Identity, Parochial Institutions, and Career Decisions:
Linking the Past to the Present in the American Midwest *

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Abstract

This paper documents the presence of non-economic career motivations in the U.S. labor market, explores reasons why such motivations could arise, and provides an explanation for why they might have persisted across many generations. The analysis links ethnic (migrant) labor market networks in the American Midwest when it was first being settled, the local identity or attachment to place that emerged endogenously to maintain the integrity of these networks, and occupational choice today. While fractionalization may adversely affect the performance of secular institutions, ethnic competition in the labor market would at the same time have strengthened within-group loyalty and parochial institutions. These values and their complementary institutions, notably the church, could have mutually reinforced each other over many overlapping generations, long after the networks themselves had ceased to be salient. Counties with greater ethnic fractionalization in 1860 are indeed associated with steadily increasing participation in particular religious denominations historically dominated by the migrants all the way through the twentieth century. Complementing this result, individuals born in high fractionalization counties are significantly less likely to select into geographically mobile professional occupations and, hence, to migrate out of their county of birth, despite the fact that these counties are indistinguishable from low fractionalization counties in terms of local public good provision and economic activity today.


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1 Introduction

The textbook economic model assigns individuals to occupations on the basis of their ability, the opportunities they have to invest in human capital, and the types of jobs that are subsequently made available to them in the labor market. Outside of economics, social scientists have long argued that factors seemingly unrelated to economic incentives and constraints can also determine career choices. Weber’s (1930) writings on the Protestant ethos are the classic reference in this literature. More recently, sociologists have described how working class communities shape the aspirations their members (Gans 1962). Our objective in this paper is to document the presence of such non-economic career motivations in the U.S. labor market, explore the reasons why such motivations could arise, and understand why they might persist across many generations.

We start with the idea that social groups can endogenously instill values in their members that increase loyalty and reduce the propensity to exit, particularly when they are vulnerable to acculturation (Bisin and Verdier 2000) or in competition with other groups (Sumner 1906). The negative consequences of population heterogeneity, typically measured by fractionalization along various economic and social dimensions, are well documented in the economics literature. While ethnic or racial fractionalization may adversely affect the performance of secular institutions, we argue that such fractionalization can at the same time strengthen within-group loyalty and parochial institutions.

In the setting that we consider – the American Midwest – the labor market was the primary domain in which ethnic groups historically interacted. Migrant workers had to bear most of the fluctuations in labor demand in the early stages of industrialization in the United States (Hoerder 1991). This is precisely the situation in which labor market networks are most useful and there is a wealth of historical evidence documenting the role played by ethnic migrant networks in finding jobs for their members at this time. With the arrival of the railroads around 1850, the Midwest in particular witnessed a large influx of European migrants in response to the new occupational opportunities that became available. Historians describe the efforts made by migrant communities to establish “occupational beachheads” and “toe-holds” in new locations, and to subsequently work hard to maintain these positions once they were established. We will show that the cost to the network from the exit of one of its members and, hence, efforts to instill a sense of loyalty to the local community would have been greatest in fractionalized labor markets with many ethnic networks competing for coveted permanent jobs.

Alesina, Baqir, and Easterly (1999), for example, document the negative relationship between racial fractionalization and public good provision in the United States.
Once such a loyalty to the local community was instilled, how and why was it maintained over many
generations in the future? One institution that could have maintained local values from one generation
to the next is the family. Bisin, Topa, and Verdier (2004), for example, describe how parents in minority
communities in the United States socialize their children more strictly to prevent them from assimilating.
In the current context, however, it is not clear why parents acting on their own would place the welfare
of the community above their own children’s desire to be mobile. Given the high rates of inter-county
migration in the Midwest (close to 60 percent) that we document below, few families would have remained
in the same local area from the time of initial settlement in any case. A more promising mechanism relies
on the church to explain the persistence of local values. The migrant church was historically the focal
point for economic activity in the new community, providing a domain in which information could flow
and commitments could be enforced (Gjerde 1991). While all churches would have instilled denomination-
specific beliefs in their congregations, migrant churches in highly fractionalized labor markets should, in
addition, have put special effort into instilling a loyalty to the local community among their members.
It is the long-term effect of these efforts, within particular denominations historically dominated by the
migrants, that we attempt to identify in this paper.

Labor market networks and civic institutions organized around European origin-countries are largely
irrelevant in the Midwest today (Gans 1979, Alba 1990). However, it would be incorrect to assume
that these institutions disappeared without a trace. The church, in particular, remains at the center of
the typical Midwestern community, providing important forms of support for its members such as social
activity and assistance when they were sick or infirm (Elder and Conger 2000). Well-functioning churches
require loyal and committed members. If members’ inputs in the church are complements, as suggested by
Iannaccone (1998), and if there is sufficient overlap across generations, then the first-generation members
of well-functioning migrant churches, with a strong local loyalty, would have had a greater incentive
to instill this value in the generation that followed. This process could have repeated itself from one
generation to the next, in the church and the broader community that formed around it, linking initial
settlement patterns to a loyalty to place today.

Loyalty to place or local identity (Hunter 1975, Guerson, Stueve and Fischer 1977, Hummon 1990)
is well-described by the following quote from a resident of Bloomington, Indiana who moved to that city
to live with his wife who was born nearby, “... my chief ambition, I discovered during our early years
in Bloomington, was not to make a good career but to make a good life. And such a life as I came to
understand it, meant being a husband and a father first, and an employee second; it meant belonging to
a place rather than to a profession ... So as I came to recognize my children’s need and my own need for
a firm home place, I came to understand my community’s need for citizens who stay put. Most of what I
valued in Bloomington was the result of efforts by people who loved the place, either because they grew
up here and chose to stay, or because they landed here and chose to remain” (Sanders 2007: 67-68).

Two aspects of local identity emerge from the preceding quote. First, local identity is associated with
values that stress loyalty to a specific place. As in Akerlof and Kranton (2000), we expect that individuals
born and socialized in communities with a strong local identity will incur a particularly high utility cost
when they leave their communities. In the U.S. labor market, this implies that individuals endowed with
a strong sense of local identity will be less likely to choose professional occupations, which are associated
with significantly greater career-related moves than non-professional occupations. Second, we see that the
core value associated with local identity, notably a commitment to stay, must be shared by other members
of the community. Strong identity and tight-knit communities are mutually reinforcing and, as discussed
above, one cannot persist without the other (Bénabou and Tirole [2006] make the same argument to
explain the persistence of mutually reinforcing collective beliefs and political equilibria).

The homogenization of production that is characteristic of the Midwest only began around 1880.
Thus, between 1850 and 1880 there was a window of time during which this region was rapidly settled
and during which there was substantial fluctuation in labor market conditions and, hence, ethnic rivalry
across local areas. These initial conditions are crucial because once community institutions and a level of
individual commitment were established, these mutually reinforcing characteristics could have remained
in place over many generations in the future. We consequently exploit variation in initial conditions
within the Midwest to identify the effect of historical networks, and the identity and parochial institutions
they engendered, on career decisions and geographical mobility long after the networks themselves had
disappeared.

The framework we have outlined generates the prediction that counties with greater ethnic rivalry at
the time of settlement should be associated with stronger local identity and better functioning churches
in select denominations historically denominated by the migrants. This implies that individuals born in
those counties and belonging to those migrant denominations should be less likely to enter a more mobile
professional career today. Because occupational choice and religious affiliation are jointly determined, we
cannot estimate the effect of historical fractionalization on current career decisions separately for members
of migrant and non-migrant denominations. What we do instead is to test the implied hypotheses that
(i) higher fractionalization should be associated with a lower supply of professionals and lower mobility
on average in the county, and (ii) that higher fractionalization should be associated with greater church participation in select migrant denominations alone.

To test the first hypothesis we combine data from the U.S. census and the National Longitudinal Survey of Youth 1979 (NLSY79). A major advantage of situating the analysis in the Midwest is that individual level data on occupations and ethnicity can be obtained from the census going back to the time when this region was starting to develop. We focus on the 1860 census when rapid growth was just commencing and construct a measure of ethnic fractionalization, one minus the Herfindahl concentration index, within each broad occupational category in each county in that census year. Averaging over all occupational categories in each county we arrive at a measure of ethnic fractionalization in 1860 that is positively correlated with ethnic rivalry in the labor market at that time and, hence, with the strength of local identity in the county as it subsequently emerged. Matching the county-level measure of ethnic fractionalization with individual data from the NLSY79, we find that individuals born in high fractionalization counties are significantly less likely to be employed in professional occupations and are significantly less likely to have migrated out of their birth county in 2000.

The values that we believe are responsible for the career choices described above could not have persisted in a local community over so many generations without institutional support. The second testable hypothesis is that high fractionalization counties should have been associated with better functioning migrant churches and related parochial institutions. If these institutional features persisted over time, supporting and being supported by local identity, then we would expect to see greater participation in religious denominations that were historically dominated by migrants, notably the Lutherans and the Catholics, today. Using data from the Census of Religious Bodies, available at roughly ten-year intervals from 1860 to 2000, we successfully verify this important prediction. The share of Lutherans and Catholics in the population is significantly larger in high fractionalization counties by 1870 and, most importantly, this gap grows steadily wider over the course of the twentieth century. In contrast, participation in other denominations is slightly lower in the high fractionalization counties over the entire period. We verify that these cross-denominational patterns in religious participation hold up with the NLSY data as well.

Our interpretation of the results described above is that local institutions and individual values, determined endogenously by the labor market when the Midwest was first being settled in 1860, have subsequently persisted over time and continue to shape career decisions one hundred and forty years later. Alternative explanations assume that the ability endowment in the population, investments in human capital, or access to particular types of jobs today vary with fractionalization in 1860. For example,
although ethnic networks and specific European ancestry are no longer directly relevant in the Midwest economy, ethnic fractionalization in 1860 could potentially be correlated with particular features of the economy at that time, which had persistent effects and determine the demand for professional labor today. Similarly, the well documented negative correlation between fractionalization and public good provision could have given rise to poorly functioning schools in high fractionalization counties.

We later show that if identity is salient and the demand for professional labor is uncorrelated with historical fractionalization, then high fractionalization counties will supply too few professionals and too many non-professionals as long as there is ex ante uncertainty in the demand for different types of jobs. Professional labor must move into these counties and non-professional labor must move out of them ex post in competitive equilibrium. It follows that individuals residing in high fractionalization counties will be just as likely to hold professional jobs as individuals residing in low fractionalization counties, once the labor market clears. It is only individuals born in high fractionalization counties who should be less likely to be professionals. The alternative hypothesis, based on differences in the demand for professional labor across counties, predicts that individuals born and residing in high fractionalization counties should be less likely to be professionals. We verify that adult workers residing in high fractionalization counties are indeed as likely to be professionals as those residing in low fractionalization counties, ruling out the most obvious alternative explanation for our results.

Our results could also be obtained if the incoming migrants in the high fractionalization counties had lower ability, and this ability differential persisted across generations. Human capital transmission is less of a concern with our analysis since we are going back at least five generations; even if the ability distribution of the incoming migrants varied systematically with fractionalization in 1860, this heterogeneity would have long since disappeared, given the high rates of inter-county migration in the Midwest. A more relevant concern is that fractionalization at the time of initial settlement could be correlated with social heterogeneity many decades later in the twentieth century when the secondary school system was being established in the Midwest. Goldin and Katz (1999) document a negative relationship between social

\footnote{The empirical strategy that we employ is related to the strategy adopted by Fernandez and Fogli (2007) in a very interesting recent paper. Fernandez and Fogli establish that female labor force participation in the origin country affects labor force participation and fertility rates among second-generation female migrants in the United States. They rely on the assumption that cultural traits will be transmitted across space and so cultural heterogeneity will continue to manifest itself in an economic environment – the U.S. labor market – that does not distinguish between social groups. The obvious alternative explanation, which they take care to rule out, is that human capital rather than culture is being transmitted across generations. With our strategy, the chief concern is that there is something about the place, other than identity and its complementary institutions, that has persisted over time, which the preceding test on the county of residence, rather than the county of birth, helps rule out.}
heterogeneity and early investments in higher education. At the same time, they show that greater church participation was associated with larger investments in human capital, and so the net effect of 1860 fractionalization on education expenditures is ambiguous. The NLSY provides information on AFQT scores and educational attainment. Information on local public good provision, including education expenditures, can also be obtained at the county level in 1990. Reassuringly, we find no relationship between historical fractionalization and current investments in schooling or educational attainment. The only exception is that individuals born in high fractionalization counties are significantly more likely to choose college majors that lead to less mobile careers.

This paper makes a contribution to the rapidly expanding literature on culture and religion in economics as well as a more established literature on institutions. While the literature on religion has tended to focus on beliefs or ideologies and their effect on individual behavior and aggregate outcomes (Barro and McCleary 2003, Bénabou and Tirole 2006), we model the church as a collective institution that was fortuitously well-positioned to reduce coordination and commitment problems historically and which continues to play that role today. Instead of focusing on differences in occupational choice and mobility across denominations or between church participants and non-participants, we study how local economic conditions shaped the orientation of individual churches within particular migrant denominations. Our analysis thus provides empirical support for Greif’s (2006) view that institutions cannot be simply described by a set of formal rules, but are in fact more complex arrangements whose formation and evolution are determined by history and context. Finally, this paper complements recent research that investigate the relationship between culture and growth (Barro and McCleary 2003, Tabellini 2005, Fernandez and Fogli 2007, Guiso, Sapienza, and Zingales 2008). Although local identity cannot be observed directly, our analysis goes beyond previous studies to theoretically and empirically describe the formation and the persistence of this particular cultural trait. This trait is seen to have a large effect on important economic decisions in a region as homogeneous as the American Midwest, long after the forces that gave rise to it had ceased to be salient, providing evidence for a role for culture that is not subject to the usual

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3Guiso, Sapienza, and Zingales’ (GSZ’s) fascinating study testing Putnam’s conjecture that political independence fosters social capital is one exception. GSZ find that political independence in their sample of Italian cities 500 years ago is a strong predictor of social capital and income today, despite the fact that these early political institutions have long since disappeared. While the church may be responsible for the transmission of values in our Midwestern setting, GSZ argue that the family would have played that role in Italy. Despite these contextual differences, the basic approach in the two papers is the same, starting with the endogenous formation of a particular cultural trait and then documenting its effect on important decisions and outcomes long after the forces that gave rise to it had ceased to be relevant. The advantage of working with U.S. data is that we can trace church participation over the entire 140-year period under study and then use high-quality individual data, with information on both the county of birth and the county of residence, to document the effects we are interested in and to rule out the most obvious alternative explanations.
critiques of cross-country or cross-regional analyses.

2 The Institutional Setting

2.1 The Settling of the Midwest

The Midwest first began to be settled in the early nineteenth century with the expansion of the national canal system. The Erie Canal linking the Hudson to Lake Erie was completed in 1825 and numerous inter-regional and intra-regional canals were built over the next two decades (Fishlow 2000). However, it was only with the arrival of the railroad that the Midwest took off on a steeper growth trajectory. Before 1850 the Midwest had less than one thousand miles of track, but almost ten thousand were added by 1857 (Meyer 1989).

Improved rail transportation stimulated industrialization and the Midwest’s share of national manufacturing increased rapidly between 1860 and 1920, with almost half of this increase occurring in the 1860’s (Meyer 1989). This increase in economic activity led, in turn, to an increase in the demand for labor. In 1810, approximately 6 percent of the labor force (outside the southern states) resided in the Midwest. By 1860, this share had increased to 41 percent, with a further increase to 51 percent by 1880, after which regional growth converged to the national average (Margo 1999). In this paper, the Midwest is comprised of the states of Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin (Missouri, the only pre-Civil War slave state in the Midwest, is excluded from the analysis). Using county-level census data we see that the number of incorporated counties increases sharply from 1850 to 1860 and then flattens out by 1880 in Figure 1. Information on railroads, obtained from the Historical Map Archive at the University of Alabama, indicates that the number of these counties with a railroad also increases steeply over the 1850-1870 period, growing thereafter at a slower rate. The rapid expansion of the railroad system and the economic activity that accompanied it led to a steep increase in the population of the Midwest as well as an influx of foreign migrants. Using county-level census statistics, the total population in our seven Midwestern states grew from less than 5 million in 1850 to 20 million in 1900. The number of foreign-born migrants nearly tripled between 1850 and 1860, reaching close to 20 percent of the population.

Where did these migrants come from? Individual-level data, including characteristics such as age, sex,

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4Railroad maps were used to construct a county-level binary variable indicating whether any part of a railroad ran through the county in a given year. Railroad maps were unavailable in some census years in which case we used maps that were closest in vintage to those census years (the discrepancy never exceeded three years).
occupation, and country of birth, are publicly available from the Population Census each decade from 1850 to 1930. We use the 1-in-100 sample from the 1860-1900 IPUMS to study changes in the migrant population in these critical early decades in Table 1. The English (13 percent), the Irish (25 percent), and the Germans (32 percent), dominated the migrant population in the Midwest in 1860, just after the first wave of migration described above, with no other ethnic group accounting for more than a 3 percent share of the migrants in that year. Subsequently, the English and the Irish were displaced by the Germans and the Scandinavians over the 1860-1900 period. Notice that the Italians, Poles, and Slavs continue to be insignificant in 1900, although they would display a substantial presence in Midwestern cities such as Cleveland, Chicago, and Pittsburgh by the first quarter of the twentieth century.

What jobs did the migrants occupy? Table 2 reports the occupational distribution of the migrants from the IPUMS sample in 1860, 1880, and 1900. Although agriculture was the dominant sector in this period, the share of farm employment declines from 62 percent in 1860 to 48 percent in 1900, with manufacturing operatives and laborers accounting for much of the increase in non-farm employment. These trends are consistent with the growth of the manufacturing sector described above and they are similar for the foreign-born migrants and the native workers (not reported).

The apparent similarity in the occupational distribution for migrants and natives masks differences in the type of jobs they had access to within each occupational category. Labor markets in the nineteenth century could be divided into three segments: a stable segment with permanent employment, an unstable segment with periodic short-term unemployment, and a marginal but highly flexible segment characterized by spells of long-term and short-term employment (Gordon, Edwards, Reich 1982). Migrants being newcomers to the U.S. market typically ended up in the unstable and marginal segments, where the uncertain labor demand naturally provided an impetus for the formation of ethnic networks that helped their members find jobs (Hoerder 1991). Based on the discussion above and Figure 1, we would expect these networks to have been particularly important during the rapid expansion phase around 1860, with the influx of migrants and the opening up of new labor markets in both agriculture and manufacturing. The initial conditions in the empirical analysis, measuring ethnic rivalry in the labor market at the time of settlement, will consequently be measured using data at this point in time. Although not reported, regressions that treat 1850 as the starting point provide qualitatively similar results.
2.2 Ethnic Labor Networks in the Midwest

Accounts by contemporary observers and a rich social history literature indicate that friends and kin from the origin community in Europe played an important role in securing jobs for migrants in the Midwest in the nineteenth century and the first quarter of the twentieth century. Early historical studies used census data, which provides fairly detailed occupational and ethnic information, to identify ethnic clusters in particular locations and occupations. Gordon, Edwards, and Reich (1982) note that although foreign-born workers comprised just over 20 percent of the labor force in 1870, they accounted for 43 percent of the iron and steel operatives, 43 percent of the woolen mill workers, and 63 percent of the miners. Nearly a quarter of railroad workers were Irish, a third of the miners were British, and about half the workers in the baking and confectionary business were German. While such clustering suggests that underlying ethnic networks were channeling their members into particular occupations, it could simply reflect the fact that migrants arrived with specific skills. Hutchinson’s (1956) analysis of 1950 census data, however, indicates that clustering continued even among the migrants’ children, with the concentration of particular ethnic groups in some industries actually increasing from the first to the second generation.

Although census data are a useful source of information, they do not provide details of the migration process and its connection to ethnic networks in the United States. Over the past four decades, however, social historians have linked parish registers and county data in specific European sending communities to census and church records in the United States to construct the entire chain of migration from those communities as it unfolded over time. This remarkable research effort has documented the formation of new settlements in the Midwest by pioneering migrants, the subsequent channelling of migrants from the origin community in Europe to these settlements, as well as the movement of groups from the original settlement to new satellite colonies elsewhere in the United States. As with the census data, this research identifies occupational and geographic clustering, but at a disaggregate level. Over 45 percent of the Swedish emigrants from the parish of Rätvik eventually settled in Isanti County, Minnesota (Ostergren 1976). Two-thirds of the emigrants from Balestrand located in Norway Grove, Wisconsin in the first decade of migration from that Norwegian community (Gjerde 1985). And one-third to one-half of the German emigrants from Westerkappeln settled in Duden County, Missouri (Kamphoefner 1987). Although less detailed origin-country information is available for southern European migrants, similar ethnic clustering in particular neighborhoods of Midwestern cities has been documented for Polish, Italian, and Slovak immigrants from specific sending regions (Alexander 1991, Bodnar, Simon, and Weber 1982).
A possibly stronger indicator of the importance of migrant networks is the maintenance of ethnic ties over successive moves within the United States. Italians moved from Southern Illinois to the “Italian Hill” in St. Louis when coal mining operations were reduced in the 1920’s and Slavs moved from mines in Western Pennsylvania to Detroit’s growing automobile industry in the same decade (Bodnar 1985). Norwegians from Balestrand initially settled in Norway Grove, Wisconsin, but over time they established six satellite settlements in Wisconsin, Minnesota, Iowa, and Illinois (Gjerde 1985). A similar pattern has been documented for Norwegians immigrants from Fortun, who initially settled in Vernon and Crawford Counties, Missouri, but later established satellite communities throughout the Midwest (Gjerde 1997).

While the preceding descriptions of ethnic clustering are informative, ethnic concentration within specific departments or firms in a local industry provides possibly the strongest evidence that labor networks were active. Nearly all three thousand employees of the Peninsular Gas Company in Detroit in 1900 were Polish, and Croatians held only three jobs in Indiana’s oil refineries: stillman helper, fireman, and still cleaner (Bodnar 1985). Italians in Pittsburgh’s steel industry dominated the carpentry, repair, and rail shops. And, relying on friends and relatives, Poles established occupational niches at the Jones and Laughlin and Oliver Mills on Pittsburgh’s Southside, Heppenstalls and the Pennsylvania Railroad in Lawrenceville, and at the Armstrong Cork Company and the H.J. Heinz Plant. As John K. a Polish immigrant put it, “The only way you got a job [was] through somebody at work who got you in” (Bodnar, Simon, and Weber 1982: 56).

What kept ethnic networks in place so far from their origin locations? It has been argued that “[migrants] from varying regions [in the origin country] formed a community based on common nationality and religion centered on the central cultural institution – the church” (Gjerde 1991: 176). The building of a church was one of the first organized actions in the migrant community once it arrived in an area (Barton 1975, Bodnar, Simon, and Weber 1982). Churches provided both economic and social support to their members. Information about jobs and potential land transactions flowed within the congregation and the church also served as a public arena in which members who had reneged on their obligations could be sanctioned.

Given the variety of economic opportunities in the United States, individuals and small groups drawn from the same parish in Europe often had an incentive to move and seek employment elsewhere. The stability of the local community in the United States, based on a common national origin rather than narrower social affiliations, was thus essential for the viability of the labor market network. One strategy to maintain stability would have been to instill a sense of loyalty to this community. The discussion that
follows will describe how efforts to engender a sense of local identity by the church and the institutions that formed around it might have varied across Midwestern counties when the first wave of migrants arrived in the region.

2.3 Ethnic Fractionalization Across the Midwest

“You take in the erection department – it was mostly all Slavs ... Not Slovaks, it was Polish ... We didn’t have Lithuanians there and the Russians were not involved there ... Now if a Russian got his job in a shear department ... he’s looking for a buddy, a Russian buddy. He’s not going to look for a Croatian buddy. And if he see the boss looking for a man he says, ‘Look, I have a good man,’ and he’s picking out his friends.” (Polish immigrant in Pittsburgh, quoted in Bodnar, Simon, and Weber 1982:62).

Numerous historians have described the efforts made by ethnic groups to establish a “toe-hold” (Thistlethwaite 1991) or a “beachhead” (Bodnar, Simon, and Weber 1982) in particular industries or establishments when they first settled in an area. The preceding quote suggests, in addition, that once a network had established a presence in the labor market, it was essential to maintain that presence.

The discussion that follows will describe the labor market conditions under which migrant communities would have had the greatest incentive to restrict exit and, hence, instill a sense of local identity among their members. An explanation for the persistence of this identity over multiple generations, based on the complementary role of the church and other related institutions, is postponed to the next section.

Consider a market with $N$ migrant workers drawn from $M$ communities. The number of workers in each community is exogenously determined and we do not require the labor market to be in equilibrium. The workers are competing for a fixed number of coveted permanent jobs, which provide a total surplus $R$. Tullock’s (1980) canonical model of rent seeking can be conveniently adapted to this setting to describe the share of total surplus captured by community $i$

$$S_i = \frac{n_i^\alpha}{n_i^\alpha + \sum_{j=1}^{M-1} n_j^\alpha}$$

where $n_i$ is the number of workers belonging to community $i$, $n_j$ is the corresponding number of workers from each community $j \neq i$, and $\alpha > 0$.\(^5\) The cost to community $i$ from the exit of of its members at the margin can be described by the expression

$$R \frac{dS_i}{dn_i} = R \frac{\alpha n_i^{\alpha-1} \sum_{j=1}^{M-1} n_j^\alpha}{(n_i^\alpha + \sum_{j=1}^{M-1} n_j^\alpha)^2}.$$

\(^5\)Tullock’s specification is identical to the equation above except that the number of workers is replaced by the investment in rent seeking.
Assuming that all networks are of equal size, \( n_i = n_j = N/M \),

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R \frac{dS_i}{dn_i} = \frac{R\alpha}{N} \left(1 - \frac{1}{M}\right),
\]

which is increasing in \( M \). Holding \( N \) and \( R \) constant, an increase in the number of communities is associated with a greater marginal cost of exit regardless of whether the returns to network size are increasing (\( \alpha > 1 \)) or decreasing (\( \alpha < 1 \)) at the margin. Self-interested individuals do not internalize the cost imposed on the rest of the network by their exit. It follows that communities in labor markets with greater ethnic competition should have invested more in instilling a sense of local identity as a way of aligning individual incentives more closely with the community’s welfare.

Because networks vary in size in practice, we use a standard measure of fractionalization, defined as one minus the Herfindahl index of ethnic concentration, to measure competition.\(^6\) Following the discussion above, we assume that networks were most active in the migrant population and that they were organized around the country of origin. These ethnic networks would have competed directly with each other within (broad) occupational categories. The IPUMS provides the country of birth and the occupation (where relevant) for each sampled individual. Using these data, we compute ethnic fractionalization within the occupational categories specified in Table 2 in each Midwest county in 1860. The weighted average of the occupation-specific statistics, where the weight is measured by the share of migrants in the occupation, then provides us with an overall measure of ethnic fractionalization in the county. For example, suppose that there are two occupations and two ethnicities in the county, with complete occupational segregation along ethnic lines. Our measure of fractionalization will be zero in this case, correctly reflecting the absence of ethnic competition in this labor market. In contrast, if the two ethnicities are of equal size and evenly distributed across the two occupations, our measure of fractionalization will increase to 0.5. Figure 2 plots the fractionalization measure, which has a mean of 0.5 and a standard deviation of 0.2, across the seven Midwest states. Counties that were not incorporated and those without foreign-born migrants in 1860 are unshaded in the Figure. Notice that there is substantial variation in the fractionalization measure, which is useful for the statistical tests that follow.

While we focus on the effect of ethnic fractionalization in strengthening within-group solidarity, fractionalization could at the same time undermine the functioning of secular institutions. An important

\(^6\)The Herfindahl index of ethnic concentration is computed as the sum of the squared share of each ethnicity in the occupational category. It is easy to verify that for the special case with networks of equal size, the fractionalization measure is equal to \( 1 - N^2/M \), which is increasing in the number of communities \( M \), for a given number of migrant workers \( N \), as above.
advantage of using the Midwest for the analysis is that this region was settled recently enough that accurate measures of ethnic rivalry can be constructed with census data. At the same time, public services were provided at a rudimentary level in 1860 and the first investments in secondary schooling, for example, occurred more than 50 years later (Goldin and Katz 1999). While initial conditions may have determined subsequent labor in-flows and social heterogeneity, it is possible that the relevant determinants of public good provision many decades later in the twentieth century were largely unrelated to fractionalization in 1860. We will later verify that 1860 fractionalization is indeed uncorrelated with local public good provision, including education expenditures, in 1990. The major long-term effect of 1860 fractionalization seems to have been to shape the orientation of a particular set of parochial institutions that started to be established around that time.

2.4 Historical Fractionalization and Current Economic Conditions

To test the hypothesis that local identity and its complementary parochial institutions shape career choices, historical fractionalization must be uncorrelated with the demand for professionals, intrinsic ability in the population, and local public good provision today. We show in this section that ethnic fractionalization in 1860 is uncorrelated with measures of economic activity, racial and ethnic fractionalization, and expenditures on local public goods in 1990 once we control for a few important characteristics of the 1860 economy. More stringent tests ruling out a link between 1860 fractionalization and current economic conditions are discussed in Section 5.

Labor market networks organized around the European-origin countries in Table 2 are no longer active in the American Midwest. Nevertheless, fractionalization in 1860 could have been correlated with particular features of the economy at the time of initial settlement that had persistent effects. To explore this possibility, we proceed to understand what determined fractionalization in the first place. In a rapidly expanding Midwest economy, some of the variation in fractionalization across counties was no doubt a consequence of accidental initial settlement by ethnic groups in particular locations, which fueled the arrival of more migrants as networks crystallized. At the same time, fractionalization would have been determined by the demand for labor, with more ethnic groups attracted to rapidly growing areas. We have already discussed the importance of transportation links in the development of the Midwest and Table 3 consequently investigates the effect of railroads and distance to canals and a Great Lakes harbor on fractionalization in 1860.\footnote{Data on the distance to the nearest canal (or navigable river) and the nearest Great Lakes harbor is obtained from}
to a canal or harbor have significantly higher fractionalization in Table 3, Column 1. Counties close to a harbor had a greater proportion of the workforce engaged in manufacturing and a smaller proportion in agriculture in 1860 in Table 3, Columns 2-3. Improved transportation, more generally, is associated with a larger population in 1860 in Column 4.

Notice that the pattern of coefficients in Table 3, Column 1 with fractionalization as the dependent variable matches perfectly with the corresponding pattern in Column 4 with county population as the dependent variable. Counties with superior transportation infrastructure, which were more populated and presumably growing more rapidly, were more fractionalized in 1860. The population of the county in 1860 could have determined subsequent agglomeration in economic activity, with long-term implications for the growth of the local economy. Not surprisingly, we see in Table 4, Columns 1-3 that while 1860 fractionalization has an insignificant effect on 1990 agriculture share and manufacturing share, it is significantly and positively associated with current county population as well as population density (not reported). More urban counties will be more racially diverse, and it follows that 1860 fractionalization is significantly and positively correlated with racial fractionalization in 1990 in Column 4. In contrast, 1860 fractionalization is completely uncorrelated with (white) ethnic fractionalization in Column 5, consistent with the idea that few individuals living in the Midwest today could trace an unbroken line of descent to European ancestors arriving in the same county at the time of initial settlement.

We expect the fractionalization effect to disappear once important features of the local economy that would directly determine economic activity today, such as manufacturing share, agriculture share, and particularly population in 1860, are accounted for. The fractionalization coefficient is indeed small and insignificant in Columns 7-11 of Table 4, once the county controls are included. In contrast, agricultural counties in 1860 continue to be agricultural in 1990 and more populated counties in 1860 remain larger in 1990. Notice, however, that manufacturing in 1860 does not have a persistent effect. Although the factory system began to replace artisan shops by 1820, production continued to be largely organized in workshops managed by labor contractors who hired their own employees until 1870 (Gordon, Edwards, and Jordan Rappaport’s website at the Kansas City Federal Reserve Bank. The distance is computed in each case from the county centroid.

The manufacturing share in 1990 is defined as the share of the civilian labor force employed in manufacturing in that year. The agriculture share in 1990 is computed using the farm population and the total population in the county in that year. All these statistics, as well as the area of each county used to compute the population density, are obtained from the 1994 County Data Book, compiled by the U.S. Bureau of the Census. Racial fractionalization is computed from the 1990 IPUMS as one minus the Herfindahl index of racial concentration, using the same five racial groups as in Alesina, Baqir, and Hoxby (2004). Ethnic fractionalization is computed from the 1990 IPUMS as one minus the Herfindahl index of racial concentration, using the same 16 white ethnic groups as in Alesina, Baqir, and Hoxby.
Reich 1982). The heavy manufacturing that characterized the Midwest economy in the twentieth century, with its emphasis on the iron and steel industry, only came at the turn of the century (Meyer 1989). Recently it has been argued that the surge of foreign immigration in the second half of the nineteenth century provided the impetus for the factory system and the subsequent industrialization of the Midwest (Kim 2007). Whatever the explanation, it is clear that the pattern of manufacturing around 1860, spread throughout the Midwest in small towns, had little connection with the heavy manufacturing, concentrated in large cities, that followed in the twentieth century. This is presumably why 1860 characteristics have such little power in predicting the share of manufacturing in the county in 1990.

For our purpose, what is important is that once we control for a few features of the nineteenth century economy, fractionalization in 1860 has no effect on characteristics of the economy today, such as the share of manufacturing and urbanization (measured by total population or by population density), that are associated with the demand for professional labor. All of the results that follow will consequently condition for these important features of the 1860 economy. We will verify that all the results hold up without the 1860 controls as well. Finally, notice that more ethnically fractionalized counties in 1860 have significantly lower religious fractionalization in 1990, with and without the controls in Column 6 and Column 12. This intriguing result, which stands conspicuously apart from the other regressions reported in Table 4 will be clarified in the discussion on the church and the persistence of identity that follows in Section 3.

We complete this section by describing the relationship between local public good provision in 1990 and ethnic fractionalization in 1860 in Table 5. Local government expenditures per capita in 1990 are regressed on ethnic fractionalization, manufacturing share, agriculture share, and county population in 1860 in Column 1. Retaining the same set of regressors, the dependent variable is the share of expenditure allocated to education, health, police, roads, and welfare in Columns 2-6. The expenditure shares for these five public goods add up to 0.79, with the education share being as large as 0.6. The other shares range from 0.03 to 0.07. Given that the standard deviation of the fractionalization variable is 0.2, it is evident from the point estimates that 1860 fractionalization has a negligible effect on public good provision today. Using the same shares, Alesina, Baqir, and Easterly (1999) document a negative and significant relationship between contemporaneous racial fractionalization and the allocation of resources to

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9 Religious fractionalization is computed from the 1990 Census of Religious Bodies as one minus the Herfindahl index of religious concentration, using the same 18 religious denominations as in Alesina, Baqir, and Hoxby (2004).

10 These data are obtained from the Annual Survey of Governments, 1990. Alesina, Baqir, and Easterly (1999) use data drawn from the same source.
certain public goods, particularly education, roads, and welfare. We have already shown that 1860 ethnic fractionalization is uncorrelated with 1990 racial fractionalization in Table 4, and not surprisingly we see in Table 5 that historical ethnic fractionalization has no effect on current local public good provision, including education expenditures.

3 The Church and the Persistence of Identity

In a recent paper, Akerlof and Kranton (2005) describe how firms and other economic organizations can instill a sense of identity or loyalty among their workers to solve agency problems. In our setting, the natural organization to instill loyalty in the community would have been the local church. The church was among the first institutions to be established when immigrants arrived in an area (Hoerder 1991, Barton 1975, Bodnar, Simon, and Weber 1982). The church congregation provided many forms of mutual assistance including credit, insurance, job referrals, business information, and social support (Gjerde 1985, 1997, Alexander 1991). Indeed, it has been argued that immigrants participated in church communities to benefit from these economic and social services, instead of being drawn to the church by a particular belief or ideology (Bodnar 1985).

Despite these material attractions, exit from the local church and labor market was always a threat in nineteenth century America, especially in areas that had been recently settled. Migration to the United States, and subsequent internal migration, was typically organized around small groups drawn from the same parish or province in Europe. These groups were too small to maintain a viable church congregation and labor network when they first arrived in an area and so migrant churches in the Midwest typically brought together many regional groups with the same national origin. Inter-regional conflict was common, and there was always the possibility that groups within the church would move again to take advantage of new opportunities that became available elsewhere (Gjerde 1997). Under these circumstances, the migrant church had two distinct objectives: (i) to instill denomination-specific beliefs in the congregation, and (ii) to instill a loyalty to the local community that transcended narrower social affiliations. We saw earlier that the negative externality associated with individual exit was greatest in ethnically fractionalized labor markets. This implies that migrant churches should have made a special effort to instill a sense of local identity in such markets. In contrast, we have no prediction for the effect of fractionalization on the orientation of churches belonging to non-migrant denominations.

If local identity played a role in reducing exit in the nineteenth century, how and why did it persist
long after the ethnic labor networks it supported ceased to be salient? Our explanation for this persistence
is based on the observation that churches continue to provide important forms of social support to their
members. Church activities include Sunday school service, youth groups, pot-lucks, informal home parties,
and food, visits, and other forms of support when members of the congregation are ailing or infirm. The
church also lies at the center of a cluster of inter-linked civic institutions, including the school and various
voluntary organizations. Life in a Midwest community revolves around these institutions, which bring
families, friends, and multiple generations together on a regular basis (Elder and Conger 2000). We
focus on the church in the analysis that follows because of its central social position and because church
participation is available at the county level, by denomination, from 1860 till 2000.\textsuperscript{11}

There are complementarities associated with church inputs; if the rest of the congregation commits
time and effort to the church, then the returns to the individual’s inputs would increase as well (Iannaccone
1998). The presence of these complementarities introduces two problems. First, self-interested individuals
will devote a level of inputs that is sub-optimal because they do not internalize the benefits that the rest
of the congregation derives from their actions. Second, a coordination problem can arise since individuals
will only make career choices that are associated with a high level of commitment to the church if they
expect other members of their generation, who are simultaneously making these choices, to do likewise.
A strong sense of local identity reduces each of these problems, serving as a commitment device and
increasing the level of church inputs in equilibrium. Given that church inputs are complements and that
generations overlap, it is easy to verify that the first generation in a migrant church with a committed
congregation would have been more willing to bear the cost of instilling a strong sense of local identity in
the generation that followed. Local identity and church inputs could have subsequently reinforced each
other in this way over many overlapping generations.\textsuperscript{12}

\textsuperscript{11}The number of civic and social associations in the county and the corresponding number of religious organizations can be
obtained from the County Business Patterns, 1990. The number of not-for-profit organizations in the county can be obtained
from National Center for Charitable Statistics Core Files, 1990. Controlling for manufacturing share, agriculture share,
and county population in 1860, ethnic fractionalization in that year has no effect on any of these variables. Note, however,
that these statistics are based on the number of organizations, whereas what we require are measures of participation. For
example, we will see below that 1860 fractionalization has a significant and positive effect on religious participation in 1990
despite the fact that it is uncorrelated with the number of religious organizations.

\textsuperscript{12}The persistence in local identity that we describe is related to a paper by Bénabou and Tirole (2006) linking investments
in human capital at the household level with the political equilibrium at the macro level. In their model, children choose a
level of effort (schooling) based on their belief about the returns to this effort. If a sufficiently large number of households
invest in effort, they will form a pivotal voting block and set a low tax rate, generating, in turn, a high return to effort that
reinforces the initial beliefs. Thus, two political equilibria can arise: a low-effort equilibrium with substantial redistribution
(high taxes) and a high-effort equilibrium with little redistribution (low taxes). Bénabou and Tirole fix the equilibrium
by assuming that children have imperfect willpower and so will underinvest in effort if left to themselves. Their parents,
who provide them with information about the returns to effort, will consequently systematically inflate these returns. This
“ideological” position leads parents in the high-effort equilibrium to (optimally) ignore negative signals about the returns to
Local identity and church inputs cannot be observed directly. However, both the Census of Religious Bodies (CRB) and the NLSY provide information on the number of church participants. The preceding discussion indicates that migrant churches in high fractionalization counties should have been relatively well-functioning, with a high level of church inputs, at the time of initial settlement and over many future generations. These churches would, in turn, have attracted more members and supported higher rates of attendance in the congregation. Restricting attention to denominations historically dominated by the migrants, the testable prediction is that high fractionalization counties should be associated with greater church participation overall. Moreover, the effect of fractionalization on church participation must be sustained over time, reflecting the underlying role of the church in maintaining local identity. This prediction distinguishes our model, with identity as a commitment device, from the model of religious cults proposed by Iannaccone (1992) in which self-sacrifice and strict norms of behavior are used to screen out free-riders and ensure higher levels of participation among those that remain. While this alternative mechanism may induce high levels of participation at the intensive margin, it results in small congregations and is typically short-lived.

Based on the country of origin of the incoming migrants, reported in Table 1, most of the migrant churches would have been Lutheran or Catholic. Regressing the population-share of different denominations, computed with data from the CRB in 1860, on the share of migrants in that year, counties with a greater share of migrants are indeed disproportionately Lutheran and Catholic. A strong test of our framework is that the predictions derived above should apply to those migrant denominations only. In particular, higher fractionalization counties should be associated with a greater share of participating Lutherans and Catholics in the population around the time of initial settlement and this effect of fractionalization should be sustained over time. In contrast, the model has no prediction for the relationship between fractionalization and participation in other denominations, providing us with a useful falsification test.

The relationship between ethnic fractionalization and religious participation can be tested with data from the CRB, which has been conducted at roughly ten-year intervals from 1860 to 2000. This census effort, allowing particular equilibria and the collective beliefs that support them to persist over many generations. In this paper we use local identity rather than ideology to fix the level of church inputs and sustain a social equilibrium over many generations.

Apart from the Germans and the Irish, the English were also an important migrant group in 1860. The English would have been disproportionately Anglican (Episcopalian). This denomination accounts for just 3 percent of church participants in 1860 and is never a significant force in the Midwest. Inclusion of the Episcopalians among the migrant denominations, not surprisingly, has little effect on the religious participation results reported below.
was conducted as part of the population census from 1860 to 1890, with census enumerators collecting information from individual churches in each county. Subsequently, the U.S. Bureau of the Census conducted the CRB separately from the population census in 1906, 1916, 1926, and 1936. Starting from 1952, the National Council of Churches of Christ undertook the responsibility of conducting the CRB, with subsequent census rounds in 1972, 1980, 1990 and 2000.

The 1860-1890 census rounds collected information on the number of church seats by denomination in each county. From 1890 onwards, information was collected on the number of members directly, and from 1972 onwards the number of adherents was collected as well. Despite these changes in the management of the CRB and the measure of religious participation, we uncover clear changes in the mix of denominations as well as the effect of 1860 fractionalization on religious participation over time.

Table 6 reports changes in the mix of denominations and overall participation rates in our Midwestern counties over the 1860-2000 period. To take account of the fact that the measure of participation was changing over time, we report statistics in the first and the last census-year that each measure was used. Thus, participation is measured by the number of church seats from 1860 to 1890, by the number of members from 1890 to 1952, and by the number of adherents from 1972 to 2000.\textsuperscript{14} The participation rate is then computed as the number of participants divided by the contemporaneous population in the county. Five denominations – Baptist, Catholic, Lutheran, Methodist, and Presbyterian – account for roughly 80 percent of church participants over the 1860-2000 period. Among these denominations, the Lutherans grow rapidly in popularity over the 1860-1890 period and the 1890-1952 period, remaining stable thereafter. In contrast, the Methodists and the Presbyterians decline steadily over time. There is no clear trend among the Baptists and the Catholics.

The inability of the Baptist church to increase its share of church participants contrasts with the surge in popularity of this denomination elsewhere in the United States, as documented by Finke and Stark (1992). The Midwest stands apart from the rest of the country in that the “traditional” denominations, particularly the Catholics and the Lutherans, continue to dominate, accounting for over half of all church participants by 2000. Even without the Baptist surge, religious participation increased steadily over time in the Midwest, rising over the 1860-1890 and 1890-1952 periods. Based on the statistics in the most recent 1972-2000 period, 55-60 percent of the population in our Midwestern counties are church adherents.\textsuperscript{15}

\textsuperscript{14}Although the number of members was also collected in the 1972-2000 census rounds, this statistic is not available for Catholics, a major denomination in our Midwestern counties, in these rounds.

\textsuperscript{15}Drawing on a number of different sources, Iannaccone (1998) reports church participation rates of 70 percent or even higher in the United States. Our statistic may be lower because it is based on a census of churches rather than the population, or because we divide by the entire population in the county when computing participation rates.
We next proceed to estimate the relationship between ethnic fractionalization in 1860 and religious participation in the county in each round of the CRB. The religious participation regression includes the same set of county-level controls as the regressions in Table 4, Columns 7-12 and Table 5. Because the regression is estimated over many census years, we simply report the 1860 fractionalization coefficient, together with the 95 percent confidence band, in each census year in Figure 3. This coefficient is less precisely estimated in the early census years, but grows steadily larger, while remaining statistically significant, all the way through to 2000.\footnote{The 1860 fractionalization coefficient with standard error in parentheses is $-0.66(0.39)$. This outlying coefficient is omitted from Figure 3 and Figure 4 that follows to clarify changes in the fractionalization coefficient over time. As noted, church seats and the number of members are both available in the 1890 CRB. We use the first statistic to measure church participation in Figure 3 and Figure 4 because it is more in line with trends in the fractionalization coefficient over time. Although not reported, the coefficient on 1860 agriculture share is also positive and significant in the religious participation regressions and grows larger over time. Unlike ethnic fractionalization, which soon ceased to be directly relevant, recall from Table 4 that agricultural counties in 1860 remained disproportionately agricultural in 1990. It is well known that farming communities tend to be more religious and community-oriented and so the persistent effect of the 1860 agriculture share may simply reflect the persistence of agricultural activity in particular areas over time.}

A stronger test of our framework is that its predictions should only apply to participation in migrant denominations. We consequently proceed to estimate two separate regressions in each census year; the first regression has the share of Lutherans and Catholics in the population as the dependent variable and the second regression has the share of all other denominations as the dependent variable. The 1860 fractionalization coefficient, with the corresponding 95 percent confidence band, is reported for each regression in each census year in Figure 4. We now see that the share of Lutherans and Catholics in the population is significantly greater in high fractionalization counties by 1870 and that the fractionalization effect gets steadily larger over time. Although we do not report results separately by denomination, this pattern is obtained for both the Catholics and the Lutherans. A one standard deviation decline in 1860 fractionalization would increase the population share of Lutherans and Catholics in the county by four percentage points (22 percent) in 2000. In contrast, the fractionalization coefficient is much smaller and negative, but remains significant and stable over time in the companion regression. These results, taken together, provide a simple explanation for the negative correlation between ethnic fractionalization in 1860 and religious fractionalization in 1990 that we reported in Table 4.\footnote{The pattern of coefficients reported in Figure 4 would also be obtained if the county controls were omitted from the participation regression, although the point estimates would be somewhat smaller. We are using three different measures of church participation over the 1860 period in Figure 4. One concern would be that the change in participation over time is mechanically driven by change in these measures. Notice, however, that participation increases steadily over time and not in three distinct jumps.}

Our explanation for the pattern in Figure 4 is that historical economic conditions gave rise to particularly well-functioning Lutheran and Catholic churches in the high fractionalization counties. An al-
ternative explanation for this pattern is that there are increasing returns to scale in church performance; Lutheran and Catholic churches were large to begin with in the high fractionalization counties, simply because there were more migrants from those denominations in the area, and subsequently grew larger over time. To rule out this explanation we experimented with augmented specifications that included (i) the share of Lutherans and Catholics, and (ii) a full set of 32 ethnic shares (which sum up to the share of migrants in the population), in 1860 by county, as regressors. The initial share of Lutherans and Catholics, as well as some of the ethnic shares do have persistent effects. However, the fractionalization coefficient remains stable over the course of the twentieth century with both the augmented specifications.\textsuperscript{18}

Initial conditions in 1860 would have determined subsequent in-migration by diverse ethnic groups and the formation of new Catholic and Lutheran churches in the decades that followed. The analysis in this paper is restricted to estimating the (overall) effect of initial conditions in 1860 on later outcomes and Figure 4 thus incorporates additions to the stock of churches and to the migrant population over time.\textsuperscript{19} The increase in the share of participating Lutherans and Catholics that we observe could in that case simply reflect growth at this extensive margin rather than a widening of the gap in church attendance (the intensive margin) between low and high fractionalization counties. The mechanism that we have proposed to explain the persistence of local identity requires that differences in church participation at the \textit{intensive} margin be maintained across counties. The CRB data do not allow us to separate church participation along the intensive and the extensive margin. However, the NLSY collects information on both religious affiliation (inherited at birth) as well as church attendance, which can be compared to shed light on these different marginal effects.

The NLSY consists of a nationally representative sample of American high school seniors in 1979 who were subsequently interviewed annually from 1979 to 1994 and biennially thereafter. The NLSY collects information on the respondents’ county of birth, the religious denomination that they were raised in, and church attendance in the 1979 and 2000 rounds. To be consistent with the results using the CRB, we aggregate the individual data to the county level. Table 7, Columns 1-2 regress religious affiliation, separately for the migrant and non-migrant denominations, on 1860 fractionalization and the county-controls.\textsuperscript{18}

\begin{footnotesize}
\begin{itemize}
\item In a related test, we also included religious fractionalization in 1860 as a regressor to allow for the possibility that competition between churches could have affected participation rates (Finke and Stark 1992, Gruber 2005). We find that religious fractionalization in 1860 has no effect on future church participation, leaving the estimated coefficients in Figure 4 unchanged.
\item The advantage of focussing on the initial conditions is that all networks had the same vintage at that point in time and so ethnic rivalry can be measured relatively easily. To estimate the effect of social heterogeneity in later decades we would need to consider the entire history of in-migration and account for differences in vintage and, hence, market power across ethnic networks.
\end{itemize}
\end{footnotesize}
The dependent variable in these regressions is measured as the share of respondents born in each county who were raised in the migrant denominations and the non-migrant denominations, respectively. Table 7, Columns 3-4 regress church participation, separately for the migrant and non-migrant denominations in 1979 and 2000, on 1860 fractionalization and the county-controls. The dependent variable is now measured as the share of the respondents born in each county who were raised in the relevant denominations and report attending church.

Individuals born in high fractionalization counties are more likely to be raised in migrant denominations and less likely to be raised in non-migrant denominations in Columns 1-2, although the fractionalization coefficient is not significant at conventional levels. This result indicates that some of the variation in participation with fractionalization in Figure 4 can be explained by growth in the migrant denominations at the extensive margin. Restricting attention to individuals who actually attend church, we see in Columns 3-6 that the fractionalization coefficient retains the same sign, but is now very precisely estimated for the migrant denominations. Notice that the fractionalization coefficient in Column 5 (the 2000 round) is very similar to the corresponding coefficient in Figure 4.

Church attendance and religious affiliation are jointly determined and so we cannot estimate the relationship between attendance (the intensity of participation) and fractionalization separately for individuals raised in the migrant denominations. However, the results in Table 7 can be used to test (and reject) the weaker hypothesis that attendance is uncorrelated with fractionalization in the migrant denominations. Suppose that a fraction $\theta_i$ of individuals raised in those denominations in county $i$ attend church. The value of the dependent variable in the participation regression, Column 3 and Column 5, will then be $\theta_i$ multiplied by the dependent variable in the religious affiliation regression in Column 1. It follows that the fractionalization coefficient in the participation regression will be simply $E(\theta_i) \hat{\beta}$ multiplied by the corresponding coefficient in the religious affiliation regression if $\theta_i$ is uncorrelated with fractionalization.\(^{20}\) What we see instead is that the coefficient in Column 3 (the 1979 round) is 50 percent larger than the corresponding coefficient in Column 1, while the coefficient in Column 5 (the 2000 round) is roughly the same size. In contrast, the fractionalization coefficient for the non-migrant denominations

\(^{20}\)Let the share of the population affiliated with the Lutheran and Catholic church in county $i$ be $a_i$. Let $X_i$ denote the level of 1860 fractionalization in that county. Ignoring the additional controls and the constant term, we are effectively estimating the following regressions:

\[ a_i = \beta X_i + \epsilon_i \]

\[ \theta_i a_i = \gamma X_i + u_i, \]

where $\epsilon_i$, $u_i$ are mean-zero disturbance terms. It follow that $\hat{\gamma} = E(\theta_i)\hat{\beta}$ if $cov(\theta_i, X_i) = 0$. 

22
Although not precisely estimated, declines substantially from Column 2 to Columns 4 and 6. As a check on the consistency of the results, notice that the fractionalization coefficient in 2000 for the migrant and non-migrant denominations in Columns 5-6 matches closely with the corresponding coefficients in Figure 4.

4 Local Identity and Career Decisions

Having described a mechanism through which local identity could have persisted over many generations, we now proceed to study its economic consequences. We hypothesize that individuals belonging to migrant denominations and born in high fractionalization counties should be endowed with a stronger sense of local identity and will consequently shade their career choices away from more mobile professional occupations. If the demand for professional occupations does not vary with fractionalization, as suggested by the results in Table 4 with the 1860 county-controls, then labor supply must respond to clear the market.

One supply-response mechanism would be for individuals belonging to the non-migrant denominations in high fractionalization counties to select disproportionately into the professional occupations. A second mechanism would be for individuals from the migrant denominations to continue to select into the professional occupations but to forego the relatively large returns to moving that are associated with those occupations. Finally, a third mechanism would be for individuals born in other counties and trained as professionals to move (at a cost) into the high fractionalization counties. Once we introduce individual heterogeneity in the population and assume that the cost of becoming a professional is decreasing in ability, it follows under reasonable conditions that all three mechanisms will be active in equilibrium. This implies that individuals born in high fractionalization counties will be less likely to become professionals on average. Professionals will move into those counties and non-professionals will move out to clear the market.

If the objective is to avoid moving from the county of birth, why are non-professionals systematically over-supplied in the high fractionalization counties? The model developed in this section and described

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21 The dependent variable in Columns 3-6 includes all individuals who attend church at least several times in the year, roughly matching the definition of adherents in the CRB. We experimented with a more stringent measure of participation – at least several times per month – without qualitatively changing the results. The fractionalization coefficient with the non-migrant denominations remains negative and insignificant, and is even smaller in absolute magnitude. The corresponding coefficient for the migrant denominations in 1979 declines to 0.23 and is no longer significant at conventional levels, while the coefficient in 2000 remains significant and is just slightly smaller (0.18) than the point estimate in Column 5. We continue to reject the hypothesis that the fractionalization coefficient is smaller with participation rather than religious affiliation as the dependent variable, despite the fact that participation rates with the more stringent measure fall by over 15 percentage points and are now below 0.7.
in greater detail in the Appendix shows that this result will be obtained in competitive equilibrium as long as the third mechanism is active and there is *ex ante* uncertainty in the demand for different types of jobs across counties.

To focus on the third supply-response mechanism, we now ignore heterogeneity in ability and variation in local identity within counties. There are two counties in this economy with $N$ individuals born in each county in each period. Two types of jobs are available: professional and non-professional. Individuals who are *ex ante* identical live for two periods, working in the second period of their lives. Those individuals who choose to occupy more productive professional jobs must invest in training in the first period of their lives. Individuals who expect to end up in non-professional jobs incur no such cost. On average, $sN$ professional jobs and $(1 - s)N$ non-professional jobs are demanded in each county in each period. However, these counties also face positive and negative demand shocks with equal probability, which separately shift the demand for professional and non-professional labor by $\epsilon sN$ and $\epsilon (1 - s)N$ respectively, but leave the total number of professional jobs $2sN$ and non-professional jobs $2(1 - s)N$ constant across the two counties in all periods.\[22\]

Once demand shocks are introduced, labor must flow across counties at the beginning of each period to clear the market. In addition, we assume that professional jobs are also associated with mid-career moves. This additional dimension of mobility in professional occupations is based on the idea that the labor market for a school teacher or a secretary tends to be local. In contrast, professionals such as university professors or management consultants are continually re-sorting across local and regional labor markets as new opportunities arise and fresh cohorts of workers enter. A professional can advance her career considerably with such a move if it becomes available and we will later see that professionals are indeed much more likely to migrate from their county of birth. We model this characteristic of professional occupations by assuming that the opportunity to enhance overall productivity by switching a professional working in a particular county with a professional working in the other county arrives with probability $P$ in each period.

Individuals dislike moving, particularly those with a strong local identity. Let the cost of moving be $C_1$ for individuals born in county 1 and $C_2 < C_1$ for individuals born in county 2 with weaker local identity. This is the only difference between workers in the two counties. We assume that all workers are employed and that professional workers always take advantage of the productivity enhancing career opportunities

\[22\] Within a county, demand shocks for professionals and non-professionals could be positively or negatively correlated. We could also allow the size of the shocks to vary, $\tau$ for the professionals and $\xi$ for the non-professionals, without changing the results reported below.
when they arise, in which case total output in this economy remains constant across all states of the world. Notice that this assumption effectively rules out the second labor-response mechanism described above. Although wages for professionals and non-professionals will adjust across the two locations to clear the labor market in practice, the competitive labor allocation can be conveniently derived as the solution to the Central Planner’s problem of minimizing expected training and moving costs across both locations.

Let the supply of professional labor in county 1 be \( x_1 \). We show in the Appendix that expected cost is a piece-wise linear function of \( x_1 \), as described in Figure 5, which is minimized at \( x_1^* = sN - \epsilon sN \) for \( P < 1/2(C_1 + C_2)/(C_1 - C_2) \) and at \( x_1^{**} = sN - \epsilon sN - \epsilon N(1 - 2s) \) for \( P > 1/2(C_1 + C_2)/(C_1 - C_2) \). The equilibrium supply of professional labor in county 1, with stronger local identity, falls short of the expected demand \( sN \) for all values of \( P \). Moreover, the share of professionals supplied by county 1 is strictly less than the corresponding share in county 2.

The intuition for this result is that as long as there is \textit{ex ante} uncertainty in the type of jobs demanded, some individuals will have to move in both counties with positive probability to clear the market. By allocating a surplus of non-professionals to county 1, the Central Planner increases the probability of such moves, but trades this off against the lower probability of having individuals born in county 1 move \textit{ex post} on the job. We show in the Appendix that the supply of professionals in county 1 could also fall short of the expected demand without uncertainty, but only if \( P > (C_1 + C_2)/(C_1 - C_2) \).

In our set up, individuals \textit{born} in county 1 are less likely to be professionals because they incur a greater cost when they move (\( C_1 > C_2 \)). However, this result could also be obtained if \( C_1 = C_2 \) and the demand for professional labor is lower in county 1, \( s_1N < s_2N \). The second prediction of the model, which allows us to rule out this alternative demand-side explanation, is that once the labor market has cleared, the share of professionals \textit{residing} in the two counties should on average be the same (\( sN \)). In contrast, if the demand for professional labor is lower in county 1, then individuals born and subsequently residing in that county should be less likely to be professionals.

5 Empirical Analysis

5.1 Individual Data

To test the predictions from the previous section we need information on the individual’s career choice, county of birth, and county of residence (post-employment). The NLSY is the only large-scale data set

\footnote{For \( P < 1/2(C_1 + C_2)/(C_1 - C_2) \), the share of professionals is \( s - \epsilon s \) in county 1 and \( s + \epsilon s \) in county 2. For \( P > 1/2(C_1 + C_2)/(C_1 - C_2) \), the corresponding shares are \( s - \epsilon(1 - s) \) and \( s + \epsilon(1 - s) \).}
that we are aware of that includes this information. The data set includes basic information on the respondent’s age, gender, race and, most importantly, county of birth. The Armed Forces Qualification Test (AFQT), which is designed to provide an unbiased measure of the individual’s intelligence, was administered to all respondents in 1979. Subsequent survey rounds collected contemporaneous information on educational attainment, employment, occupation, income, and county of residence. We will study occupational choice and other outcomes related to that economic decision at two points in time – 1994 and 2000 – when the respondents were old enough to be settled in their careers and to have made some job-related moves. Occupational choices from the NLSY in these years will be matched to census data on historical fractionalization, both in the individual’s county of birth and the contemporaneous county of residence, to test the predictions of the model.

Table 8 reports descriptive statistics for the individuals in our sample, who were on average 18 years old in 1979 and so around 33 years old in 1994 and 39 years old in 2000. Occupational categories in the NLSY (up to the 2000 round) are based on the 1970 codes from the census. Professional occupations are defined to include relevant codes listed under the Professional, Technical, and Kindred Workers category [1-196]. Job-related geographical mobility is the chief property that distinguishes professional and non-professional occupations in our model. We consequently exclude technical occupations and other occupations where career moves are unlikely to be important from this category.24

Based on this occupational classification, 10 percent of the respondents hold professional jobs, with little change from 1994 to 2000. 56 percent of all respondents had migrated out of their birth-county by 1994, with an increase to 59 percent by 2000. Consistent with the assumption that professional occupations are associated with greater mobility, 75 percent of the professionals and 53 percent of the non-professionals had migrated out of their birth-county by 1994 (these differences are significant at the 5 percent level and similar in 1994 and 2000).

Individuals in the sample are on average 33 years old by 1994 and should be established in the labor market. Nevertheless, employment levels continue to increase over time, from 81 percent in 1994 to 92 percent in 2000. Conditional on being employed, annual income (in 2000 dollars) also increases from 28,000 in 1994 to 33,000 in 2000. These changes in employment and income are presumably life-cycle effects, but they could, in principle, be due to selective attrition since this is a longitudinal survey. Notice, however, that racial composition and the proportion of women in the sample are very stable over the 1994-

24 These occupations include Librarians [32], Nurses, dieticians, and therapists [74-76], Religious workers [86,90], Social and recreation workers [100,101], Teachers, except college and university [141-145], and Technicians [150-174].
2000 period. Thus, we do not observe selective attrition from the sample, at least with respect to two important demographic characteristics that are associated with income and employment.

5.2 Fractionalization in the County of Birth and Occupational Choice

The first prediction from the model of occupational choice incorporating local identity is that individuals born in counties with greater ethnic fractionalization in 1860 should be less likely to hold professional jobs. Including race, gender, and age as regressors (although their omission would not affect the results) we see in Table 9, Columns 1-2 that individuals born in high fractionalization counties are indeed less likely to hold professional jobs in the 1994 and 2000 rounds of the NLSY. The individuals in our sample are drawn from 150 of the approximately 400 Midwestern counties that were incorporated and had attracted foreign migrants by 1860. While it thus seems unlikely that a few outlying counties are driving the results, we nevertheless report nonparametric estimates of the relationship between occupational choice and historical fractionalization in Figure 6. We see that the probability that the individual is a professional declines steadily with fractionalization, both in 1994 and in 2000, verifying the robustness of our results.\footnote{Our test of the hypothesis that identity shapes occupational choice relies on the assumption that fractionalization is uncorrelated with the demand for professional workers in the county. Recall from Table 4, however, that historical fractionalization had a positive and significant effect on current economic characteristics, measured by population in the county as well as racial fractionalization, but that this effect disappeared once important characteristics of the 1860 economy were included as regressors. More urban counties will have a greater demand for professional workers, shifting up the coefficient on the fractionalization variable in Table 9, Columns 1-2. The regressions that follow will thus include the same 1860 characteristics as in Tables 4 and 5 – population, manufacturing share and agriculture share – to control for variation in the demand for professional workers across counties.}

The prediction that high fractionalization counties should supply fewer professional workers is derived conditional on the total surplus that was historically available to migrants in the labor market $R$ and the total number of migrant workers $N$. Everything else equal, an increase in $R$ would increase the cost of exit at the margin, encouraging efforts to instill local identity historically and lowering the propensity to enter professional occupations today. Superior transportation infrastructure in 1860 was associated with

\footnote{The nonparametric regressions are estimated using the Epanechnikov kernel smoothing function. Less than 5 percent of the observations in Table 9, Columns 1-2 are drawn from counties with fractionalization below 0.45 and so too much weight should not be placed on the extremely steep initial decline in Figure 6. Although all the parametric regressions that follow will use the full set of counties, we verified that the fractionalization coefficient is unchanged when the sample is restricted to individuals drawn from counties in the 0.45-0.8 range.}
high fractionalization and a larger county population in Table 3 and so we expect fractionalization to be positively correlated with $R$. It follows that exclusion of $R$ from the occupation choice regression in Table 9, Columns 1-2 would have shifted the coefficient on fractionalization down. The same 1860 characteristics that we described above could be used to control for $R$, but since the professional demand effect and the surplus effect work in opposite directions, the effect of their inclusion on the fractionalization coefficient would now be ambiguous. By the same argument, we can no longer predict the sign of the coefficients on the 1860 characteristics when they are included in the occupation choice regression. For example, larger 1860 population is associated with urbanization today and, hence, an increased demand for professional jobs. At the same time, a larger 1860 population is associated with a larger $R$, stronger identity and, hence, a reduced supply of professional workers. Finally, we would want to account for the number of migrants $N$ when estimating the effect of fractionalization on occupational choice. This variable is highly correlated with county population (the correlation is 0.9) and so will be omitted from the regressions that follow. 1860 population captures the professional demand effect, the surplus effect, and the effect of $N$ on occupational choice.

We see in Table 9, Columns 3-4 that the coefficient on 1860 fractionalization becomes more negative and is more precisely estimated once the additional county-level controls are included in the occupational choice regressions. Based on the estimates in Column 4, a one standard deviation decline in ethnic fractionalization would increase the probability of holding a professional job from 10 percent to as much as 16 percent. Individuals born in counties with a greater share of manufacturing and agricultural jobs in 1860 are also less likely to hold professional jobs. Population in 1860, in contrast, has no effect on occupational choice in both the 1994 and the 2000 rounds. Finally, women and Non-Whites are significantly less likely to hold professional jobs in Columns 1-4.

Figure 4 traces a continuous link between initial conditions in 1860 and participation in select religious denominations historically dominated by the migrants over the subsequent 140 years using the CRB. Table 7 verifies that a consistent relationship between 1860 fractionalization and 2000 church participation is obtained with CRB and NLSY data. Table 9 completes the analysis by documenting the negative relationship between fractionalization and occupational choice in 2000 based on the NLSY sample. We close this section by discussing a number of tests that we conducted to verify the robustness of the key occupational choice result.

1. **Alternative construction of the fractionalization variable**: First, we computed ethnic
fractionalization in 1860 with men only. Both men and women participated in the workforce in the nineteenth and early twentieth centuries, with ethnic networks channeling women into jobs as well. Bodnar (1980), for example, cites a 1930 study of two thousand foreign-born women, most of whom reported that they had secured their first job through social connections. Nevertheless, we might expect labor networks to have been organized along gender lines within ethnic groups, with male networks occupying a dominant position in the labor market and in the communities they were drawn from. The coefficient on the alternative fractionalization measure (computed using men alone) continues to be negative and significant, although it is smaller in size.

Inspection of the occupation categories in Table 2 indicates that farmers made up 50 percent of the workforce in 1860. Ethnic competition may have been less relevant in this category and so we recomputed the county-level fractionalization statistic placing zero weight on fractionalization among the farmers as a second robustness test.26 The fractionalization coefficient becomes slightly larger in absolute magnitude and is more precisely estimated.

As a third test, we constructed the fractionalization variable using alternative occupational classifications. The county-level statistic that we use in all the regressions reported in the paper is computed as the weighted average of ethnic fractionalization within each of the 11 occupational categories listed in Table 2. We measured labor market rivalry within a coarser set of four occupational categories as well as within a finer set of 139 occupations, without changing any of the results.27

2. Alternative construction of the occupation variable: First, we expanded the set of professional occupations by including individuals assigned to the “managers and administrators” code [245] within the broader Managers and Administrators, except Farm category [201-245]. Most of the specific occupations listed in this broad category do not conform to our definition of a professional occupation and the “managers and administrators” classification does not provide much information on the actual

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26 We include all individuals who report being employed, regardless of their age, when computing the fractionalization statistic since there were no age restrictions on employment at that time. Apart from the 11 broad occupational categories in Table 2, some individuals in the census were also assigned to an undefined occupational category. Women were disproportionately represented in this category, which presumably covers home production and other informal activities. As with the farmers, we assume that networks were less relevant in this category and assign it zero weight when computing ethnic fractionalization in all the regressions that we report. Nevertheless, we verified that assigning a weight to this category based on its share of the migrant workforce in the county had no effect on the estimated fractionalization coefficient in the occupational choice regression.

27 The four aggregate categories are white collar, agriculture, manufacturing, and service and laborers. These categories correspond to the broad headings in Table 2 except that Blue collar, nonfarm is divided into manufacturing (craftsman, operative) and service and laborers (household service, service, laborer non-farm). The 139 disaggregate occupations are defined at the three-digit census code level. 84 percent of the listed occupations in the 1860 data are drawn from just 11 of these occupations.
nature of jobs that it covers. However, 74.7 percent of the individuals assigned to that category migrated out of the county of their birth, which is close to the level of migration for the other occupations that we include in the professional category. Inclusion of the managers and administrators in the professional classification increased the share of professionals in the sample to 18 percent. Although these results need to be interpreted with caution since the additional professional occupations are selected on the basis of an outcome (migration) rather than their fundamental characteristics, we nevertheless verified that the fractionalization coefficient in the occupational choice regression with this expanded definition of professional activity remained significant, with a point estimate of -0.35. With this measure of the occupation variable, a one standard deviation decline in fractionalization would increase the probability of holding a professional job from 18 percent to 25 percent.

As a second test we ran the occupational choice regression in other years – 1993, 1996, 1998 – generating a pattern of fractionalization coefficients very similar to the point estimates obtained in 1994 and 2000.

3. Alternative specification of the occupation regression: First, we replaced total population with the migrant population and, separately, with the workforce, in the occupational choice regression. These variables are all highly correlated, and not surprisingly the results were unchanged.

Second, we included the share of migrants in the workforce, and the interaction of this variable with ethnic fractionalization, as additional regressors. This specification allows for the possibility that ethnic fractionalization had a larger effect in counties where migrants made up a larger share of the total population. However, both these variables had an insignificant effect on occupational choice, leaving the (uninteracted) fractionalization coefficient unchanged.

Third, we included the population share of each ethnicity in the 1860 census, computed at the level of the county, as additional regressors to allow for the possibility that individuals with particular ethnic ancestry continue to be concentrated in specific occupations today. Given the high rate of inter-county migration, we do not expect the ethnic shares in 1860 to be relevant today and not surprisingly the fractionalization coefficient was hardly affected by the inclusion of these additional regressors.

5.3 Fractionalization and Outcomes Related to Occupational Choice

An individual born in a county with higher ethnic fractionalization in 1860 is less likely to select into a professional occupation in 1994 and 2000. Our interpretation of this result is that individuals born in high fractionalization counties identify strongly with their local communities and so wish to avoid the spatial mobility that comes with professional occupations. The regression results reported in Table 10,
Columns 1-2 indicate that individuals from high fractionalization counties are indeed significantly less likely to migrate from the county of their birth. On average, around 58 percent of the individuals in the sample migrate from the county of birth. The point estimates indicate that a one standard deviation increase in fractionalization reduces migration by 8 percentage points (a 14 percent decline). Among the other regressors, none of the 1860 county-level controls significantly affect migration, but Whites are significantly more likely to move. Age is also (mechanically) positively associated with migration.

Does the effect of fractionalization on occupational choice and migration that we have just described have financial consequences? The results in Table 10, Columns 3-4 indicate that while individuals born in counties with a greater share of manufacturing and agriculture in 1860 are significantly more likely to hold a job by 2000, employment levels do not vary significantly with ethnic fractionalization in 1994 or 2000. Whites and males are, not surprisingly, significantly more likely to be employed, although the importance of these individual characteristics declines over time.

In contrast with the results for employment, the income regressions reported next in Table 10, Columns 5-6 indicate that high fractionalization is associated with significantly lower income (in 2000), conditional on being employed. Average annual income in 2000 was 33,000 dollars, and so our estimates indicate that a one standard deviation increase in fractionalization would have reduced income by 2,300 dollars (a 7 percent decrease). A greater share of manufacturing and agriculture in 1860 is associated with lower income in 2000, with Whites and males earning significantly more in 1994 and 2000.

5.4 Alternative Explanations

1. Fractionalization and the demand for professionals: The second prediction of the model is that historical fractionalization in the county of residence should have no effect on occupational choice. This implies that non-professional workers must flow out of the high fractionalization counties, while professional workers flow in to clear the labor market. This prediction rules out the possibility that differences in the demand for professional labor across counties are driving our results.

To test this prediction we regress occupation on fractionalization in the county of residence in Table 11. The fractionalization coefficient is small and insignificant in 1994 and 2000, with and without the county controls in Columns 1-4. It actually changes sign and is positive in three of the four specifications.

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28Recall that one supply-response mechanism was for individuals from migrant denominations to continue to select into the professional occupations but to forego the relatively large returns to moving that are associated with those occupations. Although it is tempting to estimate the relationship between migration and fractionalization separately for the professionals, note that occupational choice is jointly determined with migration in our framework. By the same argument, we cannot estimate the relationship between occupational choice and fractionalization separately by religious denomination.
Individuals working in high fractionalization counties are at least as likely to be professionals as individuals working in low fractionalization counties. It is only individuals born in those counties who are less likely to select into those occupations.  

2. Fractionalization and educational attainment: Could variation in individual ability or the quality of the school system have generated the observed variation in the supply of professionals across counties? High fractionalization counties had superior transportation infrastructure in 1860 and so were most likely growing relatively rapidly at that time. While it is possible that particular types of migrants were attracted to those counties, the high rates of inter-county migration in the Midwest make it unlikely that initial differences in ability across counties would have persisted over time. We also noted earlier that while 1860 fractionalization may have been positively correlated with relevant measures of social heterogeneity many decades later when the secondary school system was being established, fractionalization was also positively correlated with religious participation. The net effect of fractionalization on investments in education was thus seen to be ambiguous, and reassuringly, 1860 fractionalization was uncorrelated with education expenditures in 1990 in Table 5.

To provide direct support for the idea that individuals born in high fractionalization counties are no less capable and no less prepared to invest in the human capital that is necessary to secure professional jobs, we regress measures of educational attainment obtained from the NLSY on 1860 fractionalization in Table 12. We see in Table 12, Columns 1-3 that fractionalization, and all the 1860 county-controls for that matter, have no effect on AFQT scores, high school completion, and college completion. In contrast, individual characteristics have a strong effect on AFQT scores and college completion.

Why are individuals born in high fractionalization counties as likely to attend and complete college even though they expect to end up in non-professional occupations? To explore this result further, we construct a binary variable that indicates whether the college major would have channeled the individual into a less mobile occupation. Individuals born in high fractionalization counties and females are significantly

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29One remaining concern is that the mismatch between the supply and the demand for professional labor in the high fractionalization counties could have been driven by unexpected changes in the demand for professionals in those counties rather than a strong local identity. Suppose, for example, that the demand for professionals was systematically lower in high fractionalization counties historically and then increased in the 1980’s, with the restructuring of the U.S. economy, after our NLSY cohort had made their career choices. To rule out this possibility, we regressed manufacturing share, agriculture share, and county population in 1970, obtained from the 1972 County Data Book, on the same 1860 characteristics as in Table 4, Columns 7-9. 1860 fractionalization has no effect on economic conditions in 1970, just as we saw earlier with the same conditions in 1990.

30The fact that fractionalization is uncorrelated with education also rules out an alternative channel through which fractionalization could affect religious participation (see Sacerdote and Glaeser [2001] for an analysis of the complex relationship between education and religious participation).

31The non-professional (less mobile) majors include agriculture and natural resources, accounting, hotel and restaurant

32
more likely to choose such majors in Table 12, Column 4. On average, 39 percent of the individuals in the sample who complete college choose majors that are associated with lower mobility. The point estimates indicate that a one standard deviation increase in fractionalization would increase the likelihood of such a major being chosen by four percentage points (a 10 percent increase). Once again, we uncover evidence that suggests that individuals born in high fractionalization counties are making conscious choices that restrict their future mobility.

6 Conclusion

This paper draws a connection between ethnic labor networks in the American Midwest when it was first being settled, the local identity that emerged endogenously to support these networks and then persisted over many generations, and occupational choice today. Individuals born in counties with greater ethnic fractionalization in 1860, which we expect to be associated with stronger local identity and better functioning parochial institutions, are significantly less likely to select into professional occupations, which come with greater geographical mobility, in 2000.

The results in this paper are relevant to the ongoing debate on “economic institutions” (Acemoglu, Johnson and Robinson [2001, 2002]) versus “culture” (Barro and McCleary 2003, Tabellini 2005, Fernandez and Fogli 2007, Guiso, Sapienza, and Zingales 2008) as determinants of growth. We find that a local cultural trait generates significant variation in occupational choice within a relatively homogenous region – the American Midwest – and it is possible that cultural effects of this sort would be even larger across countries or regions with very different histories. At the same time, culture cannot be sustained without institutional support. Social institutions such as the church and the family help sustain cultural traits, which in turn keep these institutions alive. As long as these institutions continue to be useful, cultural traits can persist long after the economic circumstances that gave rise to them have ceased to be relevant. While the economics literature has focussed much of its attention on economic and political institutions, social institutions, with their complementary cultural traits, might have important effects on growth as well.
7 Appendix: Labor Market Equilibrium

7.1 Population and Production Technology

Two types of jobs are available in this economy: professional and non-professional. Individuals who are \textit{ex ante} identical live for two periods, working in the second period of their lives. Those individuals who choose to occupy professional jobs incur a training cost $C_e$ in the first period of their lives. Individuals who expect to end up in non-professional jobs incur no such cost. The expected output obtained from a professional worker who takes advantage of career opportunities when they arise is $\bar{\theta}$ and the output obtained from an non-professional worker with certainty is $\theta < \bar{\theta}$.

There are two counties in this economy with $N$ individuals born in each county in each period. On average, $sN$ professional jobs and $(1 - s)N$ non-professional jobs are demanded in each county in each period. However, these counties also face demand shocks, with two states of the world occurring with equal probability:

**State 1:** $sN + \epsilon sN$ professional and $(1 - s)N + \epsilon (1 - s)N$ non-professional jobs in county 1.

$sN - \epsilon sN$ professional and $(1 - s)N - \epsilon (1 - s)N$ non-professional jobs in county 2.

**State 2:** $sN - \epsilon sN$ professional and $(1 - s)N - \epsilon (1 - s)N$ non-professional jobs in county 1.

$sN + \epsilon sN$ professional and $(1 - s)N + \epsilon (1 - s)N$ non-professional jobs in county 2.

Notice that these demand shocks are skill neutral, in the sense that the probability of receiving a shock is the same for professional and non-professional workers within each county. The shocks are also positively correlated for professional and non-professional workers within a county. We could relax each of these assumptions without changing any of the results that follow.\textsuperscript{32} In addition, the opportunity to enhance overall productivity by switching a professional working in a particular county with a professional working in the other county arrives with probability $P$ in each period.

Let the cost of moving be $C_1$ for individuals born in county 1 and $C_2 < C_1$ for individuals born in county 2 with weaker local identity. We assume that all workers are employed and that professional workers always take advantage of the productivity enhancing career opportunities when they arise, in which case total output in this economy remains constant across all states of the world: $2N \left[ s\bar{\theta} + (1 - s)\theta \right]$. The competitive labor market equilibrium can be obtained in that case as the solution to the Central Planner’s problem of minimizing training and moving costs across both locations.

\textsuperscript{32}Specifically, we allowed shocks to be perfectly negatively correlated for professional and non-professional workers within each county. We also allowed the size of the shocks to vary; $\epsilon$ for professionals and $\bar{\epsilon}$ for non-professionals.
7.2 The Central Planner’s Problem

Let the supply of professional labor in county 1 be $x_1$. From the structure of the demand shocks it
then follows that the supply of professional labor in county 2 will be $2sN - x_1$ and that the supply of
non-professional labor in county 1 will be $N - x_1$. We derive $x_1$ as the solution to the Central Planner’s
cost minimization problem. Expected cost turns out to be a piece-wise linear function of $x_1$ and so it will
be convenient to solve what is essentially a linear programming problem in three regimes:

**Regime 1:** $x_1 \in [sN - \epsilon sN, sN + \epsilon sN]$

The supply of professional labor in each county is sufficient to satisfy the minimum demand in that
county but does not exceed the maximum demand.

The labor flow in each state of the world can then be derived as:

**Flow in state 1:** $sN + \epsilon sN - x_1$ professional labor from county 2 to county 1.

$(1 - s)N + \epsilon(1 - s)N - (N - x_1)$ non-professional labor from county 2 to county 1.

**Flow in state 2:** $x_1 - [sN - \epsilon sN]$ professional labor from county 1 to county 2.

$(N - x_1) - [(1 - s)N - \epsilon(1 - s)N]$ non-professional labor from county 1 to county 2.

The Central Planner chooses $x_1$ to minimize expected cost

$$E(C) = 2sNC_\epsilon + \frac{1}{2} \epsilon N (C_1 + C_2) + P_{x_1}C_1 + P(2sN - x_1)C_2,$$  \hspace{1em} (1)

where the second term on the right hand side is the cost associated with movement at the start of the
period and the last two terms reflect movement of professional labor during the period. Because $C_1 > C_2$
it is easy to verify that $E(C)$ is increasing linearly in $x_1$ and will be minimized at $x_1^* = sN - \epsilon sN$. Labor
flows with $x_1 = x_1^*$ are then obtained as:

**Flow in state 1 ($x_1 = x_1^*$):** $2\epsilon sN$ professional labor from county 2 to county 1.

$\epsilon N(1 - 2s)$ non-professional labor from county 2 to county 1.\(^{33}\)

**Flow in state 2 ($x_1 = x_1^*$):** No flow of professional labor.

$\epsilon N$ non-professional labor from county 1 to county 2.

**Regime 2:** $x_1 \in [sN - \epsilon sN - \epsilon N(1 - 2s), sN - \epsilon sN]$

\(^{33}\)To generate a positive labor flow we require $s \leq 1/2$. This is a reasonable assumption since just a small fraction of
jobs (9 percent in our data) are professional. For the case with asymmetric shocks, $\tau$ for the professionals and $\xi$ for the
non-professionals, the corresponding condition is $s \leq 1/(1 + \tau/\xi)$.
We now reduce the supply of non-professional labor in county 2, but at most to the point where no non-professional labor flows to county 1 in state 1. In our set up, any reduction in non-professional labor supply in county 2 must lead to a reduction in professional labor in county 1 by the same amount. It then follows that the supply of professional labor in county 1 will no longer be sufficient to meet even the minimum demand in that county, while the supply of professional labor in county 2 will exceed the maximum demand in that county. Labor flows at the beginning of the period will necessarily increase, with an accompanying increase in moving costs, but we will see that this may be outweighed by the reduced cost of recounty for professional workers from county 1.

The labor flow in each state is derived as:

**Flow in state 1:** \( sN + \epsilon sN - x_1 \) professional labor from county 2 to county 1.

\( (1 - s)N + \epsilon(1 - s)N - (N - x_1) \) non-professional labor from county 2 to county 1.

**Flow in state 2:** \( sN - \epsilon sN - x_1 \) professional labor from county 2 to county 1.

\( (N - x_1) - [(1 - s)N - \epsilon(1 - s)N] \) non-professional labor from county 1 to county 2.

The expected cost can then be expressed as:

\[
E(C) = 2sNC_e + \frac{1}{2} [\epsilon N + sN(1 - \epsilon) - x_1] (C_1 + C_2) + P x_1 C_1 + P(2sN - x_1) C_2. \tag{2}
\]

Collecting terms, \( E(C) \) is declining linearly in \( x_1 \) and continues to be minimized at \( x_1^* = sN - \epsilon sN \) if \( P < 1/2(C_1 + C_2)/(C_1 - C_2) \). However, the local minimum is obtained at \( x_1^{**} = sN - \epsilon sN - \epsilon N(1 - 2s) \), if the sign of the inequality is reversed. This will be the case if \( P \) and \( C_1 - C_2 \) are sufficiently large. Substituting \( x_1^{**} \) in equation (2) above, it is easy to verify that the term in square brackets is greater than \( \epsilon N \), the term corresponding to it in equation (1), which implies that moving costs at the beginning of the period increase when going from \( x_1^* \) to \( x_1^{**} \). However, moving costs during the period decrease with the reduction in \( x_1 \), and this effect dominates under the conditions on \( P \) and \( C_1 - C_2 \) derived above. Labor flows with \( x_1 = x_1^{**} \) are obtained as:

**Flow in state 1** \( (x_1 = x_1^{**}) \): \( \epsilon N \) professional labor from county 2 to county 1.

No flow of non-professional labor.

**Flow in state 2** \( (x_1 = x_1^{**}) \): \( \epsilon N(1 - 2s) \) professional labor from county 2 to county 1.

\( 2\epsilon N(1 - s) \) non-professional labor from county 1 to county 2.

**Regime 3:** \( x_1 \in [0, sN - \epsilon sN - \epsilon N(1 - 2s)] \)
We now reduce the supply of professional labor in county 1, with an accompanying increase in non-professional labor, even further so that professional labor flows from county 2 to county 1 and non-professional labor flows in the opposite direction in both states of the world.

Labor flows are now derived as:

**Flow in state 1**: $sN + \epsilon sN - x_1$ professional labor from county 2 to county 1.

$(N - x_1) - [(1 - s)N + \epsilon(1 - s)N]$ non-professional labor from county 1 to county 2.

**Flow in state 2**: $sN - \epsilon sN - x_1$ professional labor from county 2 to county 1.

$(N - x_1) - [(1 - s)N - \epsilon(1 - s)N]$ non-professional labor from county 1 to county 2.

The corresponding expected cost expression is obtained as:

$$E(C) = 2sNC_e + \frac{1}{2} [2(sN - x_1)] (C_1 + C_2) + Px_1C_1 + P(2sN - x_1)C_2.$$  \((3)\)

It is straightforward to verify that $E(C)$ is unambiguously decreasing in $x_1$ and, hence, is minimized at $x_1^{**} = sN - \epsilon sN - \epsilon N(1 - 2s)$.

### 7.3 Equilibrium Labor Allocation

As described in Figure 5 and derived above, $E(C)$ is increasing in $x_1$ to the right of $sN - \epsilon sN$ and decreasing in $x_1$ to the left of $sN - \epsilon sN - \epsilon N(1 - 2s)$ for all values of $P$. For $x_1 \in [sN - \epsilon sN - \epsilon N(1 - 2s), sN - \epsilon sN]$, $E(C)$ is declining in $x_1$ for $P < 1/2(C_1 + C_2)/(C_1 - C_2)$, whereas $E(C)$ is increasing in $x_1$ when the sign of the inequality is reversed. The global minimum is consequently obtained at $x_1^* = sN - \epsilon sN$ for $P < 1/2(C_1 + C_2)/(C_1 - C_2)$ and at $x_1^{**} = sN - \epsilon sN - \epsilon N(1 - 2s)$ for $P > 1/2(C_1 + C_2)/(C_1 - C_2)$.

The supply of professional labor in county 1 falls short of the expected demand $sN$ for all values of $P$. Without uncertainty, the supply of professionals in county 1 could still fall short of the expected demand, but only if $P > (C_1 + C_2)/(C_1 - C_2).$\(^{34}\)

\(^{34}\)Without uncertainty in labor demand, $sN$ professional and $(1 - s)N$ non-professional jobs are available in each county in each period. Let $x_1 \in [0, sN]$ measure the supply of professional workers in county 1. It then follows that $sN - x_1$ professional workers would flow from county 2 to county 1 and $(N - x_1) - (1 - s)N$ non-professional workers would flow in the opposite direction at the beginning of each period. Using the same notation as above, the Central Planner chooses $x_1$ to minimize

$$E(C) = 2sNC_e + (sN - x_1)(C_1 + C_2) + Px_1C_1 + P(2sN - x_1)C_2.$$ 

It follows that $x_1 = sN$ if $P < (C_1 + C_2)/(C_1 - C_2)$. $x_1 = 0$ and professional labor is under-supplied in county 1 if the sign of the inequality is reversed.
References


Figure 1: Early Growth in the Midwest

- Incorporated counties
- Counties with railroads
Figure 2: Ethnic Fractionalization in 1860
Figure 3: Church Participation

1860 fractionalization coefficient in each census year (with 95% confidence band)
Figure 4: Church Participation by Denomination

1860 fractionalization coefficient in each census year (with 95% confidence band)
Figure 5: The Central Planner's Problem

The expected cost is given by:

\[ P > \frac{1}{2} \frac{(C_1+C_2)}{(C_1-C_2)} \]

\[ P < \frac{1}{2} \frac{(C_1+C_2)}{(C_1-C_2)} \]

where \( s_N \) is the share of professionals in county 1.

The graph shows the expected cost vs. the share of professionals in county 1.
Table 1: Ethnic Distribution, 1860-1900

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>1860</th>
<th>1880</th>
<th>1900</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scandinavia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Danish</td>
<td>0.01</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Finish</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Norwegian</td>
<td>0.03</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>Swedish</td>
<td>0.02</td>
<td>0.06</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>British Isles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>0.13</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>Irish</td>
<td>0.25</td>
<td>0.19</td>
<td>0.11</td>
</tr>
<tr>
<td>Scottish</td>
<td>0.03</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Welsh</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Western Europe</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belgian</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Dutch</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>French</td>
<td>0.03</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>German</td>
<td>0.32</td>
<td>0.37</td>
<td>0.41</td>
</tr>
<tr>
<td>Italian</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Swiss</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td><strong>Eastern Europe</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Czech</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Hungarian</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Polish</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>USSR</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>0.14</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: IPUMS 1:100 sample, including all foreign-born individuals.
Table 2: Occupational Distribution, 1860-1900

<table>
<thead>
<tr>
<th>Census year:</th>
<th>1860</th>
<th>1880</th>
<th>1900</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>White collar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>0.04</td>
<td>0.04</td>
<td>0.05</td>
</tr>
<tr>
<td>Manager</td>
<td>0.04</td>
<td>0.04</td>
<td>0.06</td>
</tr>
<tr>
<td>Clerical</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Sales</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Farm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer</td>
<td>0.50</td>
<td>0.41</td>
<td>0.31</td>
</tr>
<tr>
<td>Laborer, Farm</td>
<td>0.12</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>Blue collar, nonfarm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Craftsman</td>
<td>0.10</td>
<td>0.08</td>
<td>0.09</td>
</tr>
<tr>
<td>Operative</td>
<td>0.05</td>
<td>0.08</td>
<td>0.09</td>
</tr>
<tr>
<td>Household Service</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Service</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Laborer, Non-Farm</td>
<td>0.09</td>
<td>0.10</td>
<td>0.12</td>
</tr>
<tr>
<td>Total</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: IPUMS 1:100 sample, including all foreign-born individuals who report that they are employed and report an occupational category.
Table 3: Transportation Infrastructure and County Characteristics, 1860

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Ethnic fractionalization</th>
<th>Manufacturing share</th>
<th>Agriculture share</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Railroad through county, 1860</td>
<td>0.049</td>
<td>0.001</td>
<td>-0.013</td>
<td>0.102</td>
</tr>
<tr>
<td></td>
<td>(0.022)</td>
<td>(0.008)</td>
<td>(0.013)</td>
<td>(0.012)</td>
</tr>
<tr>
<td>Distance to canal, 1890</td>
<td>-0.668</td>
<td>0.169</td>
<td>-0.034</td>
<td>-0.469</td>
</tr>
<tr>
<td></td>
<td>(0.191)</td>
<td>(0.097)</td>
<td>(0.125)</td>
<td>(0.102)</td>
</tr>
<tr>
<td>Distance to Great Lakes harbor</td>
<td>-0.252</td>
<td>-0.066</td>
<td>0.100</td>
<td>-0.136</td>
</tr>
<tr>
<td></td>
<td>(0.073)</td>
<td>(0.029)</td>
<td>(0.048)</td>
<td>(0.056)</td>
</tr>
<tr>
<td>Observations</td>
<td>401</td>
<td>401</td>
<td>401</td>
<td>401</td>
</tr>
</tbody>
</table>

Note: Robust standard errors in parentheses.
Distance to canal and distance to Great Lakes harbor measured in thousands of kilometers.
Fractionalization is one minus the Herfindahl index of ethnic concentration, averaged across occupational categories.
Manufacturing share and agriculture share in 1860 computed using IPUMS.
Population divided by 100,000.
### Table 4: Fractionalization in 1860 and County Characteristics in 1990

<table>
<thead>
<tr>
<th>Year:</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable:</td>
<td>(1)</td>
</tr>
<tr>
<td>Fractionalization, 1860</td>
<td>-0.022</td>
</tr>
<tr>
<td>(Fractionalization, 1860)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>Manufacturing share, 1860</td>
<td>--</td>
</tr>
<tr>
<td>(Manufacturing share, 1860)</td>
<td>(0.038)</td>
</tr>
<tr>
<td>Agriculture share, 1860</td>
<td>--</td>
</tr>
<tr>
<td>(Agriculture share, 1860)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>Population, 1860</td>
<td>--</td>
</tr>
<tr>
<td>(Population, 1860)</td>
<td>(0.031)</td>
</tr>
<tr>
<td>Observations</td>
<td>437</td>
</tr>
</tbody>
</table>

Note: Robust standard errors in parentheses.
Fractionalization is one minus the Herfindahl index of ethnic concentration, averaged across occupational categories.
Manufacturing share in 1860 and agriculture share in 1860 are computed using IPUMS.
Population is divided by 100,000.
Manufacturing share in 1990 defined as share of civilian labor force employed in manufacturing.
Agriculture share in 1990 is computed using farm population and total population in county.
Ethnic fractionalization in 1990 is one minus the Herfindahl index of (white) ethnic concentration based on 16 ethnicities.
Racial fractionalization in 1990 is one minus the Herfindahl index of racial concentration based on 5 racial groups.
Religious fractionalization in 1990 is one minus the Herfindahl index of religious concentration based on 18 denominations.
### Table 5: Fractionalization in 1860 and Local Government Expenditure in 1990

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>1990</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total expenditure</td>
<td>education</td>
<td>health</td>
<td>police</td>
<td>roads</td>
<td>welfare</td>
</tr>
<tr>
<td></td>
<td>per capita</td>
<td>share</td>
<td>share</td>
<td>share</td>
<td>share</td>
<td>share</td>
</tr>
<tr>
<td>Fractionalization, 1860</td>
<td>0.143</td>
<td>-0.055</td>
<td>-0.011</td>
<td>0.014</td>
<td>0.019</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>(0.145)</td>
<td>(0.047)</td>
<td>(0.026)</td>
<td>(0.004)</td>
<td>(0.012)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>Manufacturing share, 1860</td>
<td>0.432</td>
<td>0.065</td>
<td>-0.019</td>
<td>0.004</td>
<td>-0.050</td>
<td>-0.024</td>
</tr>
<tr>
<td></td>
<td>(0.469)</td>
<td>(0.155)</td>
<td>(0.060)</td>
<td>(0.014)</td>
<td>(0.030)</td>
<td>(0.029)</td>
</tr>
<tr>
<td>Agriculture share, 1860</td>
<td>-0.042</td>
<td>0.020</td>
<td>0.047</td>
<td>-0.011</td>
<td>-0.001</td>
<td>-0.025</td>
</tr>
<tr>
<td></td>
<td>(0.410)</td>
<td>(0.106)</td>
<td>(0.048)</td>
<td>(0.009)</td>
<td>(0.026)</td>
<td>(0.031)</td>
</tr>
<tr>
<td>Population, 1860</td>
<td>0.168</td>
<td>-0.167</td>
<td>-0.005</td>
<td>0.026</td>
<td>-0.046</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.160)</td>
<td>(0.047)</td>
<td>(0.016)</td>
<td>(0.007)</td>
<td>(0.020)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>Observations</td>
<td>437</td>
<td>437</td>
<td>437</td>
<td>437</td>
<td>437</td>
<td>437</td>
</tr>
</tbody>
</table>

Note: Robust standard errors in parentheses.
Fractionalization is one minus the Herfindahl index of ethnic concentration, averaged across occupational categories.
Manufacturing share in 1860 and agriculture share in 1860 are computed using IPUMS.
Population is divided by 100,000.
Total expenditure per capita is measured in thousands of dollars (1990).
Shares in columns (2) through (6) are computed as fraction of total expenditure.
Table 6: Distribution of Denominations and Church Participation, 1860-2000

<table>
<thead>
<tr>
<th>Measure of church participation:</th>
<th>church seats</th>
<th>church members</th>
<th>church adherents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Census year:</td>
<td>1860 (1)</td>
<td>1890 (2)</td>
<td>1890 (3)</td>
</tr>
<tr>
<td>Baptist</td>
<td>0.14</td>
<td>0.11</td>
<td>0.08</td>
</tr>
<tr>
<td>Catholic</td>
<td>0.11</td>
<td>0.13</td>
<td>0.29</td>
</tr>
<tr>
<td>Lutheran</td>
<td>0.05</td>
<td>0.12</td>
<td>0.14</td>
</tr>
<tr>
<td>Methodist</td>
<td>0.38</td>
<td>0.27</td>
<td>0.21</td>
</tr>
<tr>
<td>Presbyterian</td>
<td>0.14</td>
<td>0.08</td>
<td>0.06</td>
</tr>
<tr>
<td>Other</td>
<td>0.18</td>
<td>0.28</td>
<td>0.22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.00</strong></td>
<td><strong>1.00</strong></td>
<td><strong>1.00</strong></td>
</tr>
<tr>
<td>Church participation</td>
<td>0.59</td>
<td>0.67</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Source: Census of Religious Bodies.

Church participation is computed as the number of church seats divided by the population 1860-1890, the number of church members divided by the population 1890-1952, and the number of church adherents divided by the population 1972-2000.
Table 7: Fractionalization in 1860 and Church Participation (NLSY)

<table>
<thead>
<tr>
<th>Year: Church denomination:</th>
<th>Dependent variable:</th>
<th>1860</th>
<th>1979</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fractionalization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.205 (0.160)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.235 (0.159)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.292 (0.155)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.124 (0.161)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.210 (0.112)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.116 (0.129)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacturing share</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.456 (0.359)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.373 (0.360)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.637 (0.348)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.537 (0.378)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.226 (0.302)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.138 (0.370)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agriculture share</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.292 (0.313)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.244 (0.304)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.195 (0.321)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.377 (0.291)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.153 (0.227)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.088 (0.247)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.276 (0.135)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.273 (0.126)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.314 (0.136)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.198 (0.134)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.090 (0.087)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.133 (0.089)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Observations</td>
<td>222</td>
<td>222</td>
<td>222</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses.
Fractionalization is one minus the Herfindahl index of ethnic concentration, averaged across occupational categories.
Manufacturing share in 1860 and agriculture share in 1860 are computed using IPUMS.
Population divided by 100,000.
Migrant denominations are Catholic and Lutheran.
Participation defined as attended church at least several times in the past year.
<table>
<thead>
<tr>
<th></th>
<th>1994</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Professional</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Migrated out of county of birth</td>
<td>0.56</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Employed</td>
<td>0.81</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Income</td>
<td>27.80</td>
<td>33.06</td>
</tr>
<tr>
<td></td>
<td>(0.51)</td>
<td>(0.58)</td>
</tr>
<tr>
<td>White</td>
<td>0.79</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Female</td>
<td>0.50</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Age</td>
<td>33.36</td>
<td>39.38</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.05)</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses.

Professional occupations are relevant codes in the Professional, Technical and Kindred Workers category.

All variables except income and age are binary.

Income is measured in thousands of dollars (2000).
Table 9: Fractionalization in the County of Birth and Occupational Choice

<table>
<thead>
<tr>
<th></th>
<th>1994 (1)</th>
<th>2000 (2)</th>
<th>1994 (3)</th>
<th>2000 (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fractionalization, 1860</td>
<td>-0.146</td>
<td>-0.163</td>
<td>-0.253</td>
<td>-0.316</td>
</tr>
<tr>
<td></td>
<td>(0.083)</td>
<td>(0.088)</td>
<td>(0.096)</td>
<td>(0.109)</td>
</tr>
<tr>
<td>White</td>
<td>0.031</td>
<td>0.045</td>
<td>0.047</td>
<td>0.059</td>
</tr>
<tr>
<td></td>
<td>(0.022)</td>
<td>(0.019)</td>
<td>(0.020)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>Female</td>
<td>-0.065</td>
<td>-0.023</td>
<td>-0.064</td>
<td>-0.021</td>
</tr>
<tr>
<td></td>
<td>(0.020)</td>
<td>(0.017)</td>
<td>(0.020)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>Age</td>
<td>0.0003</td>
<td>0.003</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Manufacturing share, 1860</td>
<td>--</td>
<td>--</td>
<td>-0.213</td>
<td>-0.521</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.172)</td>
<td>(0.213)</td>
</tr>
<tr>
<td>Agriculture share, 1860</td>
<td>--</td>
<td>--</td>
<td>-0.272</td>
<td>-0.431</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.144)</td>
<td>(0.160)</td>
</tr>
<tr>
<td>Population, 1860</td>
<td>--</td>
<td>--</td>
<td>0.018</td>
<td>0.011</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(0.017)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>Observations</td>
<td>1209</td>
<td>1122</td>
<td>1209</td>
<td>1122</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses are clustered at the county level.
Fractionalization is one minus the Herfindahl index of ethnic concentration, averaged across occupational categories.
White, female, and age are individual-level characteristics.
Manufacturing share in 1860 and agriculture share in 1860 are computed using IPUMS.
Population divided by 100,000.
Professional is a binary variable indicating whether the individual is employed in a professional occupation.
Professional occupations are relevant codes in the Professional, Technical, and Kindred Workers category.
Table 10: Fractionalization and Outcomes Related to Occupational Choice

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<td></td>
<td></td>
</tr>
<tr>
<td>Fractionalization, 1860</td>
<td>-0.388</td>
<td>-0.414</td>
<td>0.114</td>
<td>0.037</td>
<td>1.659</td>
<td>-11.722</td>
</tr>
<tr>
<td>(0.155)</td>
<td>(0.138)</td>
<td>(0.108)</td>
<td>(0.065)</td>
<td>(4.804)</td>
<td>(6.183)</td>
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</tr>
<tr>
<td>Manufacturing share, 1860</td>
<td>-0.071</td>
<td>-0.242</td>
<td>0.078</td>
<td>0.362</td>
<td>-1.195</td>
<td>-26.379</td>
</tr>
<tr>
<td>(0.305)</td>
<td>(0.260)</td>
<td>(0.230)</td>
<td>(0.136)</td>
<td>(10.268)</td>
<td>(12.231)</td>
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</tr>
<tr>
<td>Agriculture share, 1860</td>
<td>-0.171</td>
<td>-0.317</td>
<td>0.031</td>
<td>0.253</td>
<td>-8.197</td>
<td>-21.016</td>
</tr>
<tr>
<td>(0.311)</td>
<td>(0.222)</td>
<td>(0.164)</td>
<td>(0.107)</td>
<td>(7.808)</td>
<td>(9.359)</td>
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<tr>
<td>Population, 1860</td>
<td>0.021</td>
<td>0.065</td>
<td>-0.015</td>
<td>0.013</td>
<td>-0.210</td>
<td>0.449</td>
</tr>
<tr>
<td>(0.039)</td>
<td>(0.040)</td>
<td>(0.026)</td>
<td>(0.015)</td>
<td>(1.041)</td>
<td>(1.691)</td>
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</tr>
<tr>
<td>White</td>
<td>0.232</td>
<td>0.284</td>
<td>0.153</td>
<td>0.043</td>
<td>5.773</td>
<td>4.791</td>
</tr>
<tr>
<td>(0.048)</td>
<td>(0.052)</td>
<td>(0.024)</td>
<td>(0.021)</td>
<td>(1.850)</td>
<td>(1.567)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-0.014</td>
<td>-0.014</td>
<td>-0.155</td>
<td>-0.059</td>
<td>-11.986</td>
<td>-14.476</td>
</tr>
<tr>
<td>(0.017)</td>
<td>(0.024)</td>
<td>(0.021)</td>
<td>(0.015)</td>
<td>(1.122)</td>
<td>(0.988)</td>
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</tr>
<tr>
<td>Age</td>
<td>0.013</td>
<td>0.015</td>
<td>0.001</td>
<td>0.003</td>
<td>0.764</td>
<td>0.211</td>
</tr>
<tr>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.208)</td>
<td>(0.312)</td>
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<td>1437</td>
<td>1614</td>
<td>1332</td>
<td>1251</td>
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</table>

Note: Standard errors in parentheses are clustered at the county level.
Fractionalization is one minus the Herfindahl index of ethnic concentration, averaged across occupational categories.
Fractionalization is measured in the county of birth.
Manufacturing share in 1860 and agriculture share in 1860 are computed using IPUMS.
Population is divided by 100,000.
White, female, and age are individual-level characteristics.
Migrated is a binary variable that indicates whether the individual resides outside the county of birth.
Employed is a binary variable that indicates whether the individual currently holds a job.
Income is measured in thousands of dollars (2000).
Table 11: Fractionalization in the County of Residence and Occupational Choice

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Fractionalization, 1860</td>
<td>0.080</td>
<td>0.088</td>
<td>-0.053</td>
<td>0.067</td>
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</tr>
<tr>
<td></td>
<td>(0.073)</td>
<td>(0.070)</td>
<td>(0.078)</td>
<td>(0.075)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>0.073</td>
<td>0.066</td>
<td>0.090</td>
<td>0.063</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.019)</td>
<td>(0.015)</td>
<td>(0.020)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-0.062</td>
<td>-0.031</td>
<td>-0.062</td>
<td>-0.031</td>
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</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.017)</td>
<td>(0.016)</td>
<td>(0.017)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
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<td>-0.004</td>
<td>0.002</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing share, 1860</td>
<td>--</td>
<td>--</td>
<td>-0.321</td>
<td>-0.210</td>
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<tr>
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<td></td>
<td></td>
<td>(0.136)</td>
<td>(0.188)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture share, 1860</td>
<td>--</td>
<td>--</td>
<td>-0.183</td>
<td>-0.075</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.111)</td>
<td>(0.111)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population, 1860</td>
<td>--</td>
<td>--</td>
<td>0.055</td>
<td>-0.001</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.016)</td>
<td>(0.017)</td>
<td></td>
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<tr>
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<td>1130</td>
<td>1205</td>
<td>1130</td>
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</table>

Note: Standard errors in parentheses are clustered at the county level.
Fractionalization is one minus the Herfindahl index of ethnic concentration, averaged across occupational categories.
White, female, and age are individual-level characteristics.
Manufacturing share in 1860 and agriculture share in 1860 are computed using IPUMS.
Population divided by 100,000.
Professional is a binary variable indicating whether the individual is employed in a professional occupation.
Professional occupations are relevant codes in the Professional, Technical, and Kindred Workers category.
Table 12: Fractionalization and Educational Attainment

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>AFQT score (1)</th>
<th>high school completion (2)</th>
<th>college completion (3)</th>
<th>non-professional major (4)</th>
</tr>
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<tbody>
<tr>
<td>Fractionalization, 1860</td>
<td>-0.535</td>
<td>0.016</td>
<td>-0.095</td>
<td>0.207</td>
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<tr>
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<td>(7.457)</td>
<td>(0.100)</td>
<td>(0.104)</td>
<td>(0.107)</td>
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<tr>
<td>Manufacturing share, 1860</td>
<td>11.570</td>
<td>0.197</td>
<td>0.003</td>
<td>0.306</td>
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<td>(17.828)</td>
<td>(0.160)</td>
<td>(0.241)</td>
<td>(0.224)</td>
</tr>
<tr>
<td>Agriculture share, 1860</td>
<td>-3.015</td>
<td>-0.017</td>
<td>-0.261</td>
<td>0.327</td>
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<tr>
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<td>(14.672)</td>
<td>(0.143)</td>
<td>(0.193)</td>
<td>(0.229)</td>
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<tr>
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<td>-0.052</td>
<td>-0.018</td>
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<tr>
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<td>(1.981)</td>
<td>(0.023)</td>
<td>(0.023)</td>
<td>(0.040)</td>
</tr>
<tr>
<td>White</td>
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<td>0.083</td>
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<tr>
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<td>(1.626)</td>
<td>(0.024)</td>
<td>(0.018)</td>
<td>(0.048)</td>
</tr>
<tr>
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<td>0.000</td>
<td>-0.039</td>
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<td>(1.248)</td>
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<td>(0.020)</td>
<td>(0.022)</td>
</tr>
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<td>0.005</td>
<td>-0.002</td>
</tr>
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<td>(0.332)</td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.005)</td>
</tr>
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<td>2023</td>
<td>2023</td>
<td>1239</td>
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Note: Standard errors in parentheses are clustered at the county level.
Fractionalization is one minus the Herfindahl index of ethnic concentration, averaged across occupational categories. Fractionalization is measured in the county of birth. Manufacturing share in 1860 and agriculture share in 1860 are computed using IPUMS. Population is divided by 100,000. White, female, and age are individual-level characteristics. AFQT is the score on the Armed Forces Qualification Test. High school completion is a binary variable indicating whether the individual completed high school, including GED. College completion is a binary variable indicating whether the individual completed a four-year college/university degree. Non-professional major is a binary variable indicating whether the individual's college major is associated with a less mobile (non-professional) occupation.