text{children unique name}_i \times \text{frontier}_{c,1880}) + \text{FE}_c + \epsilon_{ic},$$

where $\beta$ captures the hedonic returns to the father’s own unique name outside the frontier and $\eta$ the differential effect inside the frontier. At the same time, $\delta$ captures the association of unique name choices for children born during the 1870s and the father’s economic well-being outside the frontier and $\zeta$ the differential effect inside the frontier. We restrict attention to white, native-born fathers that did not change counties between 1870 and 1880 and that have at least one child. As above, we define uniqueness as the father having a name that falls outside of the top 10 nationally, but other definitions deliver very similar results. We measure status using either the Duncan (1961) socioeconomic index ($sei$) or the occupational score measure provided by the NAPP ($occscore$). Both measures range from 0 to 100 and capture the income returns associated with specific occupations in the 1950 Census while the $sei$ measure additionally captures notions of prestige as well as educational attainment. These measures are widely used in the economic history literature (see Olivetti and Paserman, 2015, for a discussion) and for our purposes mostly serve to capture broad differences in well-being across individuals. Finally, we cluster standard errors at the county level, and the county fixed effects, $\text{FE}_c$, account for all differences in outcomes that are common across individuals within the same county.

The estimates in Panel A of Table 2 are consistent with significant differential returns to individualism inside the frontier. Across all specifications, fathers with unique names outside the frontier exhibit socioeconomic status that is nearly 0.05 standard deviations lower than fathers with more common names. This is roughly the typical difference between a farmer and a blacksmith or a blacksmith and a carpenter. While we remain open to multiple interpretations, this apparent economic penalty could be due to various types of discrimination—albeit not based on race or citizenship—as seen in later periods within the United States. However, this penalty is more than offset inside the frontier where unique names exhibit a differentially positive association with well-being. We observe a similar differential for unique names of children, which exhibit a positive correlation with father’s well-being outside the frontier and an even stronger positive correlation inside the frontier. To the extent that unique names truly capture
individualism, these results, which hold for both $sei$ and $occscore$, suggest that individualist types are relatively better off inside the frontier.

In Appendix Table ??, we go a step further and show that this differential effect of individualism inside the frontier arises not only in levels but also in growth of socioeconomic well-being. The NAPP linked sample for 1870–1880 allows us to investigate changes in occupational standing for 1 percent of the entire population (i.e., a small subset of all individuals in the prior analyses). The results suggest that fathers with uncommon names exhibit significantly faster growth in $sei$ and $occscore$—25–75 log points depending on the specification—in the frontier but not outside the frontier.

While we are not making any causal claims, one concern with our interpretation is that these results are based on the selected sample of households that remained in the same county between 1870 and 1880. However, as we show in Appendix Table ??, individualist types that migrate to frontier counties are no more likely to exhibit higher economic well-being than those that migrate to non-frontier counties during this period. Among this population of movers, those with unique names for themselves and their children exhibit higher status, but do so equally when moving to frontier and non-frontier locations. Together, these findings suggest that there may be something particular to the frontier that rewards the types of behavior more commonly observed in people exhibiting a high degree of individualism. There are of course other explanations, but the patterns line up with the historical narrative fairly well.

Moreover, in Panel B of Table 2, we provide a second piece of evidence consistent with an individualist advantage inside the frontier. We estimate the following equation linking unique names to migration choices for household $h$ living in frontier county $c$ in 1870:

$$
\Pr(\text{outmigrate}_{hc}) = \alpha + \beta_f \text{ father has unique name}_h + \beta_m \text{ mother has unique name}_h + \eta \text{ any children with unique name}_h + \mathbf{F} \epsilon_c + \epsilon_{hc},
$$

where $\text{outmigrate}_{hc}$ is a binary outcome indicating whether the household moved from a frontier county in 1870 to a non-frontier county to the east by 1880. The key explanatory variables are as defined above with the mother’s unique name status defined similarly. The results suggest that, within a given frontier county, households in which fathers have unique names are around 4 percentage points less likely to leave the frontier for a more settled county to the east by 1880. This is a large effect given that 40 percent of linked households in our sample left the frontier for eastern, settled counties over this period.\textsuperscript{24} We observe little relationship to mother’s names but find that households with uniquely named children are also significantly less likely to leave the frontier. Of course, this latter result is less straightforward to interpret as we do not observe the timing of migration within the decade. Nevertheless, together, these findings suggest that both inherited and chosen individualism are associated with a higher likelihood of survival inside the frontier. By revealed preference, such migration choices are consistent with the economic differential for individualist types inside the frontier.

Overall, these findings point to a short-run evolutionary mechanism whereby individualist types were more likely to thrive in the frontier, thereby giving rise to incentives for maintaining this key cultural trait across generations. Indeed, we show in Appendix Table ?? that the within-family, intergenera-

\textsuperscript{24}In Appendix Table ??, we show that this migration accounts for the lion share of departures from frontier counties during this period. The other direction of migration—from frontier counties to other frontier counties—is not associated with unique names.
tional persistence in unique names is significantly higher inside the frontier.\textsuperscript{25} Recall that this persistence If this mechanism survived multiple generations, then it may help explain why one still finds such a distinct imprint of frontier culture in the political preferences and policies adopted by individuals in these areas more than a century later.

6 Long-Run Effects of Frontier Experience on Culture

We now turn to an investigation of how the early settlement process shaped culture in those areas that remained along the frontier for longer than others. There are several ways in which the individualistic early settlers identified above could have exerted lasting effects on the culture of these newly settled areas of the country over the next century. Our goal in the rest of the paper is to identify some of these effects as they relate to modern political economy debates. We start by presenting our empirical framework to examine the effects of historical frontier exposure on contemporary outcomes, discuss key data sources, and then move on to our main cross-county results. Finally, we discuss and present evidence on potential channels for long-run persistence.

6.1 Empirical Strategy

We aim to relate historical frontier exposure defined in Section 3.2 to modern measures of individualism and preferences for individuals in county $c$. In particular, our main county-level, cross-sectional estimating equation is given by:

\begin{equation}
y_c = \alpha + \beta \text{ total frontier experience}_c + x'_c \gamma + \text{FE} + \varepsilon_c,\end{equation}

where $y_c$ is some long-run outcome capturing cultural traits (for example, preferences for redistribution). Total frontier experience (TFE) is the amount of time (in decades) a given county remained on the frontier according to our baseline definition, restricting to those counties inside the extent of the historical frontier as seen in Figure 3. Robustness to alternative measures is considered in Section 6.5. The vector $x_c$ contains a set of county and where possible individual characteristics, and $\text{FE}$ are state or Census division fixed effects. In addition to these fixed effects, $x_c$ often includes latitude, longitude, and distance to rivers, lakes, and the coast.\textsuperscript{26} The coefficient $\beta$ therefore identifies a localized differential effect of TFE. Following the approach suggested by Bester et al. (2011), standard errors in all specifications are clustered on 60-square-mile grid squares that completely cover counties in our sample.\textsuperscript{27} When estimating effects for several correlated outcomes, we also report mean effects based on the widely used Kling et al. (2007) approach.\textsuperscript{28}

\textsuperscript{25}Recall from footnote 19 that this persistence is not driven by patronymic or matronymic naming behavior, which is actually less common in the frontier.

\textsuperscript{26}Further controls are discussed below, but it is important to note that all results are robust to the exclusion of controls. In fact, these controls often work against finding large effects of total frontier experience especially when using the instrumental variables approach detailed below, but we retain them as a baseline in order to be conservative.

\textsuperscript{27}Inference remains unchanged when using the computationally more intensive Conley (1999) spatial HAC estimator with a bandwidth of 300 km. We retain the arbitrary grid-cell approach as it is considerably easier to implement and less subject to instabilities, which becomes important as we move to an instrumental variables specification.

\textsuperscript{28}This approach offers one way to address the multiple inference problem. It effectively takes a weighted average of the estimates of $\beta$ for each of $K$ related outcome variables (placed on the same scale) with the weights equal to inverse sample
The main threat to causal identification of $\beta$ lies in omitted variables. We need to rule out a host of factors that may be correlated with TFE as well as contemporary culture. For example, areas with higher TFE may have had unfavorable endowments (e.g., mountainous terrain, low levels of agricultural productivity), high levels of conflict with Native Americans, or less exposure to public infrastructure investments such as the railroad, all of which may have independently affected cultural traits. Additionally, regulations facilitating access to land may have reduced time in the frontier and caused favorable views of government intervention. We address these concerns in three ways. First, we progressively add a richer set of controls aimed at removing as much of the confounded variation as possible. Second, we rule out additional concerns about omitted variables by using the Oster (forthcoming) approach to show that the degree of selection-on-unobservables is relatively limited. Finally, we pursue an instrumental variables (IV) strategy as a further robustness check.

We propose an IV approach that exploits the timing of immigration inflows to isolate plausibly exogenous variation in total frontier experience. The basic idea is that, while the process of westward movement may be thought of as a wave with time-varying speed, the time that a given location spends in the frontier depends on how fast the wave of westward expansion is going when passing through that location. From the perspective a given county in the American heartland, the instrument attains validity via the coincidental timing of immigration flows to the United States as a whole and westward expansions of the frontier in counties far to the east.

We construct the instrument as follows. First, we identify the relevant time frame for each county. The beginning of that period is the year in which the location is just west of the frontier, i.e., 110 km west of the frontier line. At this time, the county is still unsettled, and its local conditions do not affect the contemporaneous process of westward movement. We then consider the average annual immigrant inflow (in logs) as an exogenous predictor for the speed of the frontier wave in the next 60 years (recall that the max of frontier experience in the sample is around 60 years). Our approach can be thought of as a Bartik (1991)-inspired strategy, since we interact variation in local initial conditions—the year at which the relevant time frame starts for each county—with a national shock exogenous to local conditions.

Given the central role of immigration in shaping the westward evolution of the frontier, it is perhaps unsurprising that the instrument delivers a strong first stage. One way to visualize the strength of this plausibly exogenous frontier wave is to compare the longitude of the population center of the U.S. (see Section 3 and the green dot in Figure ??(b) for 1860) with the average annual immigrant inflow in the preceding 60 years. The sources of this strong linear relationship across decades can be seen in Appendix Figures ?? and ??.

In the baseline results that follow, we focus on OLS estimates of equation (5) and leave the IV results and other robustness checks to Section 6.5.

6.2 Data on Contemporary Culture and Political Economy

We measure contemporary individualism and preferences for government policy using data from multiple rounds of three widely used, nationally representative surveys—the Cooperative Congressional Election Study (CCES), the General Social Survey (GSS), and the American National Election Survey (ANES).
These surveys are staples in the social science literature on political preferences and social norms.\textsuperscript{29} The CCES is a phone-based survey conducted every two years around elections in November since 2006, the ANES is an in-person survey conducted annually since 1948, and the GSS is an in-person survey conducted annually since 1972. One advantage of working with all three datasets is that we can corroborate findings across surveys that ask questions about the same underlying preferences in different ways. For example, the CCES asks respondents if and how respondents would like state-level welfare spending to change whereas the ANES asks respondents if and how spending on the poor should change. The CCES also includes a set of questions on policy issues such as gun ownership that are particularly relevant to some of the mechanisms driving the persistence of frontier culture.

Despite their rich level of detail, these surveys have one important limitation for our purposes, namely the limited geographic scope. While the CCES has broad spatial coverage, the GSS and ANES do not (as seen in Appendix Figures ??–??). This proves especially challenging given our focus on spatial variation across a limited swathe of the United States outside of major coastal population centers. Nevertheless, for key outcomes across the three surveys, we are able to identify relatively precise effects.

These sample coverage limitations do not extend to the measure of unique names from the post-frontier Population Censuses noted above or to measures of actual policy outcomes in terms of Republican vote shares and reported property tax rates. The former come from Leip’s Atlas of Presidential Elections, and we focus on recent elections in the 2000s for simplicity. The latter are estimated from the American Community Survey in 2010 by the National Association of Home Builders. For all of these measures, we link county-level identifiers in the underlying data to the 2010 county boundaries as seen in Figure 3. Together, these multiple rounds of survey data and local voting records allow us to paint a rich picture of persistent culture of individualism and small-government norms in areas exposed to the frontier for a longer time during the 19th century.

6.3 Total Frontier Experience and Persistent Individualism

We begin by documenting a long-run link between the duration of total frontier exposure (TFE) and contemporary individualism. First, nearly half a century after the closing of the frontier, unique name choices for children are more pervasive in counties exposed to the frontier for a longer historical period. In Table 3, we report the effect of TFE ($\beta$ from equation 5) on the share of white boys and girls age 0–10 given unique names in the 1930s. This data from the full count 1940 Population Census captures naming choices at least one generation and as many as five generations after counties exited the frontier. Our baseline measure of uniqueness is the top 10 within the county’s Census division, and we report a battery of robustness checks based on different measures of uniqueness and sample restrictions on familial genealogy.\textsuperscript{30} In the average county, 73 percent of boys and 80 percent of girls have unique names with standard deviations of 0.07 and 0.04, respectively. In this and subsequent tables, we normalize the

\textsuperscript{29}See Acharya et al. (2016) for a recent example of using CCES and ANES in a related methodological setting and Alesina and Giuliano (2011) for a rigorous investigation of the determinants of preferences for redistribution in the GSS. Further details on all of the data sources discussed in the section can be found in Appendix ??.

\textsuperscript{30}One important dimension of robustness that we corroborate below is that the results are not sensitive to the cutoff for defining uniqueness (10, 25, 100, . . . ). This is likely due to the fact that naming frequencies in the United States follow a power law (see, e.g., Hahn and Bentley, 2003; Gureckis and Goldstone, 2009), and hence the mean above different cutoffs is identical up to a scaling constant in that cutoff.
dependent variables so that standard deviation effect sizes can be read directly from the coefficients.

Taking the most demanding OLS specification in column 4 of Table 3 suggests that each additional decade of TFE is associated with 0.13 and 0.20 standard deviations higher share of unique names for boys and girls, respectively. These results are quantitatively meaningful. For example, moving from counties with the minimum to the maximum TFE implies nearly 10 percent more children with unique names.

The main specification in column 4 is the result of progressively building on the specification in column 1 with no controls. Columns 2 and 3 add Census division and state fixed effects, respectively, to rule out broad regional differences in TFE and culture. Finally, column 4 captures several additional county-level confounders including latitude, longitude, county area, average rainfall and temperature, elevation, distance to rivers and lakes, distance to the coast, and predetermined potential agricultural yield.\footnote{Several of these factors may have given rise to particular cultural norms and also determined the speed of frontier transitions historically. Comparing across columns 1–4, the coefficient remains relatively stable despite large changes in the $R^2$. This pattern is consistent with relatively limited selection-on-unobservables according to the coefficient stability test parameters $\delta$ reported at the bottom of the table based on Oster (forthcoming), who suggests that values of $|\delta| > 1.3$ imply a limited role for unobservables in explaining our results.} Several of these factors may have given rise to particular cultural norms and also determined the speed of frontier transitions historically. Comparing across columns 1–4, the coefficient remains relatively stable despite large changes in the $R^2$. This pattern is consistent with relatively limited selection-on-unobservables according to the coefficient stability test parameters $\delta$ reported at the bottom of the table based on Oster (forthcoming), who suggests that values of $|\delta| > 1.3$ imply a limited role for unobservables in explaining our results.\footnote{In Section 6.5, we show that these findings hold up to a further set of (non-predetermined) controls for population density, diversity, and year of connection to the railroad. Furthermore, these results are not sensitive to the particular measure of uniqueness or the national background of the parents assigning names. We document this robustness for both OLS and IV specifications in Appendix Tables ?? and ??}. In both tables, column 1 replicates the full control result from Table 3. In columns 2-4, respectively, we restrict to children with native-born fathers, native-born parents, native-born grandparents, which, together, help address concerns about immigrants having unique name preferences and being more likely to settle in frontier areas historically. Column 5 defines uniqueness based on the top 10 names nationally while columns 6 and 7 do so at the state and county level, respectively. Columns 8 and 9 expands uniqueness to those outside the top 25 and top 100 names, respectively. Finally, column 10 restricts to non-biblical names to account for the fact that religiosity may be confounded with TFE and naming choices. All of these results reveal a similar persistent effect of TFE on this leading proxy for individualism.

Together with the findings in Section 4, these results suggest that unique name choices were not only more common in frontier areas historically but also persist over multiple generations in those areas exposed to the frontier for longer. Indeed, the effect of TFE on unique name choices can be seen in the early 1900s with little change thereafter. Appendix Table ?? shows that the effect sizes are relatively stable across the Census rounds from 1910 to 1940. This is consistent with the persistence of the early frontier culture of individualism.\footnote{Ideally, we could carry these results through to the contemporary period, but, unfortunately, the 1940 Census is the latest round that provides information on names. Although the Social Security Administration releases baby name counts by state,
Beyond unique names, we draw upon a well-suited measure from the ANES data to provide further evidence of the link between frontier history and high levels of individualism. Specifically, we draw upon the 1990 ANES round in which respondents were asked whether (1) “it is more important to be a cooperative person who works well with others”, or (2) “it is more important to be a self-reliant person able to take care of oneself.” Appendix Table ?? provides evidence that self-reliant preferences are stronger today in counties with longer exposure to the frontier historically. Around 55 percent of individuals respond in support of the cooperative answer. However, across different specifications, each decade of additional historical frontier experience is associated with around 2–6 percentage points (p.p.) lower support of cooperation over self-reliance. While the results with the full set of controls are noisy, we nevertheless view these findings as at least suggestive of longstanding claims about the rugged individualism born on the frontier. We turn now to investigate the closely related link between frontier exposure and opposition to government intervention.

6.4 Total Frontier Experience and Opposition to Redistribution and Regulation

This section uses a wide array of survey data to identify a long-run effect of total frontier experience (TFE) on contemporary preferences for small government. First, longer exposure to the frontier is associated with opposition to redistribution, preferences for limited government intervention, and low levels of local taxation. Second, Republican Party support is significantly higher in counties with higher TFE. Finally, TFE is associated with strong opposition to government regulations surrounding issues that were salient in frontier culture historically. We view all of these outcomes as closely connected measures capturing the same underlying opposition to government. In all cases, we report estimates of equation (5) including individual demographic controls (age, age squared, gender, and race dummies), survey wave fixed effects, and the full set of controls in column 4 of Table 3. We continue reporting supportive Oster (forthcoming) tests for selection-on-unobservables while instrumental variables results and other robustness checks are discussed in Section 6.5.

Redistribution and Limited Government. Our first set of results in Table 4 shows that longer frontier exposure historically is associated with stronger opposition to income redistribution today. In column 1, we draw upon ANES data from 1992 and 1996, which asks respondents whether they would like to see “federal spending on poor people be increased, decreased (or cut entirely) or kept about the same.” Around nine percent of individuals would like to see such redistributive spending decreased. Each additional decade of frontier exposure is associated with an additional p.p. increase in support of cuts. Columns 2 provides further evidence linking TFE to lower preferences for redistribution using the CCES. We find that each decade of TFE is associated with one p.p. higher support for cutting state spending on welfare. Although seemingly small relative to the mean of 40 percent, this effect size is roughly equivalent to the gap in opposition to such spending between individuals five years apart (with the older respondents usually more in favor of welfare spending cuts, reflecting well-known cohort differences in fiscal conservatism). We find similar effect sizes for a more extreme desire to “greatly” cut state spending on welfare.

*It does not do so at the county level as required for our empirical strategy.

34The question was designed explicitly for studies of American individualism (see Markus, 2001). Unfortunately, though, this question was only asked in a single round.
Following Alesina and La Ferrara (2005), column 3 uses a measure from the GSS indicating the intensity of preferences for redistribution on a scale from 1 to 7 with 1 indicating that the government should not be engaged in redistribution and 7 indicating the government should reduce income differences through redistribution. We normalize this measure but find qualitatively similar results when transforming it to a binary outcome equal to one for values $\geq 5$. Each additional decade of TFE is associated with around 0.03 standard deviations lower support for redistribution. This effect size is roughly equivalent to the difference between individuals that differ in age by 10 years (with older individuals again reporting less support for redistribution).

Turning to broader measures of opposition to big government, we show in columns 4 and 5 that current residents of areas with higher TFE are more prone to fiscal conservatism. Column 4 uses a CCES question on whether individuals would like to cut domestic spending or raise taxes to balance the federal budget. Column 5 uses an index based on the principal components of a set of questions from the GSS on whether the government spends too much on an array of different public goods and social transfers. In both cases, we find that individuals are significantly more opposed to high levels of government spending in areas with greater exposure to the frontier historically. The Kling et al. (2007) mean effects analysis yields similar insights as the individual outcomes, e.g., combining the two CCES measures into a single index yields a statistically significant effect of around 0.02.

Finally, we show in column 6 of Table 4 that these reported preferences are not a mere artifact of reporting bias but line up with actual policy differences across counties. In particular, we find that each decade of TFE is associated with around 3.5 percent lower reported property tax rates, which range from 0.1 to 2.9 percent across counties in our study.\textsuperscript{35} Given that much of the variation in tax rates lies across rather than within states, this is not a small effect. In fact, it is roughly akin to the within-state difference between counties that are 10 percent more versus less aligned with the Republican party, another policy outcome we revisit below.

Together, the findings in Table 4 suggest that historical frontier exposure is associated with significantly lower support for big government in the form of redistribution, spending, and taxation. These patterns line up with the conceptualization of persistent norms along the frontier as described in Section 2. To shed further light on the legacy of frontier culture, we next examine voting outcomes and preferences over a set of policies closely linked to frontier history.

**Party Identification.** Having documented systematic associations between total frontier experience, individualism and opposition to big government, we now turn to identify the relationship with conservative political party support. In particular, we show that these persistent effects of the frontier have strong implications for the growing strength of the Republican party, the contemporary bearer of conservative political platforms. We focus on Presidential elections since 2000. During this period, Republican party platforms have been clearly associated with a broad opposition to government intervention and aversion to tax redistribution. In fact, previous work by Rodriguez (1999) and Kerr (2014) has considered the Republican vote share as a proxy for preferences for redistribution.

Table 5 shows that individuals in areas with higher TFE are more likely to exhibit stronger preferences for the Republican party. Averaging across the five elections through 2016, column 1 shows that each

\textsuperscript{35}More than half of the variation in tax rates lies across rather than within states, and hence when including division instead of state fixed effects, we find an even larger effect size around 5.5 percent (see column 1 of Table ??).
decade of TFE is associated with around a 2 p.p. greater Republican vote share relative to the mean of 60 percent. We average for simplicity, but results are similar when pooling and including year fixed effects. This effect size is plausible and in line with individual-level regressions using degree of stated support for the Republican party in CCES.\textsuperscript{36} For perspective, though, the 2 p.p. effect is roughly the difference in population-weighted, average county-level vote shares in Iowa (48.4 percent) and Wisconsin (46.3 percent) over these five elections. That the results survive the demanding set of controls helps rule out concerns that our frontier measure is simply capturing regional variation within states, and in Section 6.5, we discuss further robustness to measures of county-level population density.

This average effect across the 2000s masks an interesting ratcheting up over time as seen in columns 2–6. In particular, the effect of an additional decade of TFE is associated with significantly higher Republican vote share with each additional election based on cross-equation tests of the relative effect sizes (i.e., coefficients divided by means). Moreover, each of the prior years’ effects is significantly smaller than the effect in 2016. In other words, the 2016 election exhibited a uniquely large frontier effect but was still part of a growing trend in that differential.

Putting these results together, the estimates in columns 7 and 8 provide marked evidence of the relatively larger shift towards the Republican party in areas with longer total frontier experience (TFE). The average heartland county in our long-run analysis exhibits a nine percent shift towards the Republican candidates between 2000 and 2016. Each additional decade of TFE is associated with an additional 1.6 p.p. relative to that mean. Alternatively, comparing a county at the 25th percentile of TFE (11 years) to a county at the 75th percentile of TFE (26 years), implies an additional 2.4 p.p. Republican party swing. As a benchmark, Autor et al. (2016) find that a similar interquartile shift in exposure to import competition from China implies a 1.7 p.p. Republican shift relative to a mean of -0.6 p.p. in their full-country sample of commuting zones. A similarly large shift can be seen in column 8, which shows the frontier effect on the Mitt Romney–Donald Trump differential between 2012 and 2016. Overall, these findings offer suggestive evidence of a potential link between frontier culture and the growing strength of the Republican Party in certain swathes of the American heartland.\textsuperscript{37}

In sum, the results in Table 5 suggest relatively more conservative political preferences in areas of the United States today that were part of the frontier for a longer period of time in the 19th century. In practice, individuals identify with and vote Republican for a number of reasons that are arguably too numerous to unpack in this paper alone. However, one consistent theme across Republican party platforms is the view that government should not be too heavily relied upon and hence government should be small. While this notion is somewhat vague and arguably selectively applied in political discourse, it does bear an interesting relationship to the individualistic norms described in historical accounts of the

\textsuperscript{36} Using the CCES 2007, 2012, and 2014 survey rounds, we construct an indicator equal to one if the respondent identifies as a “strong Republican” on a seven point scale ranging from “strong Democrat” to “strong Republican” with around 17 percent of individual–years reporting the latter. This individual-level measure of Republican party support is useful as it allows for us to control for potential confounders of political preferences such as age and race that may also be correlated with TFE. The estimates imply that an additional decade of TFE is associated with around 4.5 percent greater intensity of strong Republican support. As a benchmark, consider that with each additional year of age, individuals are around 2 percent more likely to report strong Republican support.

\textsuperscript{37} We refrain from taking a strong stand on the role of the frontier legacy in explaining the popularity of Donald Trump. Nevertheless, we would be remiss if we did not mention that there seems to be a segment of the (libertarian) right that has indeed made such a connection, however speculative. Some go so far as to directly liken his stances and peculiarities to the behaviors described in Turner’s original thesis (see, e.g., Mendenhall, 2017).
frontier. It is in this respect that we view these voting outcomes as reflecting actions taken by individuals with preferences shaped by frontier culture as seen in earlier results.\(^\text{38}\) As a coarse, summary takeaway, the Kling et al. (2007) mean effect on individualism (unique name share) and conservative political preferences (Republican vote share) and policy (property tax rate) suggests that each decade of historical frontier exposure leads to around 0.15 standard deviation more frontier culture today.

**Contentious Policy Issues.** We provide here additional insight into the nature of modern political preferences along the historical frontier. In Table 6, we use CCES data to relate total frontier experience to measures of (1) opposition to the Affordable Care Act (ACA or Obamacare), (2) support of an increase in the minimum wage, (3) support of a ban assault rifles, and (4) opposition to Environmental Protection Agency (EPA) regulations on pollution. For each of these outcomes, there is considerable variation across individuals in terms of support as gleaned from a simple comparison of means across outcomes.

These policy issues have been sharply contentious, with the main political parties adopting polarized positions. Moreover, they can be connected with a set of norms and beliefs pervasive on the frontier in terms of the link between effort and reward (ACA and minimum wage), the salience of manifest destiny (EPA regulations), and the right to bear arms of one’s choosing (ban on assault rifles).

The results in columns 1 and 2 suggest that individuals in frontier-exposed areas are significantly less likely to support the ACA and minimum wage hikes, respectively. The estimates are stable relative to possible controls (based on the Oster test) and again point to the fairly strong opposition to government intervention. For comparison, the effect sizes are on par with the roughly ten year age differences in support for these contemporary, bellwether conservative causes.

Meanwhile, in columns 3 and 4, we find further evidence that residents of frontier areas are more opposed to government regulation. Column 3 shows that each additional decade of exposure to the frontier is associated with around 3 percent less support for a ban on assault rifles. Initiated by President Clinton in 1994, the Federal Assault Weapons Ban was subsequently passed by several Democratic-leaning states such as California and Massachusetts. It remains a hot-button issue for gun rights advocates and may be especially salient in frontier areas with a history of violent confrontation with Native Americans and frontier justice more generally. Indeed, using the same CCES data, we can show that residents of counties with an additional decade of TFE are 2 p.p. more likely to own a gun today relative to a mean of 43 percent.

Finally, in column 4, we find that frontier-exposed areas exhibit less support for environmental regulation. In particular, we consider an indicator equal to one if the respondent is opposed to EPA regulation of CO\(_2\) emissions. The effect sizes are on par with if not slightly larger than those in preceding columns. Presuming older individuals have higher discount rates, a useful benchmarking exercise suggests that this effect is akin to the reduction in support for pollution regulation with each additional five years of age. Combining all of these estimates into a single index implies a mean effect of around 0.04 that is significant at the 1 percent level.

These results are suggestive about the reasons why frontier experience is associated with stronger support for the Republican party. But the effects of frontier experience go beyond party lines. While the

\(^{38}\)Consistent with this view, individuals that identify as Republican in the ANES data from 1990 are around 15–20 percent more likely to believe that it is better to be a self-reliant than a cooperative person, based on this proxy for individualism discussed in Section 6.3.
main parties are defined in part on these contentious policy issues, we argue in the following section that the findings here are not driven purely by tribal party affiliation but rather capture something deeper.

Overall, the findings in Tables 4–6 paint a rich picture of the cultural legacy of historical frontier exposure on political preferences. While we are unable to observe these modern outcomes throughout the 20th century, it is plausible that the early settlers left a lasting imprint on frontier locations and that the degree of that imprint increased with duration of exposure.

6.5 Instrumental Variables and Other Robustness Checks

This section presents several results aimed at strengthening the credibility of the main OLS findings in Tables 3–6 on the long-run legacy of frontier culture. First, we demonstrate the robustness of our findings to alternative measures of total frontier experience. Second, we show that most of our findings hold using the instrumental variables (IV) specification discussed in Section 6.1. Third, we show robustness to a host of controls for important confounders of frontier experience and modern preferences. Finally, we show that the effects of frontier experience on views about government cut across party and class lines.

Alternative Measures of Total Frontier Experience (TFE). Our baseline measure of TFE aimed to closely follow definitions in the historical literature as discussed in Sections 3.1 and 3.2. In Tables ??–??, we demonstrate the robustness of measure of TFE to three relevant margins of adjustment to what it means for county \( c \) to be inside the frontier at time \( t \). First, we reduce the catchment area from 100 km to 75 and then to 50 km in proximity to the frontier line. Second, we adjust the density restriction to include counties with \( > 2 \) people/mi\(^2\) but still less than 6 and then remove the population density restriction altogether. Finally, we consider defining the frontier line as including only the main, westernmost extent of all counter lines identified by the GIS algorithm. While all outcomes do not survive all TFE definitions, the overwhelming message from Tables ??–?? is that our particular choice of the frontier definition based on the historical record is not driving the findings on unique names or opposition to state intervention, redistribution and regulation.

IV Estimates. Table 7 presents instrumental IV estimates for the main outcomes. We report results based on the full control, baseline specification from column 4, and the instrument is strong across all specifications as seen in Kleibergen and Paap (2006) first stage Wald statistics.\(^{39}\) For a majority of the outcomes, the estimated effects of frontier experience remain statistically and quantitatively significant. While most of the significant IV estimates are statistically indistinguishable from the OLS estimates, a few—e.g., unique names in columns 1–2, property tax rate in column 8, and Republican vote share in column 13—are relatively larger perhaps due to the potential sources of downward bias mentioned above. Yet, some of the survey-based outcomes are not as robust. Several but not all of the estimates for the CCES outcomes in particular lose statistical and in some cases quantitative significance. However, it is worth noting that this lack of significance is driven by (a subset of) the demanding geographic and agroclimatic control variables \( \mathbf{x} \), which apparently leave little scope for the instrument to identify residual covariation between TFE and the given CCES outcome. The OLS results do not exhibit similar

\(^{39}\)Corresponding Lagrange-Multiplier tests for underidentification easily pass conventional significance thresholds, and weak-instrument robust confidence intervals deliver qualitatively identical results as conventional inference reported in the table.
sensitivity to the x controls. Overall, these IV estimates largely corroborate the findings from the simpler OLS specifications. The overarching patterns continue to support a strong link between TFE and modern culture as reflected in political preferences and policy outcomes.

**Potential Mediators of Long-Run Effects.** Table 8 goes a step further towards addressing plausible mediators of the long-run effect of frontier experience on modern preferences. One salient concern about our long-run results is that they reflect the fact that places with greater frontier experience are less densely populated today, leading our results merely to capture a well-known urban–rural divide in preferences. We address this concern by including quadratic polynomials in county-level population density both at the time the frontier closed in 1890 as well as in 2010. Another concern is that frontier experience is associated with greater diversity in residents’ birthplaces, both domestic and abroad. This was the case in the contemporaneous historical period as we saw in Section 4 (and Appendix ??) and could have persisted through the 20th century with direct implications for individualism and preferences over redistribution. We capture both historical and modern diversity with birthplace fractionalization indices in 1870 and 2000, respectively. Finally, one may concerned that total frontier experience is higher in counties that were connected to the railroad later in the 19th century. This later exposure to major public investments associated with the railroad may have in turn directly shaped views about the role of government that persisted over the long-run. We address this concern by controlling for the year in which each county was first connected to a rail line according to data from Atack et al. (2010).

Although each of these measures are co-determined with frontier exposure historically, these “bad controls” do not significantly change the key takeaways from the baseline OLS or IV estimates as seen in Panels A and B, respectively. Several of the estimated effects of frontier exposure become smaller, which is consistent with the plausible channel of mediation, but most of the implied effects remain sizable and important. This suggests that the legacy of the frontier operates in channels that go beyond these density, diversity, and railroads. In Appendix Tables ??–??, we report simpler OLS specifications with these controls (entered linearly) to illustrate the underlying direction of mediation. Overall, this robustness is reassuring and broadly consistent with the limited selection-on-unobservables revealed by the Oster (forthcoming) tests discussed in the previous sections.

**Frontier Effects Go Beyond Party and Class Lines.** A related exercise helps clarify the findings on individual preferences for redistribution and size of government. As noted earlier, many of the policies elicit strong partisanship within the U.S. with Republicans and Democrats hewing closely to the party line. However, as seen in Tables ?? and ??, higher total frontier experience is associated with stronger opposition to government intervention even after controlling for the strength of Republican party support in the CCES. Moreover, these long-run effects of the frontier survive further controls for individual education and family income. Again, although these covariates are potentially “bad controls”, their inclusion

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40Moreover, all of the IV results for CCES outcomes, excluding the welfare preference outcome in column 6, become significant once we drop controls, with latitude, longitude, distance to rivers, and temperature being key factors.

41That is, we take $1 - \sum_o (\text{birthplace}_{oc}/\text{population}_c)^2$, which is simply 1 minus the Herfindahl concentration index for origin $o$—each U.S. state and country abroad—birthplace diversity in county $c$. Birthplaces are defined as either a given state within the U.S. or a given country or country grouping abroad. We lose some counties on account of missing coverage in the 1870 Census, but results in Table 7 are unchanged when restricted to the smaller sample in Panel B.

42The results are also robust to estimating the effects of frontier experience for former slave- and non-slave-states separately.
helps rule out the concern that all of the observed effects are driven by prolonged frontier experience simply leading to tribal party- and class-based identity unrelated to the deep roots of frontier culture.

7 Conclusion

The American frontier has long been a prominent theme in the cultural and political history of the United States. This paper examines the contemporaneous and long-run effects of the American frontier on culture at the subnational level. First, we show that U.S. locations in the frontier were characterized by strikingly different demographics and higher prevalence of individualistic traits. We offer new evidence that these traits conferred differential socioeconomic returns on the frontier. Second, we show that locations with longer frontier experiences exhibit higher contemporary levels of inclination toward self-reliance and stronger opposition to government intervention in the form of taxation, redistribution, and other regulations. This provides one of the first pieces of systematic evidence consistent with Turner’s famous thesis about the cultural traits nurtured on the frontier.

Our research offers advances in the study of a prominent dimension of American history both in terms of results and methods. We provide a comprehensive account of the history of the frontier by locating its position and tracking its movements from 1790 to 1890. In addition, we introduce a new approach to measuring historical frontier exposure that may be useful in other attempts to understand the legacy of the frontier. Moreover, our findings establish the deep roots of some salient aspects of American culture, shedding light on contemporary political debates.

Indirectly, our findings may help to shed new light on the historical origins and persistence of the uniquely high degree of individualism and opposition to redistribution in the United States. Nevertheless, this study is best suited to identifying the effects of frontier experience at the local level, so any extrapolation to higher levels of political and social organization is speculative. Understanding the wider implications of frontier culture remains an important topic for future research.
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Figures

**Figure 1:** Population Density and the Frontier for Selected Years

*Notes:* Based on county level data from National Historical Geographic Information System: Version 11.0. Population allocated across years and counties based on the procedure described in Section 3.1, which builds upon Hornbeck (2010).
Figure 2: The Evolution of the Frontier, 1790 to 1890

Notes: Based on county level data from National Historical Geographic Information System: Version 11.0. The frontier lines demarcate the counties with below and above population density equal to 2 people per square mile. The frontier lines presented above are only those resulting from westward expansions and after removing smaller “island frontiers” lines in the interior using the rules described in Appendix ??.
Figure 3: Total Frontier Experience

Notes: Based on county level data from National Historical Geographic Information System: Version 11.0. Total frontier experience is the total number of years the county was within 100 km of the frontier and its population density was below 6 people/mi², between 1790–1890.
Figure 4: Distribution of Demographic Characteristics by Population Density

(a) Sex Ratio

(b) Prime-Age Adult Share

(c) Fertility

(d) Illiteracy

(e) Foreign-Born Share

Notes: These figures plot semiparametric estimates of the relationship between population density and five demographic characteristics prominent in historical accounts of the frontier. We estimate these nonparametric curves \( g(\cdot) \) based on the Robinson (1988) partially linear approach, pooling across all years 1790–1890 for each county \( c \). The specification includes Census division and year fixed effects and are based on an Epanechnikov kernel and rule-of-thumb bandwidth. The dashed lines are 95 percent confidence intervals. The estimates are recovered over all counties, but the figure zooms in on those with less than 50 people/mi\(^2\) for presentational purposes. All data come from the county level records from National Historical Geographic Information System: Version 11.0. (a) Sex ratio for whites is the ratio of the number of white males over white females. (b) Share white 15–49 is the fraction of whites aged 15–49 over the total number of whites. (c) Our proxy for fertility is simply equal to the number of children aged 0–5 per women aged 15–39 (for whites). (d) Share of whites aged 20+ Illiterate is the number of illiterate whites aged 20 or older over the number of whites aged 20 or older. (e) Share of Pop Foreign Born is the ratio of the the number of foreign born persons over total population.
Figure 5: Distribution of Uncommon Children Names (for Whites Aged 0-10 with Native-Born Parents) by Population Density

(a) Boys

(b) Girls

Notes: Based on county level data from National Historical Geographic Information System: Version 11.0 Database. The dependent variables on the left (right) is the county level share of girls (boys) aged 0-10 with native parents and have names outside of the top 10 popular names in their corresponding Census division. The semiparametric specification is otherwise the same as in Figure 4. See the notes therein for details.
**Table 1**: Selective Migration Does not Fully Explain Unique Names on the Frontier

<table>
<thead>
<tr>
<th>Dependent Variable: Child Given Unique Name in 1870s</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Restriction: White, Native-Born Parents + none</td>
<td>Resident of Non-Frontier County in 1870</td>
<td>stayers non-frontier</td>
<td>migrants to frontier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1870 County of Residence Fixed Effects</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>resident of frontier county in 1880</td>
<td>0.075*** (0.018)</td>
<td>0.052*** (0.015)</td>
<td>0.023*** (0.007)</td>
<td>0.037*** (0.012)</td>
<td>0.010* (0.005)</td>
</tr>
<tr>
<td>Number of Children, Age 0–10</td>
<td>1,239,513</td>
<td>1,224,068</td>
<td>1,224,068</td>
<td>647,479</td>
<td>647,479</td>
</tr>
<tr>
<td>Mean Unique Name Share</td>
<td>0.708</td>
<td>0.708</td>
<td>0.708</td>
<td>0.714</td>
<td>0.714</td>
</tr>
<tr>
<td>R²</td>
<td>0.02</td>
<td>0.02</td>
<td>0.03</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Gender × Age Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Birth Order Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Mother and Father Unique Name Status</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes: This table reports estimates of equation (2) based on the linked sample of households in the 1870 and 1880 full county Population Census. The linking is done using the procedure described in Section 5.1. The sample is restricted to children age 0–10 with white, native-born parents. Columns 2-5 restrict to those households living in non-frontier counties in 1870. Columns 4 and 5 further restrict to those individuals who migrated from a non-frontier county in 1870 to a frontier county in 1880 or who remained inside the same non-frontier county in both decades. Children have a unique name if their name falls outside the top 10 nationally during that decade. Similar results obtain for the top 20. The explanatory variable equals one if the household resides in a county that is inside the frontier as defined using the distance and population density cutoffs described in Section 3. Standard errors are clustered at the county level in 1870. Significance levels: * : 10%   ** : 5%   *** : 1%.
Table 2: Unique Names, Socioeconomic Success and Survival in the Frontier

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A:</strong> Father’s Economic Status in 1880</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dep. Var.: normalized <em>seius</em> (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>father has unique name</td>
<td>-0.045*** (0.005)</td>
<td>-0.047*** (0.005)</td>
<td>-0.048*** (0.005)</td>
<td>-0.049*** (0.005)</td>
<td>-0.044*** (0.005)</td>
</tr>
<tr>
<td>father has unique name × frontier county</td>
<td>0.072** (0.033)</td>
<td>0.069** (0.033)</td>
<td>0.075** (0.033)</td>
<td>0.081*** (0.007)</td>
<td>0.080*** (0.007)</td>
</tr>
<tr>
<td>at least one child 0-10 has unique name</td>
<td>0.081*** (0.007)</td>
<td>0.080*** (0.007)</td>
<td>0.065*** (0.007)</td>
<td>0.073* (0.042)</td>
<td>0.066 (0.042)</td>
</tr>
<tr>
<td>at least one child 0-10 has unique name × frontier county</td>
<td>0.081*** (0.007)</td>
<td>0.080*** (0.007)</td>
<td>0.065*** (0.007)</td>
<td>0.073* (0.042)</td>
<td>0.066 (0.042)</td>
</tr>
<tr>
<td>Dep. Var.: normalized <em>ocscorus</em> (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>father has unique name</td>
<td>-0.042*** (0.009)</td>
<td>-0.041*** (0.009)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mother has unique name</td>
<td>-0.010 (0.007)</td>
<td>-0.009 (0.007)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at least one child 0-10 has unique name</td>
<td>-0.026** (0.011)</td>
<td>-0.023** (0.011)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Individuals</td>
<td>264,038</td>
<td>264,038</td>
<td>264,038</td>
<td>264,038</td>
<td>264,038</td>
</tr>
<tr>
<td>R²</td>
<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td>Sample Restriction</td>
<td>Native-Born, Age 30–50, White, Non-Migrant 1870–1880</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>County Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

| **Panel B:** Dep. Var.: Migrates from Frontier County in 1870 to Non-Frontier Eastern County in 1880 |      |      |      |      |      |
| father has unique name | -0.042*** (0.009) | -0.041*** (0.009) |       |       |       |
| mother has unique name | -0.010 (0.007) | -0.009 (0.007) |       |       |       |
| at least one child 0-10 has unique name | -0.026** (0.011) | -0.023** (0.011) |       |       |       |
| Number of Individuals | 27,066 | 27,066 | 27,066 | 27,066 | 27,066 |
| Mean of Dependent Variable | 0.410 | 0.410 | 0.410 | 0.410 | 0.410 |
| R² | 0.08 | 0.07 | 0.07 | 0.08 | 0.08 |
| Sample Restriction | Native-Born, Age 30–50, White Frontier Resident in 1870 | Yes | Yes | Yes | Yes |
| Origin County Fixed Effects | Yes | Yes | Yes | Yes | Yes |

Notes: This table reports estimates of equation (3) in Panel A and equation (4) in Panel B based on the same linked sample of households from the 1870 and 1880 Census described in the notes to the previous table and at length in Section 5.1. Unique name measures are as defined elsewhere and based on the top 10 nationally for all family members. The frontier dummy in both panels is based on our core time-varying measure described in Section 3.1. In Panel A, the dependent variable in columns 1-4 is the normalized Duncan (1961) socioeconomic index (*seius*) and in column 5 is the normalized occupational score (*ocscorus*), both provided by the North Atlantic Population Project (NAPP). The sample in Panel A includes all male household heads (fathers) that did not migrate across counties between 1870 and 1880. Standard errors are clustered at the county level. The sample in Panel B is restricted to households residing in frontier counties in 1870, and the dependent variable equals one if the household moved to a non-frontier county in the east by 1880. Standard errors are clustered at the origin county. All regressions include dummies for the number of children born in the 1870s. Significance levels: * : 10%  ** : 5%  *** : 1%. 

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Table 3: Total Frontier Experience and Unique Name Choices Persist into the 20th Century

<table>
<thead>
<tr>
<th>Panel A: Share of Boys with Unique Names</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>frontier experience</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Oster $\delta$ for $\beta = 0$</td>
</tr>
<tr>
<td>Number of Counties</td>
</tr>
<tr>
<td>$R^2$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Share of Girls with Unique Names</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>frontier experience</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Oster $\delta$ for $\beta = 0$</td>
</tr>
<tr>
<td>Number of Counties</td>
</tr>
<tr>
<td>$R^2$</td>
</tr>
</tbody>
</table>

Notes: This table reports estimates of equation (5) for our leading proxy of individualism in the 20th century, the share of boys and girls age 0–10 with unique names in the 1940 Census. The dependent variable is normalized so that the coefficient indicates the standard deviation effect of each additional decade of frontier exposure historically. The sample is restricted to counties with some frontier experience based on the measure described in Section 3.2. The baseline measure of uniqueness is given by the share of children in county $c$ with a name that falls outside the top 10 names for children born in the same Census division within the given decade. Other measures of unique names are considered in Appendix Table ???. Frontier experience is expressed in decades. Column 1 is the simple bivariate regression. Columns 2 and 3 add Census division and state fixed effects. Column 4 adds the following controls: county area; county centroid latitude and longitude; distance to oceans, lakes and rivers from county centroid; mean county temperature and rainfall; elevation; average potential agricultural yield. Standard errors are clustered based on the arbitrary grid-cell approach of Bester et al. (2011) as detailed in Section 6.1. Inference remains unchanged when using the computationally more intensive Conley (1999) spatial HAC estimator with a bandwidth of 300 km.

Significance levels: * : 10%  ** : 5%  *** : 1%.
Table 4: Total Frontier Experience and Opposition to Government Intervention and Redistribution

<table>
<thead>
<tr>
<th>Data Source:</th>
<th>ANES</th>
<th>CCES</th>
<th>GSS</th>
<th>CCES</th>
<th>GSS</th>
<th>ACS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable:</td>
<td>Prefers Cut Public Spending on Poor</td>
<td>Prefers Cut Public Spending on Welfare</td>
<td>Believes Gov’t Should Redistribute</td>
<td>Prefers Reduce Debt by Spending Cuts</td>
<td>Index of Preferences for Spending Cuts</td>
<td>County Property Tax Rate, 2010</td>
</tr>
<tr>
<td>Scale:</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
</tr>
<tr>
<td>frontier experience</td>
<td>0.010** (0.004)</td>
<td>0.011*** (0.004)</td>
<td>-0.022* (0.012)</td>
<td>0.013*** (0.002)</td>
<td>0.034*** (0.010)</td>
<td>-0.032*** (0.006)</td>
</tr>
<tr>
<td>Oster ( \delta ) for ( \beta = 0 )</td>
<td>5.6</td>
<td>6.5</td>
<td>6.3</td>
<td>2.4</td>
<td>2.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Mean of Dependent Variable</td>
<td>0.09</td>
<td>0.40</td>
<td>0.00</td>
<td>0.43</td>
<td>0.00</td>
<td>1.02</td>
</tr>
<tr>
<td>Number of Individuals</td>
<td>2,322</td>
<td>27,749</td>
<td>9,085</td>
<td>169,536</td>
<td>5,739</td>
<td>–</td>
</tr>
<tr>
<td>Number of Counties</td>
<td>95</td>
<td>1,732</td>
<td>255</td>
<td>2,000</td>
<td>253</td>
<td>2,028</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.04</td>
<td>0.04</td>
<td>0.06</td>
<td>0.04</td>
<td>0.07</td>
<td>0.82</td>
</tr>
<tr>
<td>Survey Wave Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>–</td>
</tr>
<tr>
<td>Individual Demographic Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>–</td>
</tr>
<tr>
<td>State Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Geographic/Agroclimatic Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes: This table reports estimates of equation (5) for several measures capturing preferences for redistribution and state spending as well as actual property tax rates. Full details on the outcomes can be found in Appendix ???. We use all available survey rounds with the given outcome, and in all cases, we restrict to those counties in our main sample as described in the notes to Table 3. The ANES measure in column 1 equals one if the respondent prefers that federal government spending on poor people be cut. The CCES measure in column 2 equals one if the respondent would prefer to cut public spending on welfare programs. The GSS measure in column 3 is a normalized measure of intensity of support on a 7-point scale of the statement that the government should reduce income differences in society through redistribution. The CCES question in column 4 equals one if the household would prefer that the state budget be balanced through spending cuts rather than tax increases. The GSS measure in column 5 is a normalized first principal component analysis (PCA) index based on a series of questions about whether the government spends too much on different public goods and transfer programs. The measure of county-level property tax rates in column 6 is estimated from American Community Survey data from 2010. Combining estimates from different columns and related outcomes across subsequent tables yields mean effects estimates based on the Kling et al. (2007) approach that retain statistical significance of the frontier effect. All columns are based on the specification in column 4 of Table 3 with additional individual-level controls for age, age squared, gender, and race. Standard errors are clustered based on the arbitrary grid-cell approach of Bester et al. (2011) as detailed in Section 6.1. Significance levels: *: 10%  **: 5%  ***: 1%.
Table 5: Total Frontier Experience and the Rising Republican Vote Share

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Republican Vote Share in . . . Presidential Election</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000–16 (Avg.) 2000 2004 2008 2012 2016 Δ '16–'00 Δ '16–'12</td>
</tr>
<tr>
<td>frontier experience</td>
<td>1.887*** (0.353) 1.276*** (0.326) 1.530*** (0.345) 1.719*** (0.367) 2.057*** (0.391) 2.852*** (0.412) 1.576*** (0.261) 0.795*** (0.124)</td>
</tr>
<tr>
<td>Oster δ for β = 0</td>
<td>14.24 -17.20 24.66 5.87 9.17 26.62 9.12 -5.20</td>
</tr>
<tr>
<td>Number of Counties</td>
<td>2,035 2,035 2,035 2,035 2,035 2,035 2,035 2,035</td>
</tr>
<tr>
<td>Mean of Dependent Variable</td>
<td>60.0 56.6 60.3 57.4 60.6 65.4 8.9 4.9</td>
</tr>
<tr>
<td>R²</td>
<td>0.22 0.19 0.20 0.27 0.24 0.21 0.21 0.26</td>
</tr>
</tbody>
</table>

Notes: This table reports estimates of equation (5) for measures of the county-level Republican vote share in the last five presidential elections with data from the Leip Atlas. Column 1 averages across all five elections. Columns 2–6 report year-specific effects. The sample and measure of frontier experience are as described in the notes to Table 3, and all estimates are based on the specification in column 4 from that table. Cross-equation tests reveal that the effect sizes are statistically different in each subsequent year and each year is statistically different from 2016. Standard errors are clustered based on the arbitrary grid-cell approach of Bester et al. (2011) as detailed in Section 6.1. Significance levels: * : 10% ** : 5% *** : 1%.

Table 6: Total Frontier Experience and Preferences Over Contentious, “Frontier-Relevant” Policy Issues

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Prefers Repealing Affordable Care Act</th>
<th>Supports Increasing Minimum Wage</th>
<th>Supports Banning Assault Rifles</th>
<th>Opposes EPA Regulation of CO₂ Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) (2) (3) (4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>frontier experience</td>
<td>0.023*** (0.004) -0.023*** (0.007) -0.017*** (0.004) 0.016*** (0.004)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oster δ for β = 0</td>
<td>3.0 3.2 2.7 2.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Individuals</td>
<td>29,432 5,134 29,390 29,203</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Counties</td>
<td>1,727 1,066 1,722 1,717</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean of Dependent Variable</td>
<td>0.535 0.688 0.630 0.317</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.06 0.06 0.09 0.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey Wave Fixed Effects</td>
<td>Yes Yes Yes Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Demographic Controls</td>
<td>Yes Yes Yes Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Fixed Effects</td>
<td>Yes Yes Yes Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geographic/Agroclimatic Controls</td>
<td>Yes Yes Yes Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: This table reports estimates of equation (5) for four measures of support for conservative issues that are particularly relevant to the frontier setting in historical accounts. These are all binary indicators based on questions in the CCES across different years. The measure in Column 1 equals one if the individual in 2014 believes that the Affordable Care Act (ACA) should be repealed, in Column 2 equals one if the individual in 2007 supports an increase in the minimum wage, in Column 3 equals one if the individual in 2014 supports a ban on assault rifles, and in Column 4 equals one if the individual in 2014 opposes regulation of pollution by the Environmental Protection Agency (EPA). The set of specifications are otherwise the same as in Table 3; see the notes therein for details. Standard errors are clustered based on the arbitrary grid-cell approach of Bester et al. (2011) as detailed in Section 6.1. Significance levels: * : 10% ** : 5% *** : 1%.
Table 7: Instrumental Variables Estimates for Main Outcomes

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>1940 Pop. Census</th>
<th>ANES</th>
<th>CCES</th>
<th>GSS</th>
<th>CCES</th>
<th>GSS</th>
<th>ACS</th>
<th>CCES</th>
<th>Leip</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Unique Name Share</td>
<td>Prefer Cut Public Spending on Poor</td>
<td>Government Should Redistribute</td>
<td>Prefer Cut Debt by Spending Cuts (6)</td>
<td>Index of Preferences for Cut Spending (7)</td>
<td>County Property Tax Rate, 2010 (8)</td>
<td>Supports Opposes EPA Repealing 2000–16 (Avg.)</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td>(9)</td>
<td>(10)</td>
</tr>
<tr>
<td>frontier experience</td>
<td>0.224***</td>
<td>0.260***</td>
<td>0.021***</td>
<td>0.002</td>
<td>-0.027</td>
<td>0.010**</td>
<td>0.043*</td>
<td>-0.046***</td>
<td>0.012</td>
</tr>
<tr>
<td>(0.048)</td>
<td>(0.049)</td>
<td>(0.008)</td>
<td>(0.006)</td>
<td>(0.021)</td>
<td>(0.005)</td>
<td>(0.023)</td>
<td>(0.015)</td>
<td>(0.007)</td>
<td>(0.012)</td>
</tr>
<tr>
<td>KP Wald Statistic</td>
<td>103.5</td>
<td>103.5</td>
<td>31.2</td>
<td>45.2</td>
<td>103.5</td>
<td>34.1</td>
<td>34.2</td>
<td>103.5</td>
<td>103.5</td>
</tr>
<tr>
<td>Number of Individuals</td>
<td>2,035</td>
<td>2,035</td>
<td>95</td>
<td>1,722</td>
<td>52.2</td>
<td>33.4</td>
<td>57.9</td>
<td>39.2</td>
<td>29.432</td>
</tr>
<tr>
<td>Mean of Dependent Variable</td>
<td>0.00</td>
<td>0.00</td>
<td>0.402</td>
<td>0.00</td>
<td>0.434</td>
<td>0.00</td>
<td>1.02</td>
<td>535</td>
<td>0.317</td>
</tr>
</tbody>
</table>

Notes: This table reports instrumental variables estimates of equation (5) based on the Bartik (1991)-inspired instrument described in Section 6.1. We report results for several of the long-run outcomes in Tables 3–6 using the same specifications therein. Panel A reports the baseline IV estimates while Panel B reports estimates that additionally include a set of bad (i.e., not predetermined) controls: population density in 1890 and 2010, birthplace diversity (fractionalization) in 1870 and 2000, and the first year the county was connected to the railroad. The sample size is slightly reduced here due to coverage gaps in the 1870 Census. Results look similar in Panel A restricted to this smaller sample. The KP Wald Statistic is due to Kleibergen and Paap (2006). Given the large Wald stats, similar inference arises using weak-instrument robust estimators. Standard errors are clustered based on the arbitrary grid-cell approach of Bester et al. (2011) as detailed in Section 6.1. Significance levels: *: 10%  **: 5%  ***: 1%.
Table 8: Robustness to Additional Controls as Mediators of Main Outcomes

<table>
<thead>
<tr>
<th>Data Source:</th>
<th>1940 Top Census</th>
<th>ANES Unique Name Share</th>
<th>CCS Prefers Cut Public Spending</th>
<th>CCS Government Should Propound Spreading Cuts</th>
<th>CCS Prefers Cutting Spending</th>
<th>GSS Index of Preferences for Cutting Spending</th>
<th>ACS County Property Tax, 2010</th>
<th>Leip Republican Vote Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable:</td>
<td>Unique Name Share Boys</td>
<td>Prefers Cut Public Spending on Poor</td>
<td>Prefers Cut Public Spending on Welfare</td>
<td>Prefers Cutting Debt by Spreading Cuts</td>
<td>Prefers Cutting Spending</td>
<td>Index of Preferences for Cutting Spending</td>
<td>Property Tax Rate, 2010</td>
<td>Supports EPA Regulation of CO2</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel A: Baseline OLS Specifications from Tables 3–5 + Controls for Pop. Density in 1890/2010, Birthplace Diversity in 1870/2000, Year Connected to Rail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>frontier experience</td>
<td>0.065***</td>
<td>0.127***</td>
<td>0.013***</td>
<td>-0.0001</td>
<td>-0.023*</td>
<td>0.003</td>
<td>0.025</td>
<td>-0.002</td>
</tr>
<tr>
<td>(0.018)</td>
<td>(0.021)</td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.013)</td>
<td>(0.002)</td>
<td>(0.013)</td>
<td>(0.005)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Number of Individuals</td>
<td>–</td>
<td>–</td>
<td>2,188</td>
<td>26,577</td>
<td>8,466</td>
<td>169,020</td>
<td>5,382</td>
<td>–</td>
</tr>
<tr>
<td>Number of Counties</td>
<td>1,838</td>
<td>1,838</td>
<td>87</td>
<td>1,606</td>
<td>242</td>
<td>1,819</td>
<td>240</td>
<td>1,836</td>
</tr>
<tr>
<td>Panel B: Baseline IV Specifications from Tables 3–5 + Controls for Pop. Density in 1890/2010, Birthplace Diversity in 1870/2000, Year Connected to Rail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>frontier experience</td>
<td>0.159***</td>
<td>0.231***</td>
<td>0.016***</td>
<td>-0.002</td>
<td>0.018</td>
<td>0.004</td>
<td>0.031</td>
<td>-0.028*</td>
</tr>
<tr>
<td>(0.039)</td>
<td>(0.040)</td>
<td>(0.006)</td>
<td>(0.026)</td>
<td>(0.030)</td>
<td>(0.025)</td>
<td>(0.023)</td>
<td>(0.015)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>KP Wald Statistic</td>
<td>140.5</td>
<td>140.5</td>
<td>69.3</td>
<td>43.6</td>
<td>49.9</td>
<td>46.9</td>
<td>45.2</td>
<td>140.4</td>
</tr>
<tr>
<td>Number of Individuals</td>
<td>–</td>
<td>–</td>
<td>2,188</td>
<td>26,577</td>
<td>8,466</td>
<td>169,020</td>
<td>5,382</td>
<td>–</td>
</tr>
<tr>
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<td>1,606</td>
<td>242</td>
<td>1,819</td>
<td>240</td>
<td>1,836</td>
</tr>
<tr>
<td>Mean of Dependent Variable</td>
<td>0.00</td>
<td>0.00</td>
<td>0.090</td>
<td>0.402</td>
<td>0.434</td>
<td>0.00</td>
<td>1.02</td>
<td>0.535</td>
</tr>
<tr>
<td>Survey Wave Fixed Effects</td>
<td>–</td>
<td>–</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>–</td>
</tr>
<tr>
<td>Individual Demographic Controls</td>
<td>–</td>
<td>–</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>–</td>
</tr>
<tr>
<td>State/Division Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Geographic/Agroclimatic Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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