A History of Violence:

The "Culture of Honor" as a Determinant of Homicide in the US South

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Abstract

This paper tests the hypothesis that the high prevalence of homicides in the US South stems from the fact that the region was settled by herders, chief among them the Scots and Scots-Irish. Herding societies tend to develop a "culture of honor" because violence is necessary to preserve a reputation for toughness in order to deter animal theft. Using historical census data and relating contemporary violence to early settlers and livestock counts, this paper confirms that high numbers of Scot or Scots-Irish settlers in the 19th century are associated with higher homicide rates today. The effect is strongest among whites and more pronounced in counties where herding was more prevalent and where institutional quality was lower in the 19th century. Different results are found in the North, which had stronger formal institutions than the South. Results indicate that the Scots-Irish culture of honor survived in the South as an adaptive behavior to both economic vulnerability and weak formal institutions. The relationship is likely causal. The results are robust to a wide array of socio-economic controls as well as controls for the influence of slavery and are robust to instrumental variable estimation. The same result is not found for other countries of origin or for offenses unrelated to a self-protection ethic.

Keywords: Homicide, Herding, Institutions, Migration, Scots-Irish, South.

JEL codes: K42, N31, O15, Z13

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"If defeated everywhere else I will make my last stand for liberty among the Scots-Irish of my native Virginia" George Washington

"The Scots-Irish were more prone to personal violence and more conscious of honor than any other group then[2] settled in the country" Bertram Wyatt-Brown (2001)

1. Introduction

The average murder rate per 100,000 people between 2000 and 2007 in the Deep South of the United States was 8.55, nearly twice as high as in the rest of the country.[3] The respective roles of economic and cultural factors in explaining such a high prevalence of homicide-related violence in the South are still the object of much debate. It has been acknowledged that the South's high murder rate cannot be explained by traditional socio-economic or institutional determinants of crime (Cohen and Nisbett 1994, 1996). The inelasticity of homicide rates to income levels has been interpreted as a limitation of cost-benefit analysis of criminal behavior[4] (Levitt and Miles 2006). More recent economic analyses of crime appear similarly unsuitable to explain the determinants of white offender homicide rates.[5] Some authors have suggested instead that the high Southern homicide rate is a product of cultural values condoning the use of lethal violence. While Hackney (1969) stresses the role of the defeat in the civil war in forming a distinct "Southern identity", Gastil (1971) and Wyatt-Brown (1982, 2001) highlight conditions in the pre-Civil war South, characterized namely by an "institutionalization of dueling" and an "exaggerated sense of honor".[6]

This paper reconciles economic and cultural theories of violent crime by highlighting the *economic* origins of the cultural factors underpinning interpersonal violence. The idea is that past ecological, economic and institutional conditions influence cultural values, which persist over time and underlie contemporary criminal behavior. Cohen and Nisbett (1994, 1996) hypothesize

[2] The author refers to the time period around President Jackson's (1767-1845) upbringing by his parents who had emigrated from Ulster in 1765.
[3] Source: Uniform Crime Reporting (UCR) Program Data by the United States Department of Justice and Federal Bureau of Investigation and author's calculations.
[4] Such as Becker (1968).
[5] For example, the analysis by Levitt (2004) and Levitt and Miles (2006) is focused on explaining the sharp decline of homicide rates in the 1990's. However, as illustrated in Figure 1, such a decline is confined to black offender rates.
[6] In Messner et al. (2005), p. 634.

that the root of the Southern culture of honor lies with economic differences that led to cultural differences. Whereas the North of the United States was settled by farmers, the South was settled by people from Scotland and from Ulster- the so-called Scots-Irish, whose livelihood was based primarily on herding.[7] The tendency of a herding society to develop a culture of honor, where any slight or insult leads to violence, has been described in the historical literature (Braudel, 1949; Pitt-Rivers 1966) and the anthropological literature (Edgerton 1967).[8] A herder's livelihood is precarious in a way that a farmer's is not: he can easily lose most of his wealth through theft. Aggression and a willingness to kill can be essential to build a reputation for toughness and deter animal theft.

To investigate this hypothesis, this paper uses historical census data on early settlements to the United States and examines how much and under what circumstances Scot or Scots-Irish settlements in the late 18th and early 19th century and their herding activities explain contemporary homicide. Since most settlers from Ireland prior to the 1840s' Potato Famine were Presbyterian Ulster Scots, I identify the Scots-Irish settlers from the first US census in 1790. For robustness and to increase the population size, Presbyterian US natives in the 1900 census are also used as a proxy for the Scots and Scots-Irish. Contemporary county level homicide data comes from the Uniform Crime Reporting (UCR) Program Data by the United States Department of Justice and Federal Bureau of Investigation. Results confirm that high numbers of Scot or Scots-Irish settlers are associated with higher homicide rates today. The effect is strongest among whites and more pronounced in counties where herding was more prevalent. It is more likely that homicides perpetrated in defense of one's reputation involve people who, although not directly related, know one another. Accordingly, the results are specific to violence between acquaintances as opposed to violence between strangers or love related homicides.

[7] The average homicide rates in Scotland and Northern Ireland between 2003 and 2007 were, respectively, 2.3 and 1.92 per 100,000. In comparison, the homicide rate in England and Wales was 1.5, in France: 1.5 and in Germany: 0.92.

[8] Edgerton (1967) describes natural experiments where two tribes living in the same region of East Africa but differing in their economic occupations display different tendency for violence and warfare. Fernand Braudel (1949) describes the mountainous herding people of the Mediterranean rim, their reputation for violence and warfare and the lack of order and hierarchy in such societies. The limitations of law enforcement on mountainous terrain fail to deter thieving, thereby creating favorable conditions for the prevalence of "private" law, also described as "machismo" (Edgerton 1967) or "lex talionis" (Cohen and Nisbett 1996). In Sardinia, data collected by Luigi Guiso show a strong correlation between sheep per capita and homicide rates. Murder rates in Northern Ireland

The Nisbett and Cohen hypothesis predicts that the North-South difference in homicide rates is due to pastoralism among the Scots-Irish relative to other settlers and the greater presence of the Scots-Irish in the US South. The results in this paper illustrate something different. Scot or Scots-Irish presence explains violence in the South only. Differences in pastoralism also only matter in the South and when present simultaneously with Scot or Scots-Irish presence. In other words, the culture of honor only survived in the South. The question that arises and that is investigated next is: What is the nature of such cultural selection?[9] Wyatt-Brown (2001) depicts how in the North, formal and impersonal institutions quickly substituted for the ethic of honor as the cement of social and political order in the 19th century. A reason why the culture of honor only survived in the South may have to do with the weakness of the institutional environment, which provided the fertile ground for the reliance on violent private justice. Leeson (2009) describes how the Scots-Irish culture emerged as a response to the lawlessness, intergroup banditry and large-scale cattle theft that characterized for centuries the Anglo-Scot border where the Scots-Irish originated from. In the absence of formal law enforcement, honor and reputation were of central importance and provided the main enforcement mechanism of customary law.[10] In the frontier South, also a lawless environment, such informal institutions may have provided the best adaptive response and became the prevailing norm.

I follow Besley and Prat (2006) and Gentzkow et al. (2006) and use data on newspaper circulation in 1840 as a proxy for institutional quality and political competition. I find not only that institutional quality is directly associated with reduced violence but also that it severs the link between Scot or Scots-Irish presence and homicide. Also, evidence suggests that the culture of violence was indeed 'selected' as a cultural norm and was internalized by Southerners. Even outside the South, the higher the proportion of migrants from the South is, especially from Southern states that had a high intensity of Scot or Scots-Irish settlements, the higher the homicide rate is today. Alternative channels of cultural transmission are investigated next in

[9] By the term selection, I mean the process of "natural selection of cultural variations" in the sense of Boyd and Richerson (2005, page 76) and not selection as traditionally understood by economists. Boyd and Richerson (2005) argue that the logic of natural selection applies to cultural traits: "Cultural variation affects people's behavior in ways that affect the probability that they transmit their beliefs to others" (page 76). Such "others" can be children or peers. Indeed, in addition to vertical transmission of cultural traits from parents to children, which operates in an identical way to the natural selection of genes, another transmission process affects the selection of cultural traits: horizontal transmission, which operates through learning and imitation.

[10] For example, individuals who did not conform to customary law were publicly denounced and challenged to duels, a practice called "bawling".

order to explain how Scots-Irish cultural traits have become a prevailing social norm (see Bisin and Verdier 2008 for a review of the literature on cultural transmission). First, oblique or horizontal socialization through peer effects and learning implies that the initial culture of the Scot and Scots-Irish settlers still prevail in certain areas of the South because other settlers, regardless of their origin, improved their fitness by adopting such violent cultural traits. Indeed, settlers from other countries of origin are found to be associated with more violence in counties where the proportion of Scots and Scots-Irish was higher. Second, vertical socialization from parents to children implies that agents internalize cultural norms within families, so that even today, Americans of Scots-Irish ancestry should display cultural traits consistent with a culture of honor. I test whether homicide rates are higher today in counties with high proportions of Americans of Scots-Irish ancestry, as self-reported in the 2000 Census.[11] This is true only in the South and West. I also find evidence of vertical transmission, among Southerners of Scots-Irish ancestry, of a value system that is consistent with the prevalence of private justice and that is characterized by strong beliefs in self-reliance and a mistrust of centralized institutions.

The effect of the Scot and Scots-Irish presence in the Southern United States on contemporary homicide rates is sizeable. Controlling for a wide number of contemporary socio-economic and demographic characteristics as well as for the influence of slavery, every extra hundred Scot or Scots-Irish settlers in a county of the Deep South in 1790 is associated with an increase in the yearly homicide rate by 13% overall and by 18% for white offenders (for counties in the Deep South, the average number of Scot or Scots-Irish settlers in 1790 is 412 and the average total population is 12,256).

An alternative explanation to the results is that the Scots and Scots-Irish migrated to counties, the characteristics of which still lead to a high prevalence of homicides. It could be the case, for example, that they migrated to Southern counties where slavery was also high, and this confounds the relationship discussed in this paper. Several strategies are pursued in order to establish the causal relationship between Scot or Scots-Irish settlements and homicide related violence. First, the results are robust to controlling not only for the influence of slavery but also for lawlessness and other determinants of crime, such as poverty, inequality, racial composition or ethnic fractionalization. Second, several falsification tests are performed. The positive

[11] The proportion of Americans of Scots-Irish ancestry is slightly higher in the Deep South and the West (1.8% to 2%) compared to the rest of the country (1.47%).

relationship between early settlers and contemporary homicides in the South does not hold for settlers that originated from countries where farming was more developed, such as England, Holland, Germany or France or for other religious denominations in 1900. Nor does it hold for other violent crime unrelated to a self-protection ethic. Third, the approach by Altonji, Elder and Taber (2005) and Nunn and Wantchekon (2009) is used to calculate how much greater the influence of unobservable factors would need to be, relative to observable factors, to explain away the full positive relationship between the Scots-Irish settlers and contemporary homicides. It is highly unlikely that the estimate can be fully attributed to unobserved heterogeneity. Last, results are robust to the instrumentation of Southern settlements by the physical distance to Shallow Ford, a major crossroads on the settlers' historical road to the backcountry.

Section 2 provides some historical background. Section 3 presents the data and descriptive statistics. Section 4 presents the empirical methodology and the results, the robustness of which is investigated in Section 5. Section 6 discusses the determinants of selection of the culture of honor in the South and cultural transmission channels. Section 7 concludes.

2. Historical Background

The theory developed by Cohen and Nisbett deals with settlers from the fringes of Britain, areas not suitable for intensive farming, and most particularly the "Scots-Irish". The term "Scots-Irish" was coined in the US in the 19th century to differentiate the Protestant –mainly Presbyterian- people from the Irish northern province of Ulster, the Ulster Scots, from the Catholic Irish. The Ulster Scots originated from the Anglo-Scot borderlands, which extended from the River Cree to the North Sea on the Scottish side and from the coast of Cumberland to the coast of Northumberland on the English side. The marshes were a conflict-ridden and lawless environment and the borderers "embraced banditry as a way of life […]: unlike common bandits, for them raiding, arson, kidnapping, murder and extortion were an important part of the social system" (Leeson 2009, p. 477). The "border reivers" were resettled to Ulster after James VI of Scotland became James I King of England in 1603. The objective of this "Plantation" was to bring peace to the Anglo-Scot borderland and provide fighting men to suppress the native Irish.

Prior to the 19th century, the vast majority of migrants from Ireland consisted of Ulster Scots. Protestants were only one-third of the population of Ireland, but represented three-quarters of all

emigrants leaving between 1700 and 1776 (Adamson 1982). Their migration was completed over the course of the 18th century. It is estimated that over 200,000 Ulster Scots migrated to the Americas between 1717 and 1775 due to religious and economic discrimination (Adamson 1982). According to Harris (2006, page 507), even after the Glorious Revolution, "the Protestant squirearchy who dominated the Irish Parliament […] showed themselves almost as concerned by the threat of Protestant dissent and especially the Scottish Presbyterians in Ulster, as they were about popery". Things were particularly difficult for the Presbyterians in the last years of Queen Anne's reign. In particular, the 1704 English Test Act required all office-holders in Ireland to take the sacramental test. Presbyterians could no longer serve in the army, the civil service, teaching professions or the police. The Navigation Act had prohibited all exports from Ireland to the colonies and the export of Irish cattle to England since 1660.[12] Around the turn of the century, additional restrictive economic laws were passed. In 1699, the English parliament prohibited wool or woolen goods exports from any Irish ports except Drogheda, Dublin, Waterford, Youghal, Cork and Kinsale, none of which is in Ulster. Last, the practice of rack-renting by landlords, the majority of whom were English, led to exorbitant land rents in Ulster. All of these enactments were particularly detrimental to the Ulster Scots and provoked a first mass migration to the New World at the beginning of the 18th century. They first settled in New York, where they founded the Orange and Ulster counties. The first wave of migration to Pennsylvania occurred in 1717-1718. By 1738, Ulster Scot settlers had made their way from Pennsylvania into Virginia. Three subsequent waves of migration occurred in 1739-1740, 1754-1755 and 1771-1775.

Other important groups of settlers around the same time were Highland Scots, driven from their homeland by the defeat of Bonnie Prince Charlie (Charles Edward Stuart) in 1745, as well as Germans and Dutch. As a late and impoverished arriving group, Ulster and Highland Scots and, to a large extent, the Germans, found land in the coastal areas of the English colonies already owned or too expensive and left for the back country on "The Great Philadelphia Wagon Road", along the Appalachian Mountains southward to the Carolinas. The hilly terrain reinforced herding as the basis of the economy of the Scots and Ulster Scots: it was often unsuitable for

[12] A prohibition made permanent in 1666.

intensive agriculture, and even when it was, they tended to farm in low efficiency horticultural fashion.[13]

Although migration from Ireland consisted primarily of Ulster Scots prior to the 19th, the mass migration that followed the 1840s' Irish Potato Famine consisted mainly of Irish Catholics whose cultural and economic bases were very different. This newer wave of Irish Catholics often worked as laborers and tradesmen and typically settled at first in the coastal urban centers, although many migrated to the interior to labor on large-scale 19th century infrastructure projects. Their interactions with the –rural based- Ulster Scots were very rare.

Anecdotic evidence on the ruthlessness and violence of the Scots-Irish and the Scots in the Southern United States abound. Wyatt-Brown (2001) namely describes how the upbringing of President Andrew Jackson by his Scots-Irish parents nurtured his acute sense of honor, which made him the epitome of the Southern culture of honor (Wyatt-Brown, 2001, chapter 3). He writes that: "The Scots-Irish were more prone to personal violence and more conscious of honor than any other group then[14] settled in the country". McDonald and McWhiney (1975) also recount how "[the Scots-Irish herdsman] is deadly if provoked, and the readiest way to provoke him is to treat him or his kin disrespectfully; he never forgot or forgave an insult" (page 166). A contemporaneous witness of the Scots-Irish settlements, St John de Crevecoeur described how: "The Irish […] love to drink and to quarrel; they are litigious, and soon take to the gun" (St. John de Crevecoeur 1782, Letter 2). Historical crime data from the 18th century support this depiction. Roth (2009) reports that the Irish represented less than 4% of the population but 13% of homicide assailants in New England and Virginia between 1676-1800. The Scots were nearly as violent: they represented 20% (New England) to 26% (Virginia) of homicide assailants but only 12% of the population. Similarly high ratios of homicide assailants to population of Scots and Irish settlers persisted in the 19th century. Homicide rates were high too, at about 13.6 per 100,000 colonists in the Shenandoah Valley of Virginia between 1645 and 1775 (Roth 2009).

[13] Cohen and Nisbett (1996), page 8.

[14] The author refers to the time period around President Jackson's (1767-1845) childhood.

3. Data on Crime and History and Descriptive Statistics

3.1.Data

- Crime data:

Crime data comes from the Uniform Crime Reporting (UCR) Program Data by the United States Department of Justice and Federal Bureau of Investigation. The unit of observation is the monthly count of occurrences of different offenses in each reporting agency. The UCR data provide information on 43 offenses and the counts of arrests by age, sex, and race for each offense in more than 17,000 reporting agencies throughout the country. With the data on arrests by age, sex and race and the number of offenses, it is possible to link offenses to the characteristics of a person arrested. The process is however not perfect: there is no information on conviction and the number of arrests does not always coincide with the count of offenses. When this is the case, the minimum value between arrests and offenses is considered. This results in a lower number of total offenses by categories of offenders than the total count of offenses.

The main offense of interest to test the culture of honor hypothesis is "Murder and non-negligent manslaughter". Ideally, one would like to analyze criminal behavior of offenders of different ancestries, but arrest data does not include such information. Only the race of the offender is known. Homicide by white offenders is retained as the main dependent variable of interest.[15] The white offender homicide rate is defined as the number of homicides for which a white offender has been arrested as a percentage of the white population. Data on aggravated assaults and other types of violent crime or offenses are also retained.

More precise information on the type of homicide is available from the Supplementary Homicide Reports (SHR) of the Uniform Crime Reporting data. The SHR provide information on the relationship between offenders and victims of murders and non-negligent manslaughter, as well as the weapon used and the circumstances of the crime.

The number of agencies reporting to the UCR and SHR has been increasing over the years since the start of the program in the early 1980s. For this reason, the analysis relies mostly on more

[15] This is the approach in most of the literature, such as Cohen and Nisbett 1994, 1996; Rivera et al. 2002, Henry 2009, among others.

recent data, for 2000-2007. The unit of observation is a county. Data is available in 2499 counties. [16]

The UCR data is merged with the 2000 census to obtain crime rates per 100,000 people. Potential determinants of crime, such as demographic and socio-economic characteristics, namely aggregate earnings, proportion of people living at or below the poverty line, proportion of people living in urban areas, ethnic fragmentation and Gini coefficients are obtained from the 2000 US census.

The average crime rate per 100,000 people in 2000-2007 is 5.8. States with the highest crime rate are North and South Carolina and the lowest are Maine and New Hampshire.[17] The most violent county is Kenedy County in Texas, followed shortly by Clay and Taliaferro counties in Georgia. The homicide rate by white offenders is 2.5 per 100,000. This is more than twice the average *total recorded* homicide rate in the EU-12.[18] [19]States with the highest white offender homicide rates are Arizona and California, and the states with the lowest: Kentucky and South Dakota. All descriptive statistics are in the Appendix.

- Historical data:

Historical census data is from the National Historical and Geographical Information System and IPUMS (Ruggles et al. 2010). The first US census was recorded in 1790. Censuses were then carried out every ten years. However, not all census waves contain information on countries of origin and the first census to contain such information after the 1790 census is in 1870.[20]

As detailed in Section 2, the settlement of Ulster Scots in the US was roughly completed by 1775. The ensuing massive emigration from Ireland to the United States consisted of culturally very different people, mainly Catholics from the South of Ireland. In order to identify the Scots-Irish, the analysis relies on the 1790 census. The 1790 census records information on countries of origin, age, family sizes and slaveholding in 286 counties. Information on the country of origin is available only in 150 counties in 11 states according to the 1790 states boundaries, 13 according

[16] The results are robust to using earlier data from 1985 to 2000.
[17] Alaska and Hawaii are excluded.
[18] The comparison of the two figures is a lower-bound estimate of the difference since unsolved crime is not considered in the US number but is in the EU-12 number.
[19] The source of data on EU crime rate is the UNODC.
[20] Then the 1900 and 1910 census, 1930, 1960, 1980 and every ten years after that.

to contemporary boundaries.[21] [22] Table A1 lists the number of immigrants from each country of origin listed in the 1790 census, by state, as well as the total 1790 population. Census data is matched to crime data and a match is obtained for 150 counties. Among these counties, the most violent counties are in South Carolina: Marlboro for overall homicide and Orangeburg for homicides by whites.

Cohen and Nisbett formulate the culture of honor hypothesis in relation to the Scots-Irish most particularly but generally to all "people from the fringes of Britain" (Cohen and Nisbett, 1996, page 7) that is, not only Ulster, but also Scotland and Wales. The 1790 census records as countries of origin of settlers: "England and Wales", "Ireland", "Scotland", "France", "Holland", "Hebrew" and "All other nationalities". An important drawback is that the Welsh settlers are not distinguished from the English, who are the majority in this group. For this reason, the Welsh are ignored from the analysis. In the rest of the paper, due to their cultural similarities, the main group of interest is the Scots grouped together with the Ulster Scots and is referred to as "Scot or Scot-Irish" in all that follows. Results specific to the Irish only are also discussed throughout.[23]

Census waves before 1840 only contain core demographic information. 1840 is the first census year in which important information on economic, farming and herding activity is recorded. Hog and sheep were the traditional animals herded by the Scots-Irish (McDonald and McWhiney 1975). Data on herds of pigs and sheep are matched to the 1790 census ancestry information in 148 counties.

The main drawback of the 1790 census is the small population size. For robustness and to increase the population size, the analysis is also performed on the 1900 census. The 1900 census does not contain information on ancestry, but records information on religious denominations in 2799 counties. Presbyterian US natives in 1900 are used as a proxy for the Scots-Irish settlers of the 18th century. Of course, settlers from other backgrounds may also have been members of the Presbyterian Church and this is an imperfect measure. Still, Table B1 presents correlation coefficients between members of different Presbyterian denominations and the number of Scots-Irish settlers from earlier Censi. Members of the Presbyterian Church in the USA correlate best

[21] Some counties were carved out or Massachusetts and Virginia and reallocated to, respectively, Maine and West Virginia at the creation of these two states in 1862 and 1820.
[22] The 13 States are Connecticut, Maryland, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia and West Virginia.
[23] Detailed regression results soon available on the author's website.

with the 1790 Scots-Irish population and other proxies for Scots-Irish settlements. White native members of the Presbyterian Church in the USA are therefore used as a proxy for the 1900 descendents of the Scots-Irish settlers.

3.2.Descriptive Statistics: Relationship between homicides and early settlers

Figure 2 plots the relationship between the county average annual murder rate per 100,000 people, overall (panel a) and by white offenders only (panel b) between 2000 and 2007 and the number of settlers of Irish or Scottish origin in 1790. Different scatter plots and linear fits are reported for the whole population (full line) and for each of the three regions: Deep South (long dash), Border South[24] (short dash) and non-Southern states (dotted line). It appears that the relationship between homicides and Scot or Scots-Irish settlers is of a different nature in the Deep South compared with the rest of the country. In the Deep South, contemporary homicide is higher in the counties with more numerous Scot or Scots-Irish settlers in the 1790. The same holds true for settlers from Ireland.

The distinctively positive relationship between homicide rates and early settlers in the Deep South does not hold when either settlers of other countries of origin or other violent crime are considered (see Figures 3 and 4). This will be confirmed by regression analysis.

4. Empirical Specification and Results

4.1. OLS Baseline Estimates: Scot or Scots-Irish settlers and violence

While the above graphs are an informative starting point, a more formal regression set up makes it possible to control for a number of other determinants of contemporary crime, such as socio-economic and demographic county characteristics.

As the starting point of the analysis, contemporary homicide rates are regressed on the number of early Scot or Scot-Irish (and Scot-Irish only) settlers in 1790, a wide array of socio economic and demographic controls and regional dummies for the Deep South, Border South and non-Southern states. The second main specification includes an interaction term between settlers and regional dummies.

[24] The Border South includes Kentucky, Maryland, Oklahoma, Tennessee, Washington D.C., West Virginia and Delaware and the Deep South: Alabama, Arkansas, Florida, Georgia, Louisiana, North Carolina, South Carolina, Texas, Virginia.

The two baseline equations are:

$$m_c = \beta_0 + \beta_1 SI_c + \beta_2 BS_c + \beta_3 DS_c + \beta_4 X_c + e_c \quad (1)$$

$$m_c = \beta_0 + \beta_1 SI_c + \beta_2 BS_c + \beta_3 DS_c + \beta_4 SI_c * BS_c + \beta_5 SI_c * DS_c + \beta_6 X_c + \varepsilon_c \quad (2)$$

where m_c is the average annual homicide rate per 100,000 people[25] between 2000 and 2007 at the county level. The overall homicide rate and the white offender homicide rate are considered in turn as the dependent variable in the main specification. SI_c is the number of settlers from Scotland and Ireland at the county level from the 1790 census. Alternative specifications with settlers from Ireland only are discussed throughout. In all specifications, the county population in 1790 is included as a control. An alternative is to include directly the proportion of Scots or Scots-Irish settlers as the main independent variable. However, the proportion variables are noisier and more skewed to the right. Results are nevertheless robust to using proportions as the main independent variable, as well as using log-log or log-linear specifications (see Table C1 in Appendix). BS and DS are regional dummies for Border South and Deep South respectively. The excluded regional category is non-Southern states. X_c include, in addition to the 1790 county population, contemporary socio-economic and demographic characteristics from the 2000 census at the county level, such as aggregate earnings, the proportion of the population at or below the poverty line, the racial composition at the county level, the proportion of population in urban or rural areas, the Gini index or the ethnic fractionalization index. [26]

Table 1 presents the baseline estimates. Panel (a) presents the results for all homicides and Panel (b) for homicides by white offenders only. The first column in Table 1 includes settlers only, column 2 regional dummies only (for Deep South, Border South and Northern states, the excluded category) and column 3 settlers and regional dummies together. The results confirm the Southern homicide specificity for total homicide: dummies for Border South and for Deep South are both significant and positive, with a larger coefficient for the Deep South dummy.[27] However, the coefficient on Scots-Irish settlers is not significant.[28] Hence, differences in the

[25] Based on 2000 county population recorded in the 2000 census.
[26] I thank Giulio Zanella for raising concern about the potential impact of fractionalization and sharing some data.
[27] In this restricted sample, the Deep South dummy is not significant for white homicide rate, but it is strongly so (and positive) in the sample of all counties in the US.
[28] Similar results are obtained for Irish only settlers.

presence of Scots or Scots-Irish settlers per se do not contribute to explain the North-South difference in homicide rates.

Column 4 includes, in addition to respective main effects, the interaction term between regional dummies and the number of Scots-Irish settlers. The interaction term between Deep South and Scots-Irish settlers is positive and highly significant, both for the total homicide rate and for the homicide rate by white offenders only. The same holds true when settlers from Ireland only are considered or when the South as a whole (including Border states and the Deep South) is considered. Moreover, when the interaction is included, the coefficient on the Deep South dummy loses significance and actually becomes negative once additional controls are included. The effect of the interaction term is robust to the inclusion of the full set of contemporary socio-economic and demographic composition controls in Column 5. The results are also robust to controlling for terrain characteristics at the county level, such as mean elevation, differences in elevation and total area as well as for 1790 population density and ethnic fragmentation (considering each country of origin and black population as distinct groups in the construction of the fragmentalization index). [29]

The effect of the interaction term between Scot or Scots-Irish settlements and Deep South on homicide rate is far from negligible. The value of the coefficient of the interaction between Scot or Scots-Irish settlers and Deep South is 0.652, for the overall homicide rate, and 0.164 for homicide by white offenders. Every extra hundred Scot or Scots-Irish settlers in a county of the Deep South in 1790 is associated with a 10% increase in yearly homicide rates (for counties in the Deep South, the average number of Scot or Scots-Irish settlers is 412 and the average total population is 12,256).[30]

The goodness of fit of the full specification of the baseline equation is satisfactory. Information on settlers' regional distribution together with current socio economic and demographic characteristics explains about 50% of the variation of homicide rates across counties. As expected, poverty rates are positively associated with homicide rates although the influence of

[29] Results not reported here but available upon request. I thank Stelios Michalopoulos for providing terrain data.
[30] Standardized 'beta' coefficients are 0.53 and o.60 for the overall homicide rate and homicide rate by white offenders, respectively.

poverty on homicide is explained away by information on racial composition.[31] The proportion of the population living below or at the poverty line and the proportion of blacks at the county level are indeed highly correlated: the correlation coefficient is 0.53 for the population of 150 counties and 0.76 in the Deep South counties.[32] More urbanized counties experience lower homicide, but the effect is not significant when included together with poverty rates, since urban counties are richer (the correlation coefficient between urban rate and the log of aggregate earnings is 0.83).

Similar results are obtained using Presbyterian natives in the 1900 Census as a proxy for Scots and Scots-Irish settlers. Native white Presbyterians are significantly associated with higher homicide rates, overall and by white offenders, but only in the Deep South. Table B2 in Appendix B presents results of specifications (1) and (2) for the whole population (2799 counties). Similar results hold when only the subsample of Northern, border and Deep Southern states is considered (1469 counties, 933 of which in the Deep South).

Next, the Supplemental Homicide Report (SHR) data is used in order to provide more details on the most common type of homicide in counties with larger Scot or Scots-Irish settlements. The SHR provides information on the relationship between offender and victim. Cultures of honor are characteristic of societies based on kinship. It is more likely that homicides perpetrated in defense of one's reputation involve people who, although not directly related, know one another. This is confirmed by regression analysis. It is specifically homicides involving non-family related acquaintances that are more likely in counties with high proportion of Scots and Scots-Irish in 1790. By contrast, love related homicides are not more likely in such counties. Results are displayed in Table 2.[33]

4.2. The Herding Base of the Culture of Honor

Cultures of honor prevail in pastoralist societies (Braudel, 1949; Edgerton 1967; Pitt-Rivers 1966). A herder's livelihood is precarious in a way that a farmer's is not: he can easily lose most

[31] Regression results with each control included separately are not reported here but are available from the author upon request. Results are also robust to the inclusion of interaction terms between the regional dummies and all other control variables.

[32] It is much higher in this sample of 150 counties than in the sample of all US counties. For the sample of 3140 counties, it is 0.40 and 0.49 in the Deep South, both significant at the 1% level.

[33] Love related homicides are defined through the relationship between offender and victim. They are the homicides committed by boyfriends, girlfriend, lover, husband, wife or ex-s.

of his wealth through theft. Aggression and a willingness to kill can be essential to build a reputation for toughness and deter animal theft. Data on livestock counts at the county level from the 1840 census is matched to settlers' country of origin data in order to test whether the link between Scot or Scots-Irish settlers and homicide is associated with herding activity in the early 19th century. A similar approach is performed on the 1900 Census, which also contains information on herding.

First, livestock counts are first included as an independent in order to investigate to what extent herding itself contributes to homicide. Second, an interaction term between herding and the Deep South is included to capture to what extent herding explains violence within the South. The specifications are thus identical to (1) and (2) above, but with livestock counts instead of Scot or Irish settlers. Third, a three-way interaction between the number of Scot or Scots-Irish settlers (or Scots-Irish only), the number of sheep and pigs per capita and a Deep South dummy, controlling for any two-way interactions between the variables, is included. The nil hypothesis is that the coefficient on the three-way interaction is not significantly different from zero. Rejecting the nil would confirm the herding origins of the culture of honor in the South and point to the complementarity between Scot or Scot-Irish cultural background, economic factors (herding) and the institutional environment of the South as determinants of violence.

Columns 1, 2, 5 and 6 of Table 3 explore the effect of herding alone. Herding on its own does not contribute to violence in general, or in the South relatively to the North, or even within the South. Quite to the contrary, in the Deep South, herding is negatively associated with homicide rates. The remaining columns include an interaction between Deep South, Scot or Scot-Irish settlers and counts of pigs or sheep per capita. This interaction term is positively and significantly associated with murder rates today, both overall and by white offenders. In all specifications, the sum of pigs and sheep per capita is included, but individual results with either animal are similar.[34] By contrast, a similar interaction with agricultural output is never significantly associated with homicide rates.

Similar results are obtained on the population of Presbyterian natives in the 1900 Census. The interaction term between Deep South, Presbyterians and the number of sheep and pigs per capita is significantly associated with higher homicide, overall and by white offenders (Table B3).

[34] Similar results are obtained for overall cattle counts and for Scots-Irish settlers only.

To sum up, the results establish a link between lethal violence and early Scots and Ulster Scots settlers, but only within the South. The results also confirm the herding origins of the culture of honor: a higher intensity of Scot or Scots-Irish settlements at the county level is associated with higher murder rates today, all the more so in counties where herding was more prevalent. Again, this is true in the South only. This contrasts with the hypothesis spelled out by Nisbett and Cohen: it is not herding or cultural background alone that explains the distribution of homicide but the interaction between such characteristics and the South. The role of institutions in explaining the selection and prevalence of the culture of honor in the South is discussed in Section 6. However, at this point, the results do not unequivocally establish the causal impact of the Scot and Scots-Irish culture on homicide. This is the object of the next Section.

5. Identifying Causal Relationships

5.1. Selection on Observables: Robustness to Slavery

Slavery is another explanation for the high prevalence of violence in the South that has been discussed extensively. Of course, it is not contradictory and may be complementary to the culture of honor hypothesis. Nevertheless, it is necessary for the robustness of the above results to ensure that the relationship between Scot or Scots-Irish settlers and homicides is not confounded by slavery. It would indeed be worrying if counties with high headcounts of Scots and Scots-Irish were also the counties where slavery was most widespread. This is however unlikely to be the case: according to McDonald and McWhiney (1975), the majority of the Scots-Irish neither owned slaves nor did they aspire to, given that herding was very profitable. The correlation between Scots or Scots-Irish settlements and slave numbers at the county level is indeed negative and significant at the 10% level (Table B1). Still, it is useful to check in regression analysis whether the relationship illustrated in Section 4 still holds when the number of slaves in each county in 1790 is included. This is done in Table 4. The interaction term between Scot or Scots-Irish settlers and Deep South still has a positive and significant effect on contemporary homicide rates when slavery is controlled for. Actually, the coefficient is even more economically and statistically significant when slavery is controlled for. Results are unchanged whether slaves only or the total black population are considered. Accounting for the influence of slavery, every extra

hundred Scot or Scots-Irish settlers in a county of the Deep South in 1790 is associated with an increase in the yearly homicide rate by 13% overall and by 18% for white offenders

It is also notable that Scot or Scots-Irish settlers to the South do no longer explain homicides by black offenders when the black population in 1790 is controlled for.[35]

All regressions with the 1900 Census presented in Appendix B include ethnic composition of the counties in the 1900 census.

5.2. First Falsification test: Does the relationship between homicides, South and early settlers hold for other countries of origin?

The above results do not provide sufficient evidence to establish the claim that the specific cultural and economic background of a certain type of settlers caused higher homicide rates. One needs to show that the relationship between homicide and early settlers in the South holds for the Scots or Scots-Irish specifically and not for any country of origin of settlers. Else, the results may have nothing to do with a specific cultural background, but rather to the specificities of the US South and/or the type of settlers it attracted, regardless of their cultural background.

Additional specifications include as the main independent variable of interest settlers from other countries of origin in the 1790 Census and other religious denominations in the 1900 Census. The nil hypothesis is that the interaction term between Deep South and country of origin is not significant for any country of origin other than Scotland and Ireland. Failure to reject the nil would cast doubt on the main proposition of this paper.

Table 5 presents the results of specification (2) where settlers from countries other than Ireland and Scotland, such as France, Germany, Holland, or England and Wales are considered. Their presence in the Deep South is never significant in explaining homicide rate by white offenders (Columns 1 to 4) or homicides in which the offender and the victim are acquaintances (Column 5). Similar results are obtained using the 1900 Census: the interaction between Deep South and any other religious denominations apart from Presbyterians is never significantly and positively associated with homicide rates, overall or by white offenders (Table B4).

The interaction between herd counts and early settlers from other countries of origin is never significantly associated with higher homicide rates today (Table 6). In other words, the

[35] Results relating to black homicide rates not displayed here but available upon request.

prevalence of herding explains higher homicide rates only when associated with Scot or Scots-Irish presence specifically.

In sum, the relationship between early settlers and the contemporary high homicide rate by whites in the South is specific to the Scots and Scots-Irish. This provides support for the main proposition of this paper in two ways. First, it indicates that it is something specific to the cultural background of a specific group of settlers that is at play in explaining high levels of homicide. Second, and equally important, rejecting the nil suggests that there is not something specific to the Southern United States, which would for example stem exclusively from geography, which explains high levels of homicide. Indeed, high homicide rates, particularly by white offenders in the South cannot be explained exclusively by the particularities of the South, but instead by the interaction between the particularities of the South *and* the cultural background of a specific type of settlers.

5.3.Second Falsification Test: Other types of violent crime

The culture of honor is a self-protection ethic, whose purpose is the defense of a reputation. It should thus act as a determinant of homicide, as established above, and of aggravated assaults, which is confirmed by the regression results displayed in Table A4, but not of any type of violent act. The rationale for this falsification test is to verify that the relationship between violence and Scot or Scots-Irish settlements in the South does not derive from a highest propensity of the Scots-Irish towards violence in general but towards a specific type of violence aimed at protecting one's reputation. The nil hypothesis is that the interaction term between Scot or Scots-Irish setters and Deep South does not significantly explain other violent crime unrelated to a self-protection ethic.

Table 7 presents the results of a regression in which the outcome variable is the annual average rape rate committed by white offenders per 100,000 people. There is no significant relationship between Scot or Scots-Irish settlers in the South and rape by white offenders. Similarly, the interaction between intensity of Scot or Scots-Irish settlements in the South and herding is never significantly associated with rape (Table 8).

Similar results are obtained with the 1900 Census. The interaction terms between Presbyterians and Deep South, or between Presbyterians in the Deep South and herding is never significantly associated with rape, overall or by white offenders (Table B5).

5.4. Robustness to Lawlessness

Even though no legacy of Scot or Scots-Irish settlements on another type of violent crime unrelated to a self-protection ethic was found, it could still be the case that the counties in which the Scots and Scots-Irish settled experience higher levels of general crime, which in turn could lead to more homicide. If the legacy of Scots-Irish settlements was crime in general – and not only lethal violence – the effect on homicide rates should not be robust to additional controls for contemporary crime. In Table 9, other measures of crime and offenses are included as additional controls in the baseline specification described in Section 4. For example, homicides may be higher because of differences in the propensity to carry weapons, so offenses related to weapon carry are included. Also, property crime may be higher, and homicides associated with property crime could drive the result, so arrests for robberies and burglaries are controlled for. Note that this is unlikely to be the case as it was already established that the driver of the result was homicides between acquaintances.

Individual controls for the rate of weapon carry, property crime (burglaries and robberies) as well as drunkenness offenses are included, first individually, then together. For homicides by white offenders, included controls are other offenses committed by whites only. All regressions control for the full set of contemporary socio-economic and demographic controls and the county population in 1790. The effect of Scot or Scots-Irish only settlements on homicide rates is robust to the inclusion of all these controls and remains significant at the 1% level when all controls are included together.[36]

5.5.Selection on unobservables

Following Altonji, Elder, and Taber (2005) and Nunn and Wantchekon (2009), ratios are computed that reflect how much greater the influence of unobservable factors would need to be, relative to observable factors, to explain away the full positive relationship between the Scot or Scots-Irish settlers and contemporary homicides. Table 10 reports the ratio of coefficients of regressions including full or restricted sets of coefficients. In many cases, the ratio is actually negative, implying that adding controls actually makes the influence of Scot or Scots-Irish settlers more salient. In other cases, explaining away the full positive relationship between the Scots and Scots-Irish or Scots-Irish only settlers and contemporary homicides would require

[36] The same result is obtained for Irish settlers only.

unobservable factors to be about 6 times greater than observable factors, making it unlikely that the estimate can be fully attributed to unobserved heterogeneity.

5.6.Instrumental variable estimation

Establishing the causal impact of Scots and Scots-Irish settlements on contemporary violence in the South requires an instrument that is correlated with settlements in the South but uncorrelated with contemporary violence. As most settlers made their way South from Northern or Pennsylvanian ports of entry on the Great Philadelphia Wagon Road, a good candidate is the distance to one of the main crossroads on this Road: Shallow Ford, a shallow point of crossing on the Yadkin River. Shallow Ford today is surrounded by forests and there is thus little reason to believe that its location should influence contemporary crime. The average distance between the geo-center of each Southern county and Shallow Ford is used as an instrument for settlements in the South. It is expected that the further away from Shallow Ford, the smallest settlements should be.

IV estimates are reported in Table 11. First stage estimates are reported in the bottom panel and second stage estimates in the top panel. The first stage estimates show that, as expected, distance to Shallow Ford is negatively correlated with Scot or Scots-Irish settlements in the South. The relevance of the instrument is satisfactory, with a F-stat higher than 12.

The second stage estimates confirm the positive and significant relationship between Scots and Scots-Irish settlers and contemporary homicide rates, overall and by white offenders. All the effects are robust to controlling for slavery in 1790.[37]

The falsification tests performed above are robust to the instrumentation strategy. When instrumented by distance to Shallow Ford, settlers of countries of origin other than Ireland or Scotland are not significantly associated with contemporary homicide. Instrumented settlements of Scot or Scots-Irish settlers have no impact on rape (results not reported here).

[37] Similar results are obtained for Irish settlers.

6. Cultural Selection and Transmission

6.1. The Evolution of the Culture of Honor

The robust relationship documented in this paper between Scot or Scots-Irish settlements in the South and interpersonal violence indicates that the culture of honor has persisted, but only in the South. Interestingly, Roth (2009) describes high homicide assailant rates by the Scots and the Scots-Irish in the 19th century not only in Virginia but in New England as well (see Section 2). However, a century later, their settlement only explains the use of lethal violence in the South. This points to more subtle cultural transmission mechanisms than the simple Cohen and Nisbett hypothesis according to which, essentially, cultural traits were brought along by settlers, transmitted intact to the next generations and dictate violent behavior regardless of the current environment. Instead, there must be something specific to the South that explains why such a violent culture shows up there only. One could think of two possible explanations. A first possibility is that violent cultural traits were, indeed, transmitted intact to next generations and persisted everywhere but only show up today in the South because of the specific contemporary institutional environment of the region. A second possibility is that violent cultural traits have only persisted in the specific institutional environment of the South but died out in the North. To put things simply, the first view supposes that the institutional environment only affects the activation of a cultural trait while the second considers that the institutional environment also affects the selection of a cultural trait.

Historical accounts are consistent with the (second) view that the early institutional environment of the US strongly influenced the selection of the culture of honor. Wyatt-Brown (2001) depicts how in the North, formal and impersonal institutions quickly substituted for the ethic of honor as the cement of social and political order in the 19th century. If it is indeed the case the institutional environment affected the selection of violent cultural traits rather than just activates such traits, one should observe that individuals born and raised in the South behave more violently than those raised elsewhere, regardless of the institutional environment in which they live. Similarly, Northerners are expected to be less violent than Southerners, even if they live in the South. The 10% sample from the 1880 Census is used to measure, at the state level, the number of native white males born and raised in different regions of the United States. Regional homicide rates are then regressed on the proportion of migrants from other regions. All regressions control for the

full set of socio-economic and demographic controls in 2000 and 1880. The purpose of the exercise is to test whether outside the South, violence is higher in counties that received large influxes of migrants born and raised in the South, and most particularly in regions with major Scot and Scots-Irish settlements such as the Carolinas and the Virginias. Results are displayed in Table 12. County level homicide rates outside the Deep South are significantly higher, the higher the proportion is of native white males who migrated from the Deep South (Columns 1 and 2) and particularly from the Carolinas and Virginias (Column 3 and 4). The results are robust to the inclusion of state fixed effects. This indicates that regardless of the institutional environment in which they live, those raised in the South are systematically associated with more violence. Conversely, in the Deep South, counties that received large influxes of migrants raised in the North or the Midwest experience less violence, although the effect is not robust to the inclusion of state dummies (Columns 5 and 6). Overwhelmingly, such evidence points to the view that the early institutional environment has affected the selection of cultural traits.

It thus seems that cultural traits pertaining to the use of interpersonal violence have only survived under the specific conditions of the South. What could such conditions be? Homicide historian Randolph Roth (2009) argues that among the main determinants of homicide are disrespect and mistrust for formal institutions and law enforcement. According to this view, the reason why the culture of honor has persisted in the South has to do with the weakness of formal and political institutions. The culture of honor characterizes a private justice system, which emerged and persisted as a substitute for public law and order. Regressions in Table 13 investigate whether the low quality of political institutions has played a role in the persistence of the culture of honor. Following Besley and Prat (2006) and Gentzkow et al. (2006), the presence of weekly or daily newspapers in 1840 is used as an indicator of institutional quality and political competition. The variable *newspapers*, which reflects the presence of weekly or daily newspapers at the state level, is negatively and significantly associated with homicide rates (Column 1): homicide is still lower where institutional quality was higher in 1840. This confirms not only that institutional quality is an important determinant of crime but also that it affects criminal behavior in the long run through the selection of cultural traits. Column 2 includes an interaction term between Scot or Scots-Irish settlers and *newspapers*. The coefficient on the interaction term is negative and significant while the main effect of Scots-Irish becomes positive and significant. Counties with larger Scots or Scots-Irish settlements at the end of the 18th century are more violent today, but

not those in which institutions were of better quality in 1840. The counterbalancing effect of better quality of institutions on the culture of violence of the Scots and Scots-Irish is present everywhere and within the South as well. Column 3 includes a triple interaction between Scot or Scots-Irish settlers, newspapers and the Deep South. The interaction term is negative and significant.

The relationship between institutional quality and homicide may explain the specificity of the Scots and Scots-Irish with regards to homicide pattern. The Scots-Irish had developed informal institutions characterized by a high reliance on honor, reputation and interpersonal violence as an adaptive response to the lawlessness and economic vulnerability that characterized the Anglo-Scot border where they originate (Leeson 2009). Scottish highlands were also areas where formal institutions were weak. In the similarly lawless environment of the frontier South, the cultural traits of the Scots and Scots-Irish may have provided the best adaptive response. The next subsection explores the cultural transmission mechanisms that explain how such culture could become the prevailing cultural norm in the South.

6.2. Cultural Transmission

If the Scots-Irish culture of honor was selected in the South as the best adaptive behavior to lawlessness and economic vulnerability, a question that immediately arises is how such a violent culture has persisted, despite changes in economic and institutional conditions and in particular the disappearance of herding as the main source of activity. The socio-psychological literature and the cultural transmission models a la Bisin and Verdier (2001) explain cultural persistence by the hysteresis of cultural norms that are transmitted from one generation to the next. The main idea of this literature is that the backward looking behavior of parents, who transmit their own values to their children, generates hysteresis that can explain the slow adaptation of cultural values to new economic environments.[38] In accordance with this thesis, Cohen and Nisbett (1996) document differences in children socialization by Southerners vs. Northerners. For example, Southerners are more likely to defend corporal punishments and to "advocate spanking to discipline their children" (Cohen and Nisbett 1996, page 67). In parallel, studies have shown that socialization for aggression in boys in childhood is a strong predictor of higher rates of homicide and assault (Ember and Ember 1994).

[38] See Fernandez and Fogli 2007 in the context of work and fertility decisions, Tabellini (2008a and 2008b) for social trust, Hauk and Saez Marti (2001) for corruption.

Vertical cultural transmission from parents to children implies that agents internalize cultural norms within families so that even today, Americans of Scots-Irish ancestry should display cultural traits that are consistent with a culture of honor. To test the relevance of such a transmission mechanism, contemporary homicide rates are regressed on the proportion of Americans who report Scots-Irish as first or second ancestry in the 2000 census.[39] Results are reported in Table 14. As can be seen in Column 1, it is not the case that Americans of Scots-Irish ancestry are associated with more violence regardless of their geographic distribution. However, in the South and in the Mountain West, they are (Column 2). A reason why the result is also observed in the Mountain West may have to do with the large influx of Southern migrants, who brought their culture of violence with them (see Section 6.1) and to the fact that institutional quality was also low in that region. Such a culture may have been as much of an appropriate behavior in the lawless environment of the West as it had been in the South.

If a culture of violence was selected in the South as a system of private justice in response to lawlessness and large-scale theft, it was precisely the Scots-Irish culture that may have proved to be the most adequate. It is not suggested here that the culture of honor was designed specifically as a response to the circumstances of the herding economy of the Southern United States. Instead, such cultural traits were preexisting among a certain category of settlers. Because such traits were the best adaptive response to economic vulnerability and lawlessness, they were selected and transmitted to other and subsequent settlers and became the prevailing cultural norm. Leeson (2009) describes how the Scots-Irish cultural norms emerged as a decentralized response to the lawlessness, intergroup banditry and large-scale cattle theft that characterized, for several centuries, the Anglo-Scot borders where the Scots-Irish originated.[40] The Scots and Scots-Irish were historically defiant of centralized institutions (Leeson 2009, Webb 2004). Such attitudes may have been caused or at least reinforced by pastoralism. Burnham (1979) namely describes how capital mobility in pastoral societies inhibits the development of both political

[39] One could raise doubts about the reliability of self-reported ancestry information in census data. The results are nonetheless robust to the instrumentation of Americans of self-declared Scot or Scots-Irish ancestry by white, native Presbyterians from the 1900 Census. Results are not reported here, but the instrument has a strong predictive power (F stat of 863) and the coefficient on the instrumented variable is significant and positive at the 5% level in explaining murder rates by white offenders in the Deep South.

[40] The author specifically refers to the 250-year period between the first War of Scottish Independence in 1296 and the Treaty of Norham in 1551, England and Scotland were in open conflict with one another and the borderland was in anarchy. Even after the 1551 Treaty, even though there was no official war, the tradition of enmity between various clans continued, "with each group's members viewing the other's as targets whom they might murder, kidnap, and despoil without compunction" (Leeson 2009, page 475).

centralization and class stratification. Tendencies to self-rule and to develop an informal order as a substitute for formal law enforcement may have been exacerbated in the weak institutional environment of the South. Regressions displayed in Table 15 explore whether the Southerners of Scots-Irish ancestry, beyond being more violent, also display a value system that is coherent with the reliance on private justice. I use attitudinal data from the *General Social Survey* and explore whether American of self-reported Scots-Irish ancestry differ significantly in their attitude towards self-reliance and centralized institutions. The results confirm this. Southerners of Scottish and Scots-Irish ancestry have a higher tendency to own guns and to be less trusting of the federal government and of formal law enforcement (courts). It is also worth noting here that there is no evidence in the data that out-migration for people of Scots-Irish ancestry was any different from out-migration for people of other European ancestry, such as English or German.[41]

In addition to vertical transmission mechanisms, the literature on cultural transmission discusses the influence of 'oblique and horizontal socialization' mechanisms through peer effects and learning (see Bisin and Verdier 2008 for a review). To test for the presence of horizontal transmission mechanisms, I investigate whether settlers of countries of origin other than Ireland and Scotland are associated with more violence in counties where the proportion of Scot or Scots-Irish is higher. The tested hypothesis is: if settlers imitated the Scots-Irish cultural norm, those living in counties with higher proportion of Scots-Irish should be associated with more violence. Failure to reject the nil hypothesis that such an interaction is not different from zero is interpreted as a sign of horizontal cultural transmission. The coefficient of interest is that of the interaction between Deep South, the proportion of Scots and Irish and the number of settlers from Holland, France or Germany. Results are reported in Table 16. The nil is rejected: Dutch, French or German settlers in counties with high proportions of Scots or Scots-Irish are associated with more violence than those in counties with lower proportions. This provides evidence for horizontal transmission of cultural norms from the Scots and Scots-Irish to other settlers and illustrates how, through imitation by other settlers, the culture of violence could have become the prevailing cultural norm in the South. Additional specifications whose results are not reported here perform a falsification test akin to the one presented in Section 5.2. and show that there is

[41] Historical settlements in 1790 or 1900 do not have a higher predicting power on contemporary populations of self-declared Scots-Irish ancestry compared with other European ancestries, such as English or German.

no evidence of cultural transmission from the Scots-Irish to other settlers for a violent crime unrelated to a culture of honor, rape.

I then investigate similar issues regarding transmission to African Americans. Wyatt-Brown (2001) argues that culture of honor prospered in the South because of the lack of formal and institutionalized social order, and even, prior to the 19th century, of a strict religious order. He then argues that, a fortiori, the culture of honor prevailed in slave barracks. The author describes the "pecking order of the plantation - mirror image of the quarters of the patriarchal, male dominated, honor-obsessed rankings of the white society" (Wyatt-Brown 2001, page 23). If the culture of honor was transmitted to African Americans, one should expect higher homicide rates –especially by black offenders- in counties where black populations cohabited with high proportions of Scots or Scots-Irish settlers. Table 17 presents results where homicide rates today, overall and by black offenders, are regressed on an interaction between blacks and the proportion of Scots or Scots-Irish settlers in the Deep South. The effect of the interaction is never significant, whether black population in 1790 or today is considered. The results thus indicate that the culture of honor was transmitted to other white European settlers of non-Scot or Scots-Irish ancestry but not to African Americans.

7. Conclusion

This paper examines the economic and cultural underpinnings of lethal interpersonal violence. Some authors have hypothesized that the Southern taste for violence is inherited from the Scot and Scots-Irish herders that settled the region. The results illustrate something consistent with this but slightly different. Scot or Scots-Irish presence explains high homicide rates, by all offenders as well as by white offenders, but only within the South. Moreover, differences in pastoralism matter, which confirms the herding origins of the culture of honor, but again, only within the South and when they are present simultaneously with the Scots or Scots-Irish. To resume, it is in the interaction between the cultural background of a specific group of settlers, their economic activity and the institutional environment of the South that the culture of honor finds its root and explains high homicide in the South. The Scots-Irish culture of inter-personal violence, shaped by a history of lawlessness in the Anglo-Scot borderlands and in Ulster (Leeson 2009), has thrived in areas where the institutional environment was weak, which was the case in

the South. The culture of honor emerged as a private justice system, which substituted for formal law enforcement. Associated with such a culture of private violence is a value system stressing the importance of self-reliance and characterized by defiance of formal and centralized institution, which are still carried by Southerners of Scots-Irish decent. Investigating in more details how pastoralism may have shaped socio-economic values is the object of future research.

The relationship between Scots and Scots-Irish settlers and homicides is very likely causal. The results are robust to the inclusion of a wide array of contemporary socio economic and demographic determinants of crime and alternative historical determinants of violence, such as slavery. The positive relationship between settlers and homicides does not hold with other countries of origin or when other types of violent crime are considered. The results are robust to instrumenting Southern settlements by the distance to a major crossroads on the settlers' route to the South. Moreover, consistently with an ethic based on kinship and the defense of a reputation, Scot or Scots-Irish settlements in the South do not explain violence in general but only homicides in which the offender and the victim are acquaintances.

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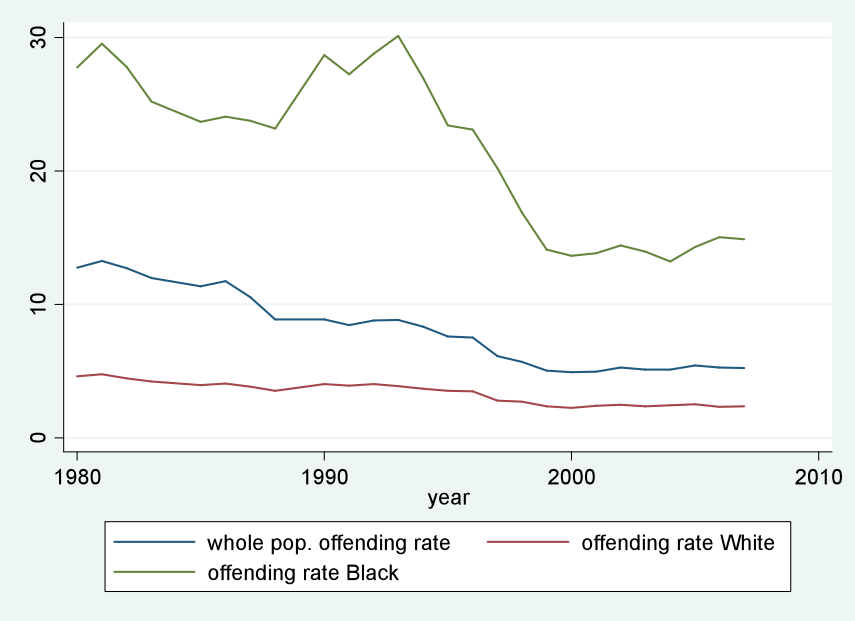
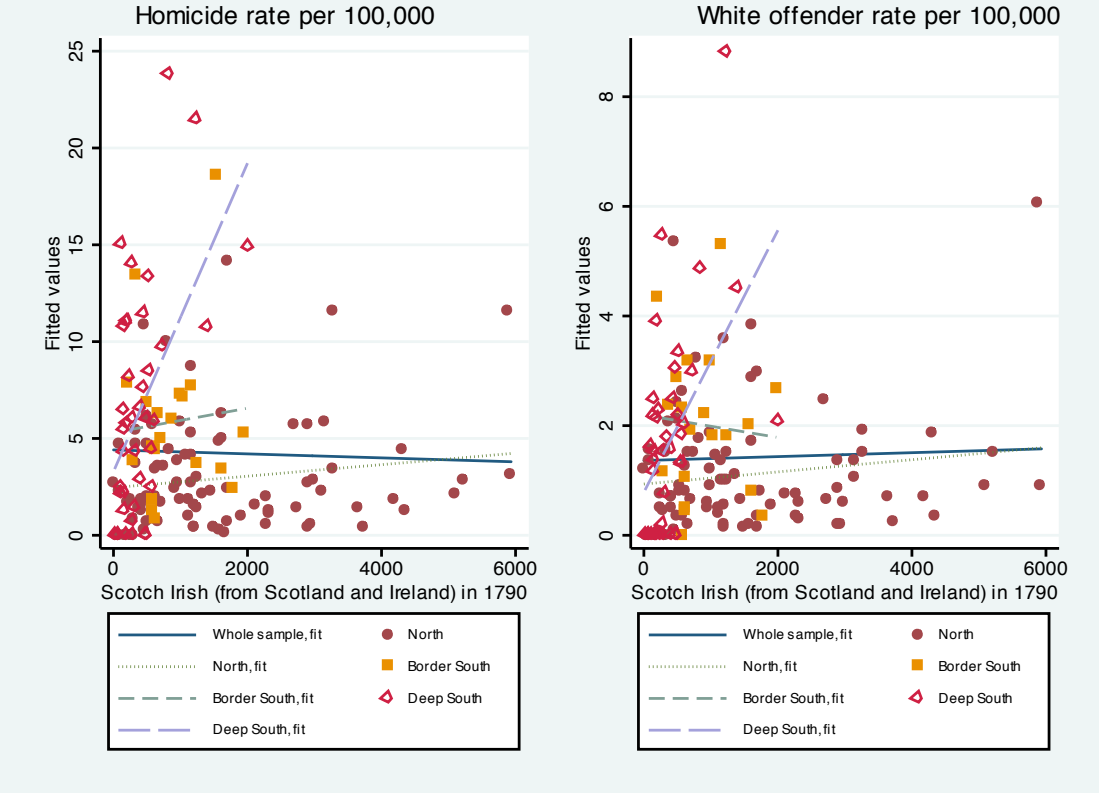
9. Figures and Tables

Figure 1: Homicide Offending Rates, by Race: 1980-2007



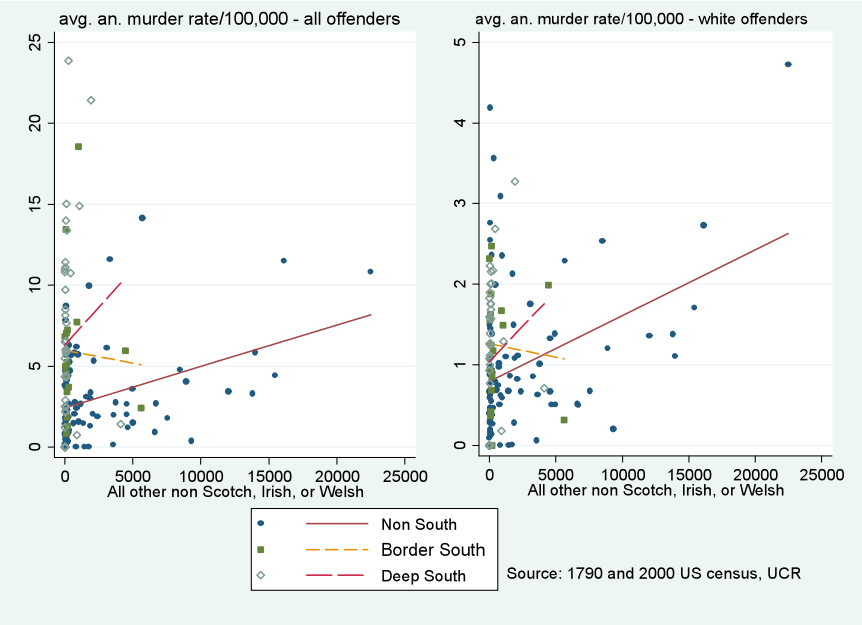
Source: UCR

Figure 2: Murder rates, by Region and Scots-Irish Settlers in 1790



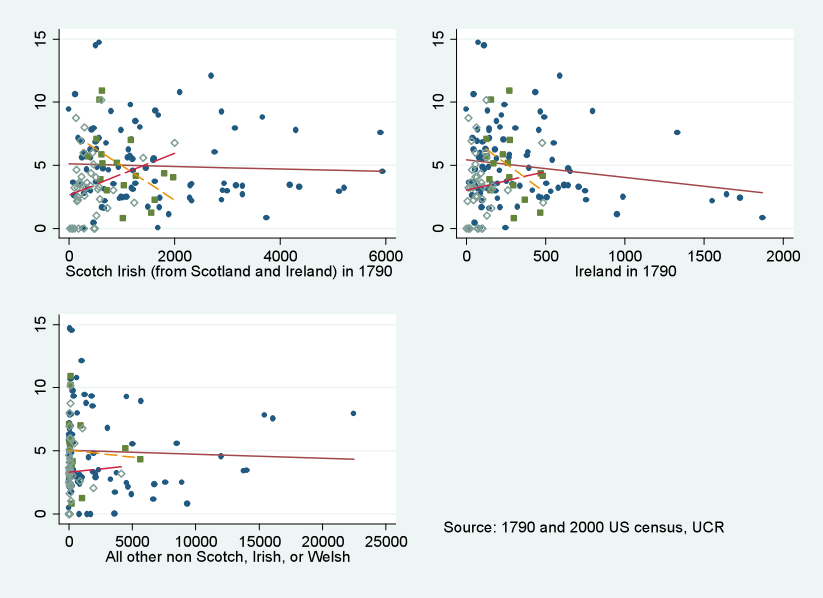
Source: UCR, US Census

Figure 3: Other offenses: rape – white offenders - Scots-Irish, Irish only and all non Scots-Irish or Welsh settlers



Source: UCR, US Census

Figure 4: Murder rates (a) and by white offenders only (b) by Region. Non Scots-Irish settlers in 1790



Source: US Census, UCR

Table 1: Homicides and Scots-Irish Settlers in 1790 – All and white offenders only

	1	2	3	4	5
PANEL (a)	Annual homicide rate per 100,000 - 2000-2007 average				
Scots Irish	-0.020		0.035*	0.030**	0.022
	[0.019]		[0.017]	[0.013]	[0.013]
Border South		2.947***	3.421***	2.826***	0.176
		[0.501]	[0.510]	[0.532]	[1.752]
Deep South		3.643*	4.566**	0.999*	-2.925**
		[1.766]	[1.775]	[0.493]	[1.335]
Border South*Scots Irish				0.034	0.109
				[0.025]	[0.135]
Deep South*Scots Irish				0.746***	0.652***
				[0.102]	[0.097]
Log aggregate earning, 2000					-0.160
					[0.432]
Prop. Pop. Urban, 2000					-2.505
					[2.397]
Prop. Pop. Poverty, 2000					4.204
					[13.820]
Prop. Pop. Black, 2000					12.756***
					[3.954]
Fractionalization					2.330
					[3.458]
Gini					3.301
					[13.037]
County pop. 1790	yes	no	yes	yes	yes
Observations	149	150	149	149	149
R-squared	0.002	0.150	0.189	0.291	0.495

	1	2	3	4	5
PANEL (b)	White offender rate per 100,000 – 2000-2007 average				
Scots Irish	0.002		0.014*	0.013*	0.004
	[0.005]		[0.008]	[0.007]	[0.006]
Border South		0.899***	1.035***	1.227**	0.426
		[0.275]	[0.274]	[0.503]	[0.640]
Deep South		0.661	0.930	-0.156	-0.859**
		[0.551]	[0.531]	[0.175]	[0.378]
Border South*Scots Irish				-0.030	-0.012
				[0.035]	[0.045]
Deep South*Scots Irish				0.230***	0.164***
				[0.025]	[0.040]
Log aggregate earning, 2000					0.181
					[0.134]
Prop. Pop. Urban, 2000					-0.911*
					[0.454]
Prop. Pop. Poverty, 2000					9.889
					[5.697]
Prop. Pop. Black, 2000					4.591***
					[1.407]
Fractionalization					-1.223
					[1.219]
Gini					-6.954*
					[3.270]
County pop. 1790	yes	no	yes	yes	yes
Observations	149	150	149	149	149
R-squared	0.001	0.069	0.096	0.191	0.411

Notes to Table 1: All regressions with a constant. Robust standard errors clustered at the state level. ***: significant at 1%, **: significant at 5%, * significant at 10% level.

Scots-Irish settlers or Irish settlers scaled by 100.

Source: 1790 and 2000 census, UCR.

Table 2: Type of Homicide: Homicide rate between non-family related acquaintances

	1	2	3	4	5	6
	Homicide rate - non family related acquaintances			Homicide rate - love related		
Scots Irish	0.024**	0.023**	0.016*	0.003	0.003*	0.002
	[0.009]	[0.008]	[0.007]	[0.002]	[0.001]	[0.001]
Border South	1.007***	1.213***	-0.433	0.064*	0.156***	-0.122
	[0.157]	[0.226]	[0.463]	[0.032]	[0.039]	[0.117]
Deep South	2.476**	0.835**	-0.436	0.460***	0.474***	0.077
	[1.113]	[0.323]	[0.305]	[0.102]	[0.088]	[0.188]
Border South*Scots Irish		-0.039**	0.042		-0.010***	-0.012
		[0.014]	[0.035]		[0.002]	[0.008]
Deep South*Scots Irish		0.325***	0.224***		-0.002	-0.002
		[0.083]	[0.062]		[0.036]	[0.022]
Socio-demo controls, 2000	no	no	yes	no	no	yes
County pop 1790	yes	yes	yes	yes	yes	yes
Observations	138	138	138	138	138	138
R-squared	0.222	0.316	0.521	0.112	0.113	0.251

Notes to Table 2: All regressions with a constant. Robust standard errors clustered at the state level. ***: significant at 1%, **: significant at 5%, * significant at 10% level.

Scots-Irish settlers or Irish settlers scaled by 100.

Socio-economic and demographic controls: log of aggregate earnings, proportion of the population in urban areas, proportion of the population below or at poverty level, proportion of the population black, fractionalization index, Gini index).

Source: 1790 and 2000 census, UCR.

Table 3: The Herding Base of the Scots-Irish Culture of Honor

	1	2	3	4	5	6	7	8
	Homicide rate		White offender		Homicide rate		White offender	
Deep South	-0.309	4.459	-0.272	2.385	-0.180	0.994	-0.160	0.732
	[0.997]	[2.712]	[1.017]	[4.268]	[0.319]	[0.886]	[0.322]	[1.271]
ScotsIrish			0.010	0.033			0.008	0.015
			[0.032]	[0.030]			[0.015]	[0.016]
sheep&pigs per cap	-0.162	-0.059	-0.141	0.039	-0.033	-0.008	-0.001	0.054
	[0.146]	[0.134]	[0.180]	[0.167]	[0.052]	[0.052]	[0.071]	[0.079]
sheep&pigs*Scots Irish			-0.002	-0.008			-0.003	-0.005
			[0.007]	[0.007]			[0.003]	[0.004]
sheep&pigs*Deep South		-2.393**		-3.402**		-0.589*		-1.100**
		[1.106]		[1.529]		[0.347]		[0.432]
ScotsIrish*Deep South				-0.141				-0.102
				[0.319]				[0.082]
sheep&pig*ScotsIrish*DeepSouth				0.592***				0.223***
				[0.186]				[0.054]
Socio-demo controls, 2000	yes	yes	yes	yes	yes	yes	yes	yes
County pop. 1790	yes	yes	yes	yes	yes	yes	yes	yes
Observations	148	148	148	148	148	148	148	148
R-squared	0.429	0.467	0.429	0.548	0.331	0.354	0.334	0.453

Notes to Table 3: All regressions with a constant. Robust standard errors clustered at state level ***: significant at 1%, **: significant at 5%, * significant at 10% level.

Scots-Irish settlers or Irish settlers scaled by 100. Sheep and pigs per 1840 capita.

All regressions control for socio-economic and demographic controls: log of aggregate earnings, proportion of population in urban areas, proportion of population below or at poverty level, proportion of the population black, fractionalization index, Gini index).

Source: 1790, 1840 and 2000 census, UCR.

Table 4: Robustness to Slavery

	1	2	3	4
	avg. annual murder rate 00-07		white offender rate	
Scots-Irish	0.024	0.019*	0.003	0.002
	[0.021]	[0.010]	[0.007]	[0.004]
Deep South*Scots-Irish		0.857***		0.313***
		[0.130]		[0.074]
Slave population 1790	0.014*	-0.013	0.000	-0.010*
	[0.007]	[0.010]	[0.003]	[0.005]
County pop 1790	yes	yes	yes	yes
Socio-demo and eco controls 2000	yes	yes	yes	yes
Observations	149	149	149	149
R-squared	0.442	0.501	0.371	0.444

Notes to Table 4: All regressions with a constant. Robust standard errors clustered at state level ***: significant at 1%, **: significant at 5%, * significant at 10% level.

Scots-Irish settlers or Irish settlers are scaled by 100.

All main effects and regional dummies included.

Socio-economic and demographic controls: log of aggregate earnings, proportion of the population in urban areas, proportion of the population below or at poverty level, proportion of the population black, fractionalization index, Gini index)

Source: 1790, 1840 and 2000 census, UCR.

Table 5: Falsification I.1.: Homicides by White Offenders and Other Settlers in 1790

	1	2	3	4	5
	White offender homicide rate				Homicide rate-non family related acquaintances
	Holland	France	Germany	England and Wales	All non Scots-Irish settlers
Settlers	0.002	0.086	0.012***	-3.545	0.005*
	[0.005]	[0.059]	[0.001]	[5.502]	[0.002]
Border South*Settlers	-0.226	-0.528**	-0.016**	-3.700	0.000
	[0.718]	[0.236]	[0.005]	[6.753]	[0.007]
Deep South* Settlers	**1.086**	**0.064**	**0.022**	**16.296**	**0.008**
	[2.091]	[0.172]	[0.048]	[14.040]	[0.020]
County pop 1790	yes	yes	yes	yes	yes
Socio-demo and eco controls 1790	yes	yes	yes	yes	yes
Observations	149	149	149	149	138
R-squared	0.374	0.388	0.439	0.411	0.484

Table 6: Falsification I.2.: Is there a herding link with the non Scots-Irish?

	1	2	3	4
	avg. annual murder rate 00-07		White offender	
Deep South	4.074	3.5	1.171	0.927
	[3.275]	[4.103]	[1.045]	[1.242]
Sheep and pigs per capita	-0.066	-0.028	0.06	0.032
	[0.134]	[0.140]	[0.052]	[0.058]
sheep&pig*Deep South	-0.534	-2.059	-0.319	-0.596
	[1.463]	[1.728]	[0.486]	[0.515]
All non Scots-Irish	0.036***	0.025**	0.020***	0.015***
	[0.011]	[0.011]	[0.006]	[0.005]
sheep&pig*Non ScotsIrish	-0.01	-0.003	-0.006*	-0.003
	[0.006]	[0.004]	[0.003]	[0.002]
Non ScotsIrish*Deep South	1.393**	0.5	0.352	0.129
	[0.637]	[0.591]	[0.340]	[0.263]
sheep&pig* Non ScotsIrish*Deep South	**-0.562****	**-0.174**	**-0.13**	**-0.038**
	[0.252]	[0.246]	[0.132]	[0.105]
County pop 1790	yes	yes	yes	yes
Socio-demo and eco controls 2000	no	yes	no	yes
Observations	148	148	148	148
R-squared	0.247	0.5	0.214	0.436

Notes to Tables 5 and 6: All regressions with a constant. Robust standard errors clustered at the state level. ***: significant at 1%, **: significant at 5%, * significant at 10% level.

All settlers scaled by 100. "Non Scots-Irish" is the sum of Dutch, French and German settlers.

Source: 1790 and 2000 census, UCR.

Table 7: Falsification II.2.: Are the Scots-Irish associated with non-culture of honor related violence?

	1	2
	rape, white offender	
Scots-Irish	-0.002	-0.002
	[0.018]	[0.019]
Border South* Scots-Irish		0.029
		[0.150]
Deep South* Scots-Irish		0.025
		[0.165]
Slave pop 1790	yes	yes
County pop 1790	yes	yes
Socio-demo and eco controls 2000	yes	yes
Observations	149	149
R-squared	0.293	0.293

Table 8: Falsification II.2.: Does the herding link explain other violent crime?

	1
	rape, white offender
Scots-Irish	0.024
	[0.025]
sheep&pig* Scots-Irish	-0.009
	[0.006]
Scots-Irish *Deep South	0.088
	[0.133]
sheep&pig* Scots-Irish *Deep South	-0.013
	[0.093]
County pop 1790	yes
Socio-demo and eco controls 2000	yes
Observations	148
R-squared	0.293

Notes to Tables 7 and 8: see notes to Table 2 and 3. All regional main effects and interactions controlled for.

Table 9: Robustness to Lawlessness

	1	2	3	4	5	6	7	8
	avg. annual murder rate 00-07				white offender			
Scots-Irish	0.014	0.011	0.008	0.002	0.004	0.004	0.001	0.001
	[0.015]	[0.017]	[0.011]	[0.014]	[0.006]	[0.007]	[0.006]	[0.007]
Deep South *ScotsIrish	0.447***	0.695***	0.364**	0.415***	0.151***	0.163***	0.129***	0.132***
	[0.070]	[0.087]	[0.131]	[0.112]	[0.032]	[0.042]	[0.035]	[0.035]
weaponcarry rate, all	0.045***			0.033**				
	[0.009]			[0.011]				
drunkenness rate, all		0.006*		0.005*				
		[0.003]		[0.002]				
property crime, all			0.019*	0.008				
			[0.009]	[0.009]				
weaponcarry rate, white					0.021***			0.009
					[0.005]			[0.007]
drunkenness rate, white						0.000		0
						[0.002]		[0.001]
property crime, white							0.011**	0.009
							[0.005]	[0.006]
County pop 1790	yes	yes	yes	yes	yes	yes	yes	yes
Socio-demo and eco controls, 2000	yes	yes	yes	yes	yes	yes	yes	yes
Observations	149	149	149	149	149	149	149	149
R-squared	0.603	0.521	0.566	0.625	0.454	0.411	0.47	0.475

Notes to Table 9: see Notes to Table 2. All offenses rates are average yearly rates per 100,000 and averaged over 2000-2007. White rates are computed as the share of offenses committed by whites over the white population.

Table 10: Assessing the Bias due to Selection on Unobservables

		Homicide rate by all offenders Deep South*Scots-Irish	White offender only Deep South*Scots-Irish
Controls, full set:	Controls, restricted set:		
Full set from equation (1)	none	5.70	-1.07
Full set from equation (1) and initial slave population	none	-9.51	-1.04
Full set from equation (1)	Total pop. in 1790	6.97	-1.09
Full set from equation (1) and initial slave population	Total pop. in 1790	-7.73	-1.04

Notes to Table 10: Each cell reports ratios based on the coefficients for the interaction between Deep South and Scots and Irish settlers from two regressions, one with a restricted set of controls $\left(\hat{\beta}^R\right)$, the other with the full set of controls $\left(\hat{\beta}^F\right)$. The ratio is calculated as: $\hat{\beta}^F / \left(\hat{\beta}^R - \hat{\beta}^F\right)$. In all regressions, the samples are identical.

Table 11: Instrumental Variable Estimation

	Second stage	
	1	2
	homicide rate	white offender
Scots&Irish	2.89***	0.84***
	[1.04]	[0.22]
Irish		
Socio-eco and demo controls	yes	yes
County pop, 1790	yes	yes
Observations	39	39
R-squared	0.411	0.496
	First stage	
	Scots-Irish	
ln(distance Shallow Ford)	-406.28***	
	[114.00]	
Socio-eco and demo controls	yes	
County pop, 1790	yes	
Observations	39	
R-squared	0.896	
F-stat of excluded instruments	12.70	

Notes to Table 11: see notes to Table 2. Distance to Shallow Ford is computed using the great circle formula, between geocenters of counties and Shallow Ford. Deep South sample only.

Table 12: Current Institutions vs. Culture

Dependent variable:	1	2	3	4	5	6
	White offender homicide rate:					
	Outside the Deep South		Outside the Deep South		In the Deep South	
Native white males born in Deep South	371.981**	370.514***				
	[168.106]	[126.880]				
Native white males born in the Carolinas and Virginias			347.530**	390.613***		
			[161.975]	[94.267]		
Native white males born outside the South					-596.911*	-146.841
					[292.573]	[162.413]
Socio-eco and demo controls 2000	yes	yes	yes	yes	yes	yes
Socio-eco and demo controls 1880	yes	yes	yes	yes	yes	yes
State dummies	no	yes	no	yes	no	yes
Observations	1,484	1,484	1,484	1,484	793	793
R-squared	0.190	0.317	0.188	0.317	0.033	0.086

Notes to Table 12: All regressions with a constant. Robust standard errors clustered at the state level. ***: significant at 1%, **: significant at 5%, * significant at 10% level. All regressions control for all 2000 controls (see Notes to Table 2), the population in 1880, black population, manufacturing wages and rural vs. urban in 1900.

Source: 10% individual sample from the 1880 Census. UCR

Table 13: Institutional quality: newspapers

	1	2	3	4
	Homicide rate			
Deep South	-4.28	-2.37	-7.77***	-77.68***
	[2.484]	[2.640]	[2.524]	[13.215]
ScotsIrish, 1790	0.01	0.52**	0.08	0.13
	[0.024]	[0.197]	[0.125]	[0.132]
newspapers	-6.56**	-1.47	-7.18**	-6.49
	[2.766]	[3.023]	[2.844]	[5.376]
ScotsIrish*newspapers		-0.79**	-0.14	-0.20
		[0.298]	[0.196]	[0.192]
Deep South*ScotsIrish			0.81***	4.67***
			[0.168]	[1.041]
Deep South*newspapers				453.65***
				[80.180]
Deep South*ScotsIrish*newspapers				-26.02***
				[6.331]
County pop 1790	yes	yes	yes	yes
Socio-eco and demo controls 2000	yes	yes	yes	yes
Observations	149	149	149	149
R-squared	0.460	0.501	0.529	0.556

Notes to Table 13: All regressions with a constant. Robust standard errors clustered at the state level. ***: significant at 1%, **: significant at 5%, * significant at 10% level. All regressions control for all 2000 controls, and the county population in 1790. *newspapers* is the average, at the state level, of a dummy variable that indicates the presence of weekly or daily newspapers at the county level. All regressions control for all regional dummies (results for the Border South dummy not displayed, North is the excluded category). In the regression in Column 3, all interactions with Border South are included but the results not displayed here.

Source: 1790 Census, 1840 Census, UCR.

Table 14: Vertical Transmission

	1	2
	Homicide rate, white offender	
Border South	0.26	-0.13
	[0.62]	[0.69]
Deep South	1.56***	1.33***
	[0.35]	[0.36]
West	2.37**	2.17**
	[0.91]	[1.05]
Mountain West	0.71	0.31
	[0.48]	[0.51]
Midwest	0.05	-0.23
	[0.35]	[0.36]
ScotsIrish_2000	-0.80	-5.75**
	[2.64]	[2.30]
Border South*ScotsIrish		10.96**
		[2.30]
Deep South*ScotsIrish		3.86**
		[1.88]
West*ScotsIrish		3.97
		[3.26]
Mountain West* ScotsIrish		11.29***
		[3.38]
Midwest*ScotsIrish		5.44
		[3.26]
Total Pop, 2000	yes	yes
Socio-demo and eco controls, 2000	yes	yes
Observations	2,845	2,845
R-squared	0.063	0.064

Notes to Table 14: All regressions with a constant. Robust standard errors clustered at the state level. ***: significant at 1%, **: significant at 5%, * significant at 10% level.

Socio-economic and demographic controls: log of aggregate earnings, proportion of the population in urban areas, proportion of the population below or at poverty level, proportion of the population black, fractionalization index, Gini index).

"ScotsIrish_2000" refers to people reporting Scots-Irish as first or second ancestry in the 2000 census, expressed per 100,000.

Mountain West: Idaho, Montana, Wyoming, Arizona, New Mexico, Colorado, Nevada, Utah. West: California, Oregon, Washington. Midwest: Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Ohio, Wisconsin.

Source: 2000 Census, UCR.

Table 15: Attitudes of the Scots-Irish towards self-reliance and centralized institutions

	1	2	3	4	5	6
	Weapon at home		Confidence Sup. Court		Confidence Fed. gov.	
Border South	0.145***	0.138***	-0.085*	-0.034	0.010	0.018
	[0.034]	[0.036]	[0.046]	[0.047]	[0.011]	[0.014]
Deep South	0.090***	0.086***	-0.128**	-0.105*	0.026***	0.031***
	[0.018]	[0.018]	[0.048]	[0.049]	[0.005]	[0.003]
West	0.061**	0.060**	-0.019	0.006	-0.041***	-0.044***
	[0.026]	[0.024]	[0.048]	[0.044]	[0.004]	[0.005]
Midwest	0.074***	0.074***	-0.050	-0.022	-0.029***	-0.027***
	[0.020]	[0.020]	[0.052]	[0.061]	[0.006]	[0.003]
Scotland&Ireland	**-0.002**	-0.021***	**0.008**	0.166***	**-0.027**	-0.007
	[0.010]	[0.003]	[0.040]	[0.013]	[0.016]	[0.016]
Border South*S&I		0.051		-0.318***		-0.064
		[0.028]		[0.025]		[0.040]
Deep South*S&I		**0.033*****		**-0.145****		**-0.047****
		[0.005]		[0.057]		[0.015]
West*S&I		0.014		-0.168		0.034
		[0.029]		[0.114]		[0.035]
Midwest*S&I		0.001		-0.180*		0.021
		[0.011]		[0.088]		[0.041]
Socio-demo and eco	yes	yes	yes	yes	yes	yes
year dummies	yes	yes	yes	yes	yes	yes
Observations	39,559	39,559	3,526	3,526	26,338	26,338
R-squared	0.067	0.067	0.013	0.015	0.005	0.005

Notes to Table 15**:** All regressions with a constant and year dummies. Robust standard errors clustered at the regional level. ***: significant at 1%, **: significant at 5%, * significant at 10% level. Data from the General Social Survey 1972-2008 Cumulative Data set. Weapon at home is a dummy variable that takes value 1 if the respondent owns a pistol, rifle or shotgun. The GSS asks the following question: "I am going to name some institutions in this country. As far as the people running these institutions are concerned, would you say you have a great deal confidence, only some confidence, or hardly any confidence at all in them? "Confidence Sup Court" is the answer to this question applied to the U.S. Supreme Court. The variable takes values from 1: "no confidence at all" to 5: "complete confidence". Confidence Fed. Gov is the answer to the same question applied to the "Executive branch of the federal government". All regressions control for the respondent's income, working status, marital status, sex, race, whether the respondent is born in the US and the size of the place of residence of the respondent. Source: US General Social Survey.

Table 16: Horizontal Transmission: Transmission to other settlers

	1 homicide, white	2 rape, white	3 property, white
Prop Scots-Irish	1.53	-2.087	54.795
	[1.017]	[3.421]	[46.356]
other settlers	0.015***	0	0.002**
	[0.003]	[0.000]	[0.001]
prop Scots-Irish *other settlers	-0.065***	0.008	-0.835
	[0.020]	[0.090]	[1.420]
Deep South*other settlers	-0.242***	0.001	-0.001
	[0.021]	[0.001]	[0.016]
Deep South*prop Scots-Irish	13.311	2.409	288.38
	[8.358]	[17.331]	[309.317]
Deep South*prop Scots-Irish *other settlers	7.451***	-3.867**	10.239
	[0.656]	[1.288]	[36.407]
Observations	yes	149	149
R-squared	yes	0.277	0.4

Table 17: Horizontal Transmission to African Americans

	1	2	3	4
	Homicide rate		black offender	
Black, 1790		-0.085		-0.061
		[0.067]		[0.037]
Deep South*Black1790		0.140*		0.103**
		[0.073]		[0.038]
prop Scots-Irish	4.045	5.079	3.371*	1.756
	[4.100]	[3.620]	[1.844]	[2.142]
prop Scots-Irish *Black1790	0.450**	0.142	0.203*	0.399
	[0.184]	[0.343]	[0.105]	[0.457]
Deep South* Scots-Irish		206.328		100.686
		[132.243]		[59.004]
Deep South* Scots-Irish *Black1790		-1.434		-1.586**
		[1.038]		[0.644]
County pop 1790	yes	yes	yes	yes
Socio-demo and eco controls, 2000	yes	yes	yes	yes
Observations	149	149	149	149
R-squared	0.453	0.516	0.447	0.486

Notes to Table 16 and 17: All regressions with a constant. Robust standard errors clustered at the state level. ***: significant at 1%, **: significant at 5%, * significant at 10% level.

All main effects and two-way interactions controlled for.

Socio-economic and demographic controls: log of aggregate earnings, proportion of the population in urban areas, Proportion of the population below or at poverty level, proportion of the population black, fractionalization index, Gini index). Other settlers are settlers from Holland, France and Germany, scaled by 100.

Source: 1790 census, UCR.

Appendix

APPENDIX A: Descriptive Statistics and Additional Tables

Table A1: Immigrants and total population in each State recorded in 1790 census

	Ireland	Scotland	Scots-Irish	England & Wales	Holland	France	Germany	Total
Connecticut	1589	6425	8014	223437	258	512	4	237655
Maine	1160	3674	4834	78076	274	72	379	84341
Maryland	4550	12441	16991	161011	254	1336	11246	290657
Massachusetts	3967	13855	17822	363137	433	743	110	390858
New Hampshire	1346	6648	7994	132726	153	142	0	141899
New Jersey	12099	13156	25255	98620	21581	3565	15678	184139
New York	2525	10034	12559	245901	50600	2424	1103	340241
Pennsylvania	8614	49567	58181	249656	2623	2341	110357	433611
Rhode Island	459	1976	2435	62079	19	88	33	69112
South Carolina	1468	4462	5930	38747	105	1498	2072	137079
Vermont	597	2562	3159	81149	428	153	35	85341
Virginia	2313	8242	10555	99929	166	724	5514	340898
West Virginia	278	872	1150	8930	81	49	763	14194

Notes to Table A1: The discrepancy between the total column and the sum of remaining columns is accounted for by "other nationalities" and "Hebrew" recorded in the census. Source: 1790 US census.

Table A2: Contemporary homicides statistics in states and counties included in 1790 census

State	Number of counties in 1790 census	Pop. 2000	White pop. 2000	Homicide rate	white offender rate
Connecticut	8	3405565	2777794	2.79	1.08
Maine	3	485970	470152	0.88	0.45
Maryland	17	4609017	2825807	5.86	1.85
Massachusetts	13	5440932	4615042	1.62	0.55
New Hampshire	5	926001	884558	0.66	0.31
New Jersey	13	5068187	3770038	3.67	1.13
New York	15	10466249	6293763	2.80	1.08
Pennsylvania	21	8496607	6903445	4.60	1.78
Rhode Island	5	1048319	890766	1.40	0.66
South Carolina	5	607103	358554	15.71	4.55
Vermont	7	412799	399148	2.98	1.38
Virginia	35	2840995	2031118	5.26	1.37
West Virginia	3	170721	161749	5.94	2.88

Source: 1790 and 2000 US census and UCR

Table A3: Descriptive Statistics of Variables used in Regression Analysis (1790 sample)

Panel (a): Whole sample

Variable		Obs.	Mean	Std. Dev.	Min	Max
av. an. homicide rate per 100,000	average annual murder rate per 100,000 2000-2007 (UCR)	150	4.29	4.36	0	23.86
white offenders rate	white offender arrested for murder, per 100,000 2000-2007 yearly average (UCR)	150	1.40	1.40	0	8.83
Scots-Irish	Scottish or Irish settlers in 1790 (1790 census)	150	1165.86	1221.74	0	5934
Ireland	Irish settlers in 1790 (1790 Census)	150	273.10	328.82	0	1866
All non Scots-Irish	Settlers from country other than Scotland, Ireland or Wales in 1790 (1790 census)	150	1647.40	3516.63	0	22483
log aggregate earnings	2000 census	150	21.46	1.59	18.26	24.71
Prop. pop. in urban areas	2000 census	150	0.61	0.31	0	1.00
Prop. pop. Below poverty line	2000 census	150	0.09	0.04	0.02	0.25
Prop. pop. black	2000 census	150	0.03	0.04	0	0.16
fractionalization index	2000 census - Zanella et al. (2010)	150	0.30	0.18	0.03	0.78
Gini	Gini index (2000 census, Mark Burkey)	150	0.43	0.04	0.34	0.59
Slaves in 1790	Number of slaves in 1790 per 100,000 (1790 Census)	75	2006.79	4470.98	8	34474.75
sheep&pigs	Pigs and sheep per capita (1840 Census)	148	2.24	1.69	0.01	11.67

Panel (b): By Region

Region	Non Southern States		Border South		Deep South	
	mean	s.d.	mean	s.d.	mean	s.d.
homicide rate	2.93	2.83	5.87	4.13	6.57	5.92
white offender rate	1.10	1.09	2.01	1.35	1.77	1.86
Scots&Irish	1520.46	1389.60	999.47	493.56	412.13	391.17
Ireland	350.90	384.74	267.65	119.65	94.53	104.33
All non Scots-Irish	2398.18	4220.15	801.47	1628.80	261.35	720.77
av. an. murder rate per 100,000	3.02	2.85	5.86	4.44	6.57	5.93
av. an. murder rate per 100,000 - white offenders	0.99	0.92	1.24	0.73	1.09	0.90
log of aggregate earnings	22.03	1.32	21.59	1.43	20.05	1.38
Prop. pop. in urban areas	0.70	0.26	0.64	0.27	0.39	0.34
Prop. pop. Below poverty line	0.09	0.04	0.09	0.04	0.11	0.05
Prop. pop. black	0.01	0.02	0.05	0.04	0.07	0.04
fractionalization index	0.24	0.18	0.35	0.13	0.41	0.13
Gini	0.43	0.03	0.41	0.05	0.43	0.05
Slaves in 1790 per 100,000	456.72	681.31	3877.96	2369.37	12075.56	12956.75
sheep&pigs	2.36	2.07	1.83	0.48	2.11	0.74
Observations	93		17		40	

Table A4: Aggravated assaults and Scots-Irish Settlers–All and white offenders only

	1	2	3	4
	Aggravated assault rate		Aggravated assault, white offender rate	
Scots-Irish	0.641	0.829	0.227	0.252
	[0.544]	[0.620]	[0.313]	[0.315]
Border South*Scots-Irish		-5.797**		0.426
		[2.580]		[1.882]
Deep South*Scots-Irish		16.097***		5.589***
		[2.591]		[1.400]
Socio-demo and econ controls 200	yes	yes	yes	yes
Pop. 1790	yes	yes	yes	yes
Observations	149	149	149	149
R-squared	0.314	0.424	0.379	0.408

Notes to Table A4: all regressions with constant. All min regional effects controlled for. Standard socio-demographic and economic controls. Robust standard errors clustered at the state level. Source: 1790 and 2000 US census and UCR.

APPENDIX B: 1900 Census Analysis

Table B1: Correlations, Scots-Irish in 1790 and 1860 and Presbyterians in 1900

	Presb USA	Presb United States	Slaves, 1790	Scots-Irish,1790	Irish,1790
Presb USA	1				
Presb United States	-0.028	1			
Slaves, 1790	-0.102*	0.034	1		
Scots-Irish,1790	0.466*	-0.22*	-0.117*	1	
Irish,1790	0.388*	-0.195*	-0.092	0.722*	1
Scots-Irish names, Ferrie 1860 sample (i)	0.101*	-0.026	-0.1011	0.069	-0.003

Notes to Table 1: Ferrie 1860 sample refers to Joseph Ferrie's 1860 sample of males linked from the manuscript schedules of the 1860 Census to the manuscript schedules of the 1870 Census (Ferrie, 1996). This sample includes last names of 1,827 male adults. From: Matheson, R.E. (1901), I constructed an indicator of "Scots-Irish" name if the last name corresponds to last names which are predominant in Ulster and Scotland (dummy equal to one if the prevalence of the last name in Ulster represents more than two thirds of the prevalence of the same name over the whole of Ireland).

Table B2: 1900 Census: Presbyterians and Homicides

	1	2	3	4	5	6	7	8
	avg. annual murder rate per 100,000 00-07				White offender rate			
Presbyterian USA	-0.019	0.014	0.016***	0.015**	-0.003	0.006**	0.007***	0.006**
	[0.017]	[0.009]	[0.006]	[0.006]	[0.005]	[0.003]	[0.003]	[0.003]
Border South		0.793	0.196	0.084		0.309	-0.011	-0.03
		[1.356]	[1.224]	[1.261]		[0.656]	[0.649]	[0.668]
Deep South		5.637***	2.624***	2.530***		1.957***	1.436***	1.427***
		[1.068]	[0.701]	[0.809]		[0.304]	[0.325]	[0.384]
West		2.232**	2.256***	2.173***		1.806**	1.442***	1.451***
		[1.021]	[0.735]	[0.754]		[0.695]	[0.482]	[0.490]
Midwest		-0.259	0.577	0.593		-0.028	0.321	0.37
		[0.655]	[0.624]	[0.650]		[0.320]	[0.321]	[0.332]
Border South*presb		0.072*	0.016	0.045		0.050**	0.061**	0.086**
		[0.042]	[0.042]	[0.050]		[0.024]	[0.027]	[0.033]
Deep South*presb		**0.322****	**0.330*****	**0.354*****		**0.084*****	**0.067***	**0.085****
		[0.129]	[0.102]	[0.104]		[0.031]	[0.034]	[0.033]
West*presb		0.015	-0.050*	-0.050*		0.046**	0.015	0.012
		[0.027]	[0.027]	[0.026]		[0.019]	[0.017]	[0.016]
Midwest*presb		0.001	-0.014	-0.011		0.001	-0.003	-0.003
		[0.022]	[0.016]	[0.016]		[0.009]	[0.010]	[0.010]
Socio-demo and eco controls 2000	no	no	yes	yes	no	no	yes	yes
1900 controls	no	no	no	yes	no	no	no	yes
Total population 1900	yes	yes	yes	yes	yes	yes	yes	yes
Observations	2604	2604	2604	2546	2605	2605	2604	2546
R-squared	0.001	0.202	0.309	0.316	0.001	0.102	0.135	0.141

Table B3: 1900 Presbyterians and Herding

	1	2	3	4
	avg. annual murder rate		White offender rate	
Presbyterian USA	0.020***	0.019***	0.009***	0.009***
	[0.006]	[0.005]	[0.003]	[0.003]
Deep South	3.214***	3.398***	1.665***	1.851***
	[0.690]	[0.705]	[0.327]	[0.329]
sheeppigs_pc	0.435	0.616	0.045	0.205
	[1.070]	[1.058]	[0.579]	[0.567]
sheeppigs_pc*presb	0.001	0.001	0.001	0.001
	[0.001]	[0.001]	[0.000]	[0.000]
sheeppigs_pc*deeps	-0.477	-0.654	-0.044	-0.2
	[1.083]	[1.074]	[0.582]	[0.569]
Presb*deepsouth	-0.009*	-0.009**	-0.004**	-0.004***
	[0.005]	[0.004]	[0.001]	[0.001]
sheeppigs_pc*presb*deepsouth	0.037*	0.037*	0.015**	0.015**
	[0.019]	[0.019]	[0.006]	[0.006]
Socio-demo and eco controls 2000	yes	yes	yes	yes
Total population 1900	yes	yes	yes	yes
Controls 1900	no	yes	no	yes
Observations	1390	1367	1390	1367
R-squared	0.28	0.29	0.081	0.087

Notes to Table B2 and B3: All regressions with a constant. Robust standard errors clustered at the state level. ***: significant at 1%, **: significant at 5%, * significant at 10% level. Presbyterians scaled by 100.

Socio-economic and demographic controls 2000: log of aggregate earnings, proportion of the population in urban areas, Proportion of the population below or at poverty level, proportion of the population black, fractionalization index, Gini index).

1900 controls: black population, manufacturing wages, urban/rural.

Source: 1900 census, UCR.

Table B4: 1900 Census: Falsification I: Other religious denominations

	1	2	3	4	5	6	7	8	9	10
	Lutheran		Baptist		Latter Day Saints		Methodist		Roman Catholic	
	hom rate	white off	hom rate	white off	hom rate	white off	hom rate	white off	hom rate	white c
Religion	0.023***	0.008***	0.023*	0.009	0.876	0.830**	0.025***	0.009***	-0.002**	-0.002*
	[0.005]	[0.002]	[0.012]	[0.006]	[1.338]	[0.347]	[0.006]	[0.003]	[0.001]	[0.001]
Border South*Religion	-0.001	0.034**	-0.011	-0.003	-0.51	-2.055**	0.015	0.018*	0.001	0.005*
	[0.026]	[0.015]	[0.011]	[0.008]	[2.060]	[0.908]	[0.017]	[0.009]	[0.003]	[0.002]
Deep South*Religion	-0.049	-0.022	-0.012	-0.012	0.000	0.000	0.007	-0.004	-0.007***	0.000
	[0.062]	[0.018]	[0.014]	[0.008]	[0.000]	[0.000]	[0.019]	[0.006]	[0.002]	[0.001]
West*Religion	-0.145	0.021	-0.04	0.036	-0.881	-0.835**	-0.033**	0.014	-0.003	0.001
	[0.104]	[0.099]	[0.035]	[0.023]	[1.339]	[0.347]	[0.015]	[0.010]	[0.002]	[0.001]
Midwest*Religion	-0.015***	-0.004	0.025	0.015	-0.696	-0.768**	-0.011	-0.003	0.000	0.000
	[0.005]	[0.003]	[0.019]	[0.009]	[1.348]	[0.352]	[0.009]	[0.005]	[0.000]	[0.000]
Total pop. 1900	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Socio demo and econ controls 2000	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Controls 1900	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	2546	2546	2546	2546	2546	2546	2546	2546	2546	2546
R-squared	0.315	0.139	0.316	0.14	0.314	0.138	0.319	0.143	0.317	0.14

Notes to Table B5: See Notes to Table B2 to B4. Religious denominations scaled by 100. All regional main effects included.

Table B5: 1900 Census: Falsification II: Other violent crime

	1	2	3	4
	Rape rate		White offender	
Presb Church in the USA	-0.013	0.007	-0.008	0.003
	[0.013]	[0.016]	[0.007]	[0.008]
Border South*presb	0.152		0.112**	
	[0.113]		[0.043]	
Deep South*presb	-0.289		-0.135	
	[0.338]		[0.123]	
West*presb	-0.112*		-0.040	
	[0.060]		[0.034]	
Midwest*presb	-0.026		-0.007	
	[0.035]		[0.017]	
sheeppigs_pc*presb*deepsouth		0.014		0.001
		[0.011]		[0.004]
Total pop 1900	yes	yes	yes	yes
Socio-demo and eco controls 2000	yes	yes	yes	yes
Controls, 1900	yes	yes	yes	yes
Observations	2,546	2,543	2,546	2,543
R-squared	0.094	0.085	0.119	0.104

Notes to Table B5: See Notes to Tables B2 to B4.

APPENDIX C: Table C1: Robustness of main result to alternative specifications

	1 Hom rate	2 Hom rate	3 White off	4 White off	5 Hom rate	6 White off	7 ln(Hom rate)	8 ln(White off)
	Proportion of Scots&Irish				Log of Scots&Irish			
Border South	1.154	1.154	-0.380	-0.380	1.387	2.342	1.037	0.852
	[1.051]	[1.887]	[0.516]	[0.521]	[9.560]	[3.213]	[1.905]	[1.067]
Deep South	-3.572**	-3.572	-1.357**	-1.357**	-15.522***	-3.710**	-2.273**	-1.432**
	[1.192]	[2.247]	[0.528]	[0.660]	[4.549]	[1.351]	[0.798]	[0.476]
ScotsIrish (prop or log)	4.274	4.274	0.117	0.117	0.455*	0.073	0.096	0.035
	[2.733]	[3.072]	[1.283]	[1.448]	[0.228]	[0.101]	[0.069]	[0.046]
Border South*ScotsIrish	2.250	2.250	11.171	11.171	-0.059	-0.308	-0.105	-0.103
	[12.757]	[21.036]	[8.849]	[7.236]	[1.404]	[0.462]	[0.276]	[0.152]
Deep South*ScotsIrish	**119.170***	**119.170****	**36.828***	**36.828****	**2.693*****	**0.626****	**0.395*****	**0.240*****
	[62.266]	[56.080]	[19.876]	[16.278]	[0.854]	[0.238]	[0.116]	[0.075]
Socio-demo and eco controls, 2000	yes	yes	yes	yes	yes	yes	yes	yes
Observations	149	149	149	149	150	150	150	150
R-squared	0.457	0.457	0.408	0.408	0.497	0.410	0.365	0.317
s.e. clustered state level	yes	no	yes	no	yes	yes	yes	yes