Suffrage, Schooling, and Sorting in the Post-Bellum U.S. South.*

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Abstract

This paper estimates the political and economic effects of the 19th century disenfranchisement of black citizens in the U.S. South. Using adjacent county-pairs that straddle state boundaries, I first examine the effect of voting restrictions on political competition. I find that poll taxes and literacy tests each lowered overall electoral turnout by 10-23% and increased the Democratic vote share in national elections by 5%-10%. Second, employing newly collected data on schooling inputs, I show that disenfranchisement reduced the teacher-child and teacher-student ratio in black schools. Finally, I develop a model of suffrage restriction and redistribution in a 2-factor economy with occupational choice to generate sufficient statistics for welfare analysis of the incidence of black disenfranchisement. Consistent with the model, disenfranchised counties experienced a 7% increase in land and farm values per decade, despite a 4% fall in the black population share. The estimated factor market responses suggest that black labor bore a collective loss from disenfranchisement equivalent to at least 13% of annual income, much of which was transferred to landowners.
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1 Introduction

A core question in political economy is the economic incidence of democracy. Who wins and who loses from changes in democratic institutions? Authors from Barrington Moore (1966) to Acemoglu and Robinson (2006) have argued that economic interests are pivotal in the social decision to extend the electoral franchise. In particular, scholars have argued that landowners have been historically hostile to democratic transitions, owing to the economic effects of democracy on agricultural land and labor (Rueschmeyer, Stephens, and Stephens 1992). In this paper, I test this idea by estimating local factor market responses to changes in 19th century Southern U.S. political institutions and redistribution. The reduced form estimates together with a simple model quantitatively answer a fundamental question in social science: how much does formal disenfranchisement alter the distribution of income across factor owners?

Between 1870 and 1910, eleven Southern states passed legal restrictions on voting, such as poll taxes and literacy tests. These changes were aimed at lowering black electoral participation, but also affected poor whites. These suffrage restrictions in the U.S. South provide a unique opportunity to study the direct and indirect economic effects of changes in the electoral franchise. This paper is the first to estimate the impact of these within-country anti-democratic institutional changes on schooling and local factor markets. I use a spatial-discontinuity based identification strategy that controls for a variety of institutional features that may confound cross-country analyses, as well as unobservable variables that could bias within-country cross-state analyses (Besley et al. 2008, Husted and Kenny 1998, Miller 2008).[1] Historical data for counties that lie on state borders allow me to examine how changes in voting rights alter the mix of public goods available.

The impact of poll taxes and literacy tests on political competition, public good provision, and factor mobility is estimated using a panel of counties matched into adjacent county-pairs that straddle state boundaries.[2] The federal nature of the United States generates state-year variation in political institutions that normally only vary between countries, and the contiguous county-pair identification strategy controls for a variety of cultural and economic variables that are unlikely to respect state borders. Unobservable characteristics that vary continuously across state boundaries (such as labor market conditions, climate changes, local attitudes towards race, fear of white violence, underlying property tax base, or land productivity shocks) are all effec-

[1] A large cross-country literature is devoted to estimating the effects of democratic institutions on economic growth, redistribution, and inequality (Barro 1996, Przeworski 2000, Persson and Tabellini 2006, Gradstein and Milanovic 2006).

[2] This identification strategy has been used most recently by Dube et al. (2010) to estimate local labor market effects of minimum wages.

tively ruled out as competing explanations for the estimated effects. In addition, local variation allows me to plausibly assume that land is homogeneous and labor markets are integrated across treatment and control counties, so that the resulting land price and labor quantity (migration) responses can be interpreted as sufficient statistics (Chetty 2009) for the effect of disenfranchisement on factor owners. In the empirical analysis, I also address general equilibrium and spillover effects that may arise from focusing on economically integrated treatment and control counties.

To motivate the estimation strategy and interpret the results, I provide a simple 2-factor political economy model, linking political institutions and redistribution (Meltzer and Richards 1983) with occupational choice and endogenous migration (Banerjee and Newman 1998). The model predicts that following disenfranchisement, redistribution falls, inducing outmigration in the spirit of interjurisdictional competition (Tiebout 1956). The land price may rise or fall, depending on the labor market institutions, the extent of taxation, and the labor-intensity of agricultural production. Both competitive labor markets as well as endogenously segregated labor markets are examined as extensions to the baseline model. The model can be used to generate formulas that relate the land price and migration responses to the economic incidence of disenfranchisement on landowners and white and black labor.

Using the contiguous county-pair identification strategy, I find poll taxes and literacy tests lower turnout, increase the Democratic party vote share, and lower the teacher-child ratio for blacks, with no effect on the ratio of white teachers to children. My results on turnout and partisan voting are consistent with historical evidence that these disenfranchisement laws independently lowered black political participation.[3] The consequent fall in black educational inputs is consistent with many theoretical political economy models, including the one in this paper, as well as existing quantitative and qualitative research. The importance of low-quality southern schooling in explaining historical and persistent racial human capital and income differences is well documented (Margo 1990). The new data assembled here together with the identification strategy allow me to look at how variation in political institutions in the South determined the provision of education for black citizens.

[3]That the laws even affected political outcomes such as voter turnout is controversial. V.O. Key (Key 1949) held that the laws disenfranchising poor and black Southerners were largely rubber-stamping a *de facto* situation of low black and poor white turnout, suggesting that black political exclusion was a "fait-accompli" before 1890. Acemoglu and Robinson (2008) echo this perspective in their paper arguing that Southern elites used *de facto* power to maintain control despite the constraints of formal elections. Scholars since Kousser (1974) have documented voting laws' impact on turnout using larger datasets (Heckelman 1995, Redding and James 2001), although no paper has attempted to construct valid county-level control groups. The focus of the empirical literature on disenfranchisement has been using ecological regressions (Kousser 2001) to infer the extent to which blacks were disenfranchised relative to whites.

Besides public goods, the focus on integrated local economies also makes it possible to estimate the effects of disenfranchisement on land and labor markets. Despite the outmigration of black labor, the value of land increased in disenfranchised counties relative to adjacent counties where black Americans could vote more easily. Since land values are an asset price that reflect actual and expected future profits, this result suggests that landowners were beneficiaries of restricted voting in the U.S. South. While the empirical evidence highlights lowered redistribution as a main channel, landowners may have also benefited from increased segregation and discrimination in the labor market following black disenfranchisement. Unsurprisingly, black citizens, via reduced access to public goods as well as potentially many other discriminatory policies, bore the brunt of the welfare losses from disenfranchisement; my results suggest that poor whites were indifferent. These combined results shed light on key debates in Southern political history about whether poor or rich whites benefited the most from changes in Southern political institutions (Woodward 1951, Kousser 1974, Perman 2001).

The paper proceeds by reviewing the relevant literature from economics and political science in the next section. Section 3 goes over background on Southern history, describing the mechanisms tested in the paper. Section 4 provides a simple model that generates predictions about the effect of disenfranchisement on redistribution, migration, and land prices under different assumptions about the labor market. The model also generates simple formulas relating the reduced form estimates to welfare. Section 5 explains the identification strategy, which is based on contiguous county pairs, and discusses potential biases. Section 6 describes the various data sources and the construction of the education data. Section 7 presents results. Section 8 calculates the incidence of disenfranchisement across different groups and Section 9 concludes.

2 Literature Review

The political economy of democratic and non-democratic institutions has been the focus of much recent economics literature. Recent theoretical work has modeled the motivations for landlord opposition to democracy (Llavador and Oxoby 2005, Acemoglu and Robinson 2006). One explanation given is that the incidence of redistribution on an inelastic factor such as land motivates landowners to oppose extending the franchise. However, no scholars have estimated the economic incidence of within-country variation in democratic electoral institutions. Other work modelling the extension of the franchise includes Lizzeri and Persico (2004), Ades and Verdier (1996), and Bourguignon and Verdier (2001). In examining the effects of political reforms on economic outcomes, this paper is perhaps closest to Baland and Robinson (2009, 2008), who look at the effect of introducing the secret ballot on employer vote buying, and find that land

prices fell more in high-*inquilino* Chilean communas post-reform, as land no longer capitalized the ability to control *inquilino* votes. However, by looking separately at land and labor, this paper is the first to estimate within-country effects of franchise-restriction on the distribution of income across factor owners.

A few recent papers in economics have looked at Southern history for insights into the political economy of development, although none use the same data or identification strategy as this paper. Besley, Persson and Sturm (2009) look at state-year variation in the abolition of suffrage restrictions to estimate the effect of political competition on state-level economic growth. However, their sample period is well after the one considered here, and they do not consider the same margins of factor markets and public good provision. Similarly, Husted and Kenny (1997) examine the effect of voting restriction abolition on the size of government. Both of these papers study the 20th century removal of voting restrictions across states, while this paper looks at their earlier implementation and is able to control for a substantial amount of unobserved variation by looking at counties just across state boundaries. Rajan and Ramcharan (2009) look at the relationship between land concentration and financial underdevelopment in a cross-section of U.S. counties in 1930. Caselli and Coleman (2001) examine sectoral convergence between the South and the rest of the U.S., and attribute it to the relative contraction of the agricultural sector. Bleakley (2007) looks at hookworm eradication in the U.S. South for evidence on the efficacy of disease eradication programs. Acemoglu and Robinson (2008) also discuss the U.S. South as an instance of elites exercising *de facto* political control despite *de jure* democratic institutions. This paper continues the tradition of using the U.S. South to test hypotheses concerning development in general, and political economy issues in particular.

The connection between disenfranchisement and public good provision has been documented in a number of papers, for example Kousser (1980), Margo (1982), and Pritchett (1989), but each only examines a single state, and none look at factor market responses. The unequal provision of schooling in the South, and its consequences, has a comprehensive treatment in Margo (1990), complementing a large literature studying segregated schooling (Welch 1973, Orazem 1987, Card and Krueger 1992, Fishback and Baskin 1991). The economic history of the post-bellum U.S. South contains a vibrant debate on the extent of black labor market mobility (Ransom and Sutch 2001, Wright 1986, Higgs 1977, Naidu 2010). The role of interjurisdictional competition in providing the efficient level of local public goods has been an influential idea in economics since Tiebout (1956), and recent research has integrated local political economy into models of interjurisdictional sorting (Epple and Romer 1993). These themes were brought together by Margo (1991), who found that labor market mobility induced local jurisdictions in the South to provide some level of education to disenfranchised blacks. No paper has looked at the effect of

disenfranchisement on public good provision using inter-state variation and county-level data, perhaps because the county level schooling data has never before been compiled in the South.

Related to this paper is a literature that looks at variation in political representation by ethnicity or gender, finding that changes in the composition of the electorate or representatives induce substantial changes in public good provision, despite no changes in the underlying population (Duflo and Chattopadhyay 2004, Pande 2002, Gugerty and Miguel 2006, Besley et al. 2004). A particular instance from U.S. history is the introduction of women's suffrage, which Miller (2008) finds improved public health and infant mortality outcomes. Racial disenfranchisement, besides being important in American political development (King and Smith 2005), like Brazil's *Saraiva* law in 1881[4] and South Africa (particularly the Western Cape) after 1948, inspires a comparative politics literature on race and its interaction with political institutions (Marx 1998). More generally, elections in developing countries are often marred by systematic denial of votes to particular groups (Diamond 2008). This paper looks at the effects of changing political representation on public good provision, like previous papers, but also looks at indirect effects via market responses.

3 History and Background

The American Civil War (1861-1865) and the subsequent military occupation and Reconstruction[5] overturned Southern society, freeing and enfranchising a vast number of slaves with the 13th, 14th, and 15th amendments to the constitution.[6] Many of these institutional changes were implemented at bayonet-point, and only lasted in practice so long as the Union army remained willing to enforce the new constitutional amendments. With the withdrawal of Union troops in in 1870s, the rollback of black voting and civil rights began (also known as Southern "Redemption"). However, while the Democratic party, at the time controlled by elite Southern whites, successfully dominated state-level elections, it still had to contend with political competition from Republicans, Populists, and politically organized blacks. The federal government continued to prosecute white electoral fraud and violence. Locally, black sheriffs and politicians, often Civil War veterans, still held a measure of political power. Legal disenfranchisement, running into the early 20th century, was designed to eliminate this remaining electoral competition, and

[4] In fact literacy was a prerequisite to voting in Brazil until 1988. Brazil between 1982 and 1988 was another instance of the rare phenomenon of franchise restriction together with the persistence of multi-party elections. Most often non-democratic transitions occur via restricting party entry or abolishing elections wholesale.

[5] Reconstruction generally refers to the period between 1863 and 1877, when the Union army occupied the Southern states that had attempted to secede.

[6] While the 13th amendment abolished slavery and the 14th amendment guaranteed ex-slaves constitutional rights, it is the 15th amendment that expanded the franchise to all male citizens over the age of majority.

it further reduced government expenditure on black services such as schools.

3.1 Black Political Participation After the Civil War

Black Americans enjoyed a brief window of participation in electoral politics immediately following the Civil War. The extension of the franchise under military occupation did not, unsurprisingly, convince all Southern whites that ex-slaves should be allowed to participate in politics. The presence of Northern troops allowed the Republican party to incorporate blacks as a key political constituency despite widespread white hostility towards black enfranchisement. Once states were admitted back into the union, elections were fiercely contested, with the Democratic party platform centering on returning the South to "home rule".

Black participation in elections during Reconstruction was extensive, and overwhelmingly partisan. The Republican Party was the vehicle for black claims on the state for civil and political rights, as well as whatever redistribution they could secure. As late as 1876, black male turnout rates in Louisiana and South Carolina (the two states which have voting data by race) were 75% and 78% of the eligible population (King 2002, 2001). In fact, turnout rates during Reconstruction were much higher than in the next 50 years.

Political participation also brought representation. Foner (1988) lists 18 African Americans who served as state executives during Reconstruction. But the presence of black officials in local government mattered more for everyday black life, with blacks serving as justices of the peace, county commissioners, and sheriffs. Foner writes that "In virtually every county with a sizable black population, blacks served in at least some local office during Reconstruction ... assumed such powerful offices as county supervisor and tax collector, especially in states where these posts were elective." South Carolina, in 1868, had 74 black legislators out of 128, and it retained a majority black legislature until 1876.

With effective representation came redistribution, particularly in the form of public goods provision. Education was by far the most important of these, and the most sensitive to racial tensions. Schooling black Americans was a particularly sharp break from the pre-Civil War period, and one opposed by many Southern whites, both rich and poor. However, the Freedman's Bureau[7] and Republican state education superintendents saw public education as necessary for ex-slaves to gain human capital, as well as a substitute for politically infeasible land reform. An educated black population was also seen as an electoral block that would politically favor

[7]The Freedman's Bureau was a Federal agency that was intended to solve many of the problems faced by newly freed slaves, such as securing jobs and housing, but was disbanded in 1868.

the Republican Party. Republican educational superintendents levied property taxes to pay for an expanded education system, sometimes having to build school administrations completely from scratch. While constrained by hostility to taxes and racial integration, "Republicans had established, for the first time in Southern history, the principle of state responsibility for public education" (Foner 1988).

3.2 Redemption and Disenfranchisement

Southern Redemption in the mid-1870s began reversing many of the gains made by blacks during Reconstruction. Northern troops were gradually withdrawn, allowing the Ku Klux Klan and White Leagues, together with less organized white violence (often called electoral "bulldozing") to coerce black voters. The resulting tilt in the balance of power restored the Democrats to power beginning in the early 1870, a process completed with the 1876 Hayes-Tilden electoral compromise. Gerrymandering, local electoral changes and continued electoral fraud and force kept the Democrats in power. This came along with increased political representation of agrarian landowners and their favored policies. Thus, politicians cut taxes, reduced expenditure, and passed a slew of labor and tenancy laws that clearly favored landowners at the expense of merchants and workers (Woodman 1995). Redemption was a large blow to the political and economic rights of Southern blacks in particular. "In illiteracy, malnutrition, inadequate housing, and a host of other burdens, blacks paid the highest price for the end of Reconstruction and the stagnation of the Southern economy" (Foner 1988).

Despite this reassertion of white political power, Redemption did not create the "Solid South": effective one-party rule had to wait until after the franchise restrictions studied in this paper. Kousser (1974) writes that "The methods that the Democrats had employed to end Reconstruction had not caused either turnout or opposition to cease by 1880." Black representation, even at the federal level, persisted after Redemption. George Henry White, a black congressman from North Carolina, served from 1897 to 1901. Ten other Republican black congressmen, from North and South Carolina, Virginia, and Mississippi served in Congress between 1877 and 1900 (Middleton 2002). In North Carolina's Second Congressional District "hundreds of other blacks held lesser positions" (Anderson 1980). While the Republican party was severely diminished and blacks were largely denied direct representation, political competition still existed. Even when black votes were controlled or manipulated, it often involved making transfers to black political brokers or having to engage in a panoply of electoral manipulation tactics. Goldman (2001) provides data showing that federal prosecutions of 15th amendment violations continued with equal vigor post-1877, and this was a perpetual concern to Democrats during

the 1880s. To secure votes of blacks, patronage and public goods still had to be distributed, if perhaps in diminished quantities, and black legislators still "introduced resolutions that expressed black desires and demands for education" (Moneyhon 1985) into the 1890s.

The 1890s, sometimes referred to as the "Restoration", marked the beginning of uncontested Democratic rule and racial segregation enshrined in law. The focus of this paper is the legislative statutes and constitutional amendments enacted in this period that legally deprived Southerners of the right to vote. Historians and political scientists have discussed a number of motivations for legal disfranchisement. The first is a response to a wave of political challenges to the Democratic leadership. The Populist party in Georgia and North Carolina, fusion tickets between Republicans and Populists in Louisiana and South Carolina, and rival Democratic factions in other states all posed threats to the propertied whites that ran the Democratic party. The potential black votes to be tapped by "opportunistic" whites were a threat to the existing political elite. The threat posed by black political participation became clear with the large gains made by rivals to the Democratic leadership during the 1880s, when Independent and Republican parties won between a third and half of the vote in gubernatorial elections. This is a far cry from the overwhelming dominance Democrats would exercise post-1910, when turnout and non-Democratic votes were abysmally low until after the Civil Rights movement.

The adult male right to vote, established by the 15th amendment, came with a set of Enforcement Acts, designed to allow federal agents to police elections and repress Klan political violence. Recent scholarship has shown that effective and widespread federal enforcement of the 15th Amendment did not end after Redemption. Instead Cresswell (1987), Wang (1997), and Goldman (2001) have all shown that illegal electoral practices were prosecuted by the federal government into the 1890s. The Lodge "Force" Bill of 1890 would have increased the federal supervision of elections, and was the last Republican attempt to use the Federal government to secure black voting rights.

National Democrats successfully blocked passage of the Lodge bill, and proceeded to repeal the 1870 Enforcement acts in 1894. Republicans, preoccupied with Northern economic issues and foreign policy, acquiesced. With the abandonment of Republican support for black suffrage, Southern states were free to legally restrict the franchise without worrying about federal intervention. The Republican retreat from federal enforcement of electoral law is often given as a reason for the particular timing of Southern disenfranchisement. Importantly for my identification strategy, this was national legislation, and therefore exogenous to the county and state-level variation considered in this paper.

A third postulated determinant of black disenfranchisement is that the laws were just one of a set of social institutions implemented in the late 19th century as the South experienced a nadir of race relations. In this story, a cultural tide of anti-black sentiment swept whites in the South, generating a wave of lynchings, even more formal segregation laws, and formal political exclusion. Conjectured causes of the wave of racial tension include demographics (Rabinowitz 1978), lowered transportation and communication costs (Redding 2003), and changing Northern ideas about black economic and political rights (Richardson 2004). Again, much of this variation is at the national or regional level, and, to the extent that it varies within the South, it is unlikely to vary within the contiguous county pairs used in this paper.

3.2.1 Disenfranchisement Laws

The details of disenfranchisement varied from state to state. For example, in some states disenfranchisement was enacted via statute, while in others it was enacted by constitutional amendment. Generally, the poll tax required one to show a receipt for payment of the poll tax prior to voting registration.[8] While it was no more than 2 dollars, other features of the poll tax administration and context made it much more onerous than just the sum of money involved, although that alone was clearly costly for cash-strapped sharecroppers. Firstly, they often had to be paid between 9 and 6 months before the election. Secondly, in some states the tax was cumulative, so that all poll taxes for all preceding years of residence had to be paid before registering to vote.

Literacy tests generally consisted of a requirement to read a section of the national or state constitution prior to voting registration. In the low-education environment of the rural U.S. South, the literacy test was likely to bind for a large segment of the population, particularly for poor blacks and whites. Georgia's literacy test, for example, entailed being able to correctly read and write any paragraph of the state or U.S. Constitution. Virginia's test involved applying to the registrar "in his own handwriting" (Key 1949). While there were a variety of other pieces of disenfranchisement legislation passed simultaneously, the poll tax and literacy tests were the most important for restricting voting, and were the object of the 1965 Voting Rights Act.

3.3 Economic Effects of Disenfranchisement

> *There is no surer way to drive the best of them [Black Americans] from the state than by keeping up this continual agitation about withdrawing from them the meager educational opportunities that they now have. Their emigration in large numbers would*

[8] Ogden (1958) summarizes the poll taxes as they existed in the early 1950s.

result in a complication of the labor problem. -J.W. Joyner North Carolina School Superintendent 1910

Attributing the dismal state of Southern black education to the restricted franchise has a long history. Charles Dabney (1936), Horace Mann Bond (1934), and Louis Harlan (1968) all attributed discrimination in public education provision to political exclusion of African Americans. Statistically, the fall in the quality and quantity of black education following disenfranchisement has been shown in a number of papers. Margo (1982) uses Louisiana data and finds that disenfranchisement increased racial gaps in school expenditure. Kousser (1980a) finds similar results in North Carolina, where racial gaps in education expenditures jump sharply after disenfranchisement. As a counterfactual, Kentucky, the only state without voting restrictions, in fact passed an 1881 referendum proposal to equalize black-white schooling expenditures (Kousser 1980b), although it is unclear how binding it was.

Margo (1991) documents that black citizens migrated in response to school quality, and writes that "Although black parents could not vote at the ballot box, they could, and did, vote with their feet in search of schools for their children." In Lowndes county, Alabama, Foner and Lewis (1980) find "there [were] perhaps a hundred Negro farmers ... Not one of these men has been attracted away ... they remain on account of the good schools for their children." (Foner and Lewis, 1980, p. 241)

Political forces and redistribution were motivations for migration more generally. Faced with the loss of political representation and civil rights after Redemption, the first of the notable migration waves out of the South began. While small in actual numbers, the famous Kansas exodusters were the first large scale migration of blacks out of the South, in 1879-1880. Contemporaneous newspapers were stunned at the large movement of blacks out of the historically slave states. "Kansas Fever" was used to describe the understandable migration response to the *de facto* loss of civil and political rights that accompanied Redemption (Painter 1992). While the magnitudes involved in the Kansas migration wave turned out to be fairly small (Cohen 1991), it had an effect on national politics, even instigating the formation of a Senate Committee on the Colored Exodus. Just as interesting is the slightly later Indiana Exodus, which was portrayed in the Northern press as being explicitly for the purposes of winning political representation and redistribution (Richardson 2004). Hahn (2003) writes that black migration between Southern states leapt during the 1880s and 1890s, consistent with my argument in this paper, and that they were hoping for "better schools, better economic prospects, and better social circumstances."

Vulnerability to arbitrary white violence against person and property was another potential consequence of disenfranchisement, since local law enforcement was not accountable to blacks. Beck and Tolnay (1992) find that black migration responded to lynchings and racial violence, and some Southern communities improved the safety of blacks in order to increase the incentives to stay. While there would be no large scale outmigration of blacks until World War I, the mobility patterns documented in this paper are consistent with the existing evidence that black workers moved not just to find higher wages, but also in search of political representation and public goods. The Great Migration, triggered by both the push factors of disenfranchisement and political repression, as well as Northern labor demand shifts induced by World War I, resulted in a substantial improvement in school quality as counties realized that they were permanently losing labor (Margo 1991).

Landlords benefited from the restricted franchise in a variety of ways. Property owners reaped any tax savings allowed by reducing government expenditures on black public goods, and the elimination of political competition allowed for a slew of additional policies that favored rural landowners. Labor mobility restrictions, for example anti-vagrancy, emigrant agent licensing requirements, and anti-enticement laws (Naidu 2009, Cohen 1991, Bernstein 2001), as well as an extensive convict leasing system, kept agricultural labor costs low. In addition, the weak political institutions and one-party system of the post-disenfranchisement South allowed the easy translation of landowner wealth into political influence, ensuring extensive representation of landowners at all levels of government. At the federal level, disenfranchisement guaranteed an elite white lock on Senate and House representation, and landowners were effectively able to stymie federal intervention into the Southern political economy. As an example, Alston and Ferrie (1999), suggest that these Southern Democratic representatives were able to dilute the impact of many New Deal welfare programs, which they did to protect the private labor-market paternalism that guaranteed a steady workforce to agricultural employers.

The economic effects of disenfranchisement on poor whites is a controversial area in Southern history. While it is clear that some poor whites were disenfranchised by the laws, some states and counties were selective in enforcing them or had "grandfather clauses" that enabled whites of all classes to vote. However, while existing evidence suggests that whites as a whole benefited from a superior public-goods and taxation package following black political exclusion, scholars differ substantially over the distribution of these benefits between rich and poor whites. A contribution of this paper is to estimate the white public good provision and migration response to disenfranchisement, and interpret the latter as a measure of the revealed preference of poor whites for living under the post-disenfranchisement institutions. By comparing the magnitude

and sign of white migration to the appreciation of land value, I can use the market response to disenfranchisement as a novel lens on the distribution of gains between poor and rich whites.

4 A Simple Model of Suffrage Restriction

I construct a 1-period model of occupational choice in a small local jurisdiction, such as a county, where land is fixed and labor is mobile, as in a specific-factors economy. Assume a mass 1 of agents, indexed by α, which measures both the return from purchasing land and engaging in production, as well as migration. α is an index of wealth, although it could also measure human capital or ability. Blacks have less α than whites, on average. Besides land and labor markets, there is a local government that taxes production and redistributes revenue to citizens, according to a fixed, albeit wealth-biased, rule. The local tax policy is chosen by the median voter (Meltzer and Richard 1983), and it will be shown that preferences are single-peaked below (Black 1948). Poll taxes and literacy tests left-censor the distribution of α among voters, which increases the α of the median voter, resulting in lower taxes and redistribution to a smaller fraction of the population. Factor markets also respond, with labor leaving in response to the lowered redistribution and land prices rising because the lower taxes increase the returns to purchasing land and engaging in production. In the baseline version of the model I assume wages are exogenously fixed (assuming the county is integrated with a large labor market); I then endogenize local wages under competitive wage setting as well as politically chosen racially repressive labor market institutions.

Agents have linear preferences in total consumption, including both private income and local public transfers. Agents can work locally for an exogenous wage w, migrate, or engage in local production. Blacks have α distributed with a cumulative distribution function $F^B(\alpha)$, and the distribution of α for whites is given by $F^W(\alpha)$. Assume that θ^B is the fraction of the population that is black, so that the population distribution of α is given by the mixture $F(\alpha) = (1-\theta^B)F^W(\alpha) + \theta^B F^B(\alpha)$. F^B is first order stochastically dominated by F^W, so $F^B(\alpha) \geq F^W(\alpha)$. I restrict α to be positive, so that $F^W(0) = F^B(0) = 0$, and assume that F is strictly increasing. Thus blacks have lower α than whites, reflecting either lower education, discrimination in labor and product markets, or lower security of person and property. Agents have 1 unit of labor, and engaging in own production requires 1 unit of land, at price v, and k units of labor, each paid a wage w, in addition to own labor. There is a fixed supply of land $L < 1$. Migration, while disqualifying an agent from any local transfers they might be eligible for, earns a return $m\alpha$. This is consistent with the fact that higher human capital agents tended to migrate (Margo 1990), as well as the idea that migration costs were substantial and required wealth (Carrington et al. 1996). Below I will assume that m is sufficiently low

to ensure that taxes are never so high as to make a high α type choose migration over production.

Pre-disenfranchisement, I assume all agents can vote, and taxes τ are set by the median voter, with $\alpha_{med} = F^{-1}(\frac{1}{2})$. Disenfranchisement truncates this distribution at $\underline{\alpha} > 0$, so that the population of voters has α described by the truncated distribution $G(\alpha) = \frac{F(\alpha)-F(\underline{\alpha})}{1-F(\underline{\alpha})}$. Thus the post disenfranchisement median voter is given by $\alpha_{med'} = G^{-1}(\frac{1}{2}) = F^{-1}(\frac{1+F(\underline{\alpha})}{2}) > \alpha_{med}$. Therefore disenfranchisement shifts the pivotal or decisive voter α_p from the median of F to the median of G, which corresponds to a new percentile p' of F, where $p' = \frac{1+F(\underline{\alpha})}{2} > \frac{1}{2}$.

Write taxable (property) income as:

$$R \equiv \int_{F^{-1}(1-L)}^{\infty} \alpha dF(\alpha)$$

This expression captures the fact that only the top mass L of the distribution engages in production, and they each produce α. Since land in is fixed supply, government revenue is a fraction τ of total taxable income.

Transfers occur in the form of schooling, of which agents consume a fixed amount. Paying for schooling requires expenditure c per capita, which is exogenous. Government revenue pays for schooling, but unequally, beginning with the agents with the highest α and adding schooling for each agent until the government revenue is exhausted. This rule, besides being tractable, also captures historically plausible bias towards wealthier (and thus whiter) agents in government expenditure.[9] Thus only the agents with $\alpha > \overline{\alpha}$ given by:

$$\tau R = c(1 - F(\overline{\alpha}))$$

will receive government expenditures. Thus, even non-producers have heterogeneous interests in taxing production, which would not be true if there was an equal disbursement of government revenue across agents. This lets us restrict attention to a 1-dimensional policy space for the basic results, which is necessary to invoke the median voter theorem without more assumptions on preferences. While probabilistic voting or other political equilibrium concepts could be used, the median voter model remains the most transparent and tractable. In order to obtain single-peaked preferences, assume a small administrative cost of taxation $\epsilon\tau$ that reduces per-capita expenditures. If there was no administrative cost, or if the administrative cost cut into total revenue rather than expenditure, then agents would be indifferent among all the tax rates that gave them c; the ϵ guarantees that each agent strictly prefers the *lowest* tax rate that

[9] In practice this would have looked like geographically targeted schooling expenditure across school districts within a county.

ensures they get the government transfer.

The government transfer received by an agent of type α is:

$$t(\alpha) = \begin{cases} c - \epsilon\tau & \text{if } \tau R \geq c(1 - F(\alpha)) \\ 0 & \text{if } \tau R < c(1 - F(\alpha)) \end{cases}$$

In order to economize on notation, let ϵ be arbitrarily small[10], then the preferred tax rate of an agent with endowment α (provided $F(\alpha) < 1 - L$) is just enough to cover them.[11]:

$$\tau(\alpha) = \frac{c(1 - F(\alpha))}{R} \tag{1}$$

τ is decreasing in α, so richer agents favor lower taxes. If the decisive percentile is $p < 1 - L$, then the taxes are:

$$\tau(\alpha_p) = \frac{c(1 - p)}{R} \tag{2}$$

From this it is immediate that $\frac{d\tau}{dp} = -\frac{c}{R}$, so that increases in the decisive percentile reduce the chosen level of taxes, as in Figure 1.

If producers receive government transfers, the returns from local production, including taxes and transfers are given by:

$$(1 - \tau)\alpha - v - kw + c \tag{3}$$

Instead of producing, agents can migrate, perhaps to a city or the North, and this gives returns αm, foregoing any possible local transfers. I assume that $1 - \frac{c}{R} > m > 0$, so that the gross after-tax returns from production are always greater than the returns from migration, to ensure that sufficiently high α types always choose production over migration, regardless of the tax rate.

Finally, if agents stay and work locally, they earn the exogenous wage w plus transfers c if they are eligible. If they are ineligible for transfers and choose to stay, they simply receive w.

The following assumption states that the median voter is a local worker, and that the next best alternative for the marginal producer is migration:

$$\frac{1}{2} < F(\frac{w + c}{m}) \leq F(1 - L) \tag{4}$$

[10]Results are the same with non-trivial ϵ.

[11]If $F(\alpha) > 1 - L$ then the preferred tax rate is $\frac{c(1-F(\alpha))}{R}$ for $\alpha \leq \alpha^{**}$ where α^{**} solves $(1 - F(\alpha^{**}))\alpha^{**} = R$. If $\alpha > \alpha^{**}$ then the preferred tax rate is 0; the government transfer is not worth the loss of revenue.

4.1 Solving the Model

The cutoff $\alpha^*(\tau, v)$ for entering production satisfies:

$$(1-\tau)\alpha^* - v - kw + c = max(\alpha^* m, w + c) \tag{5}$$

Assume a competitive market for land, so that land demand is given by $(1 - F(\alpha^*(\tau, v))$; and land supply is fixed at $L < 1$, so the price of land is given implicitly by:

$$F(\alpha^*(\tau, v)) = 1 - L \tag{6}$$

(4) together with (5) results in the following expression for α^*

$$\alpha^* = \frac{v + kw - c}{1 - \tau - m} \tag{7}$$

Plugging this into formula for the land price given by (6) and solving yields:

$$v = (1 - \tau - m)F^{-1}(1 - L) - kw + c \tag{8}$$

Note that the land price effectively rations land so that $\alpha^*(v, \tau) = F^{-1}(1 - L)$. Thus, with exogenous wages, the land market ensures that the fraction of agents engaging in production is fixed at L, changing prices to make the marginal producer indifferent between production and migration.

Agents migrate if $w + c < \alpha m$ if they are receiving expenditures c. Otherwise they migrate if $w < \alpha m$. Thus the cutoff $\alpha_*(c, w)$ for agents receiving transfers to migrate satisfies:

$$\alpha_* = \frac{w + c}{m} \tag{9}$$

Since agents only receive transfers c if they are in or above the decisive percentile p (i.e. $\alpha \geq \alpha_p$, where α_p denotes the value of percentile p), I define white and black per-capita government expenditure as

$$e^B(p) \equiv c(1 - F^B(\alpha_p))$$
$$e^W(p) \equiv c(1 - F^W(\alpha_p))$$

The fraction of each subpopulation i migrating is given by:

$$M^B \equiv F^B(\alpha^*) - F^B(\alpha_*) + min(F^B(\alpha_p), F^B(\alpha_*)) - F^B(\frac{w}{m})$$
$$M^W \equiv F^W(\alpha^*) - F^W(\alpha_*) + min(F^W(\alpha_p), F^W(\alpha_*)) - F^W(\frac{w}{m})$$

The migration expressions can be understood as the fraction of the population who would always migrate, plus the population fraction that loses transfers and have sufficiently high α that migration dominates staying once they lose eligibility for local transfers. If no agents were only kept from migrating by the local transfers, then $min(F^i(\alpha_p), F^i(\alpha_*)) = F^i(\alpha_*)$, and there is migration response to disenfranchisement. The fraction of agents that respond to disenfranchisement by migrating are those who have α high enough to benefit from migration were it not for the transfers.

Figure 1 illustrates the partition of α that results from the model. There are four resulting groups, ordered by α. At the top there are agents that that engage in own production. Below that are agents that always migrate, regardless of whether or not they are eligible for transfers. Next are agents who only migrate when they lose access to government transfers. Finally there is the set of agents who have α so low that they never migrate from the local jurisdiction.

Recall that disenfranchisement moves the decisive voter from $p = \frac{1}{2}$, the median voter, to p', where $\frac{1}{2} < p' < F(\alpha^*)$, as p' is the median of a lower-truncated F. Inspection of (8), (2), (10), and (10) immediately yields the following proposition, which states the key comparative statics of the model:

Proposition 1: Suppose that $\frac{1}{2} < p' < F(\alpha^*)$, then:

- $\Delta\tau = \tau(p') - \tau(\frac{1}{2}) = -\frac{c}{R}(p' - \frac{1}{2}) < 0$
- $\Delta e^i = e^{i'} - e^i = c(F^i(\alpha_{med}) - F^i(\alpha_{p'}) < 0$
- $\Delta v = v' - v = -\Delta\tau\alpha^* = \frac{c\alpha^*}{R}(p' - \frac{1}{2}) > 0$
- $\Delta M^i = M^{i'} - M^i = min(F^i(\alpha_{p'}), F^i(\alpha_*)) - min(F^i(\alpha_{med}), F^i(\alpha_*)) \geq 0$ with strict inequality if $p' > F(\frac{w}{m})$

The $p' > F(\frac{w}{m})$ assumption in the last part of the proposition ensures that there are some agents who migrate following the shift of the median voter from $p = \frac{1}{2}$ to p'. The predictions of Proposition 1 are illustrated in Figure 1. Disenfranchisement moves the median voter from $\frac{1}{2}$ to p', which lowers the tax rate τ. Since the land supply is fixed, the land price v adjusts to keep the marginal producer, α^* indifferent. Since the mass of agents greater than the decisive percentile falls, government expenditures fall. If there are any agents with α below the new decisive percentile p' who were not migrating because of the local transfer (i.e. $\alpha > \frac{w}{m}$), then

they now migrate.

The model so far does not impose enough structure to sign the relative impacts of disenfranchisement on whites vs blacks. First order stochastic dominance only implies that poor whites migrate only if poor blacks are leaving.[12] If I make the slightly stronger assumption that the black pdf of α, $f^B(\alpha)$ is greater than the pdf for whites $f^W(\alpha)$, I can obtain sharper predictions about the relative effects of disenfranchisement on whites and blacks:

Proposition 2: If $f^W < f^B$ for all α such that $\frac{w}{m} < \alpha < \alpha^*$, then the effects of disenfranchisement are larger in magnitude for blacks than whites. i.e.

$$\begin{aligned} \frac{de^B}{dp} &< \frac{de^W}{dp} \\ \frac{dM^B}{dp} &\geq \frac{dM^W}{dp} \end{aligned}$$

This proposition can be seen by differentiating (10) and (10) with respect to p, and says that if the density of blacks is higher than whites in the range of α where disenfranchisement has an impact, then the loss of government expenditure and migration of blacks will be larger for contractions in the franchise. This is because the *change* in the population who receives government transfers depends on the density of agents between the old median voter and the new p', and this then determines the change in the fraction of the population that migrates.

4.2 Local Labor Markets: Competitive and Segregated

The model so far has held wages exogenous, because it is plausible to assume that a disenfranchised county's labor market is integrated with the neighboring counties, so wages can be taken as given. A stronger assumption that also implies exogenous wages is that agricultural labor markets were well-integrated within the entire South, and so each county can be seen as a small open economy with respect to labor flows. While this stronger assumption is consistent with some economic historians, such as Wright (1986) and Higgs (1977), this has been contested by other historians (Mandle 1978). Thus, this section allows for endogenous local wages, and examines the robustness of the comparative statics from Proposition 1 to alternative specifications of the local labor market.

First I model competitive markets, where the wage adjusts to compensate workers for the loss

[12]The first-order dominance of F^W over F^B implies that there exists p such that $F^W(\alpha_*) < p < F^B(\alpha_*)$, therefore $M^{W'} > M^W$ implies $M^{B'} > M^B$, but not the converse.

of government transfers that accompany disenfranchisement. Disenfranchisement thus results in increased wages, which reduces the incentives to produce, which makes purchasing land less attractive. If this compensating wage effect is sufficiently high relative to the fall in taxes, then land prices may in fact fall after disenfranchisement. Next, I propose a historically more accurate model, where disenfranchisement is followed by voting over black labor market repression. I collapse a variety of institutions, such as convict labor, anti-enticement and vagrancy laws into a single parameter that reduces black wages. If disenfranchisement changes the median voter from a black agent to a poor white agent, then black wage repression increases. If black labor-supply elasticity to a county is low, for example owing to lack of outside options for blacks, then the overall wage bill falls, which is sufficient for the price of land to increase post-disenfranchisement.

Consider first the competitive case, where the wage adjusts to keep labor demand equal to labor supply. Labor demand is fixed at Lk. Labor supply is given by $F(\frac{w+c}{m})-min(p-F(\frac{w}{m}),0)$, which is the total population of non-migrants (the second term captures the migrants that leave due to ineligibility for government transfers) and non-producers. Market clearing then imposes:

$$Lk = F(\frac{w+c}{m}) - min(p - F(\frac{w}{m}), 0) \tag{10}$$

When p increases, the right hand side decreases if newly ineligible agents outmigrate, so w adjusts upwards to keep the market at equilibrium. From (8) one can see that this will lower the price of land, as production becomes costlier, potentially countervailing the benefits from reduced taxation. Thus the following:

Proposition 3: If $\frac{1}{2} < F(\frac{w}{m}) < p'$ and wages are set in competitive local labor markets, then a) wages rise after disenfranchisement and b) the effect of disenfranchisement on the price of land is ambiguous.
Proof: See Appendix.

If $k\Delta w > 0$ is sufficiently large, then Δv could be negative, which implies that the land price falls following disenfranchisement. Intuitively, this is more likely to happen when the induced outmigration is large relative to the change in the decisive percentile, when the tax-burden (c) is low, or when production is labor intensive, in the sense of high k. [13]

Disenfranchisement in the U.S. South occurred in the context of labor market segmentation

[13] By making parametric assumptions about F, I can obtain precise conditions under which the land price rises or falls. For example if α is uniform on $[0, A]$, so $F(\alpha) = \frac{\alpha}{A}$, then $w = \frac{m(ALk+\frac{A}{2})-c}{2}$ and $w' = mALk - c$, so $\Delta w = w' - w = \frac{mALk-c}{2} - \frac{mA}{4}$ so $\Delta v = \frac{c}{R}F^{-1}(1-L)(p' - \frac{1}{2}) - k(\frac{mALk-c}{2} - \frac{mA}{4})$. This implies that if $Lk < \frac{2c}{mA} + \frac{1}{2}$ then aggregate labor demand is inadequate so that wages still fall post-disenfranchisement, and land prices increase.

and wage repression for black workers, both due to norms of racial discrimination in outside labor and credit markets as well as labor market policies (Naidu 2009, Roback 1984, Cohen 1991). Thus, the assumption that wages could freely adjust to compensate for the lower public goods available in a county may not capture the institutional features of the post-bellum rural South. Restrictions on employer competition or vagrancy laws that depress wages may also allow landowners to profit from a lower post-disenfranchisement wage-bill despite losing some workers with good exit options.

This can be modeled extremely simply by assuming that the policy space consists not just of the tax rate τ but also a black wage deduction $e \in [0, \overline{e}]$. This deduction is meant to capture, in a reduced-form way, the panoply of laws (and norms sustained by those laws) that came along with black disenfranchisement and lowered black wages. This could include occupational segregation, wage discrimination by employers, or institutions such as convict labor and anti-enticement laws that depress black wages below competitive levels. By selective application to blacks, it induces more black outmigration, and thus raises white wages. While poor whites would favor setting net black wages as low as possible, producing whites would want to trade off the lower wages for blacks with the loss of black labor and the higher wages paid to locally working whites.

Thus post-disenfranchisement wages for blacks are given by $w'(e) - e$, while white wages are simply $w'(e)$, which is increasing and given implicitly by:

$$Lk = (1-\theta^B)F^W(\frac{w'+c}{m}) + \theta^B F^B(\frac{w'+c-e}{m}) - min(p' - (1-\theta^B)F^W(\frac{w'}{m}) - \theta^B F^B(\frac{w'-e}{m}), 0)$$

The following proposition provides assumptions that guarantee that a political equilibrium exists and that labor costs fall with more black wage repression:

Proposition 4: If $\inf F^{B-1}(1) < \sup F^{W-1}(0)$, $1 - L > p' > \theta^B > \frac{1}{2}$, and the supply elasticity of black labor to a county is sufficiently low, then:

- a) a political equilibrium in the policy space τ, e exists.
- b) τ falls and e increases from 0 to $\overline{e}$ post-disenfranchisement.
- c) White wages $w(\overline{e})$ rise, while black wages $w - \overline{e}$ fall relative to $w(0)$.
- d) land prices increase post-disenfranchisement.

Proof: See Appendix.

The proof follows by first establishing that preferences over τ and e satisfy single crossing in

α, therefore a median voter exists (Gans and Smart 1996). Disenfranchisement shifts the median voter from a black agent to a non-producing white, inducing an increase in e from 0 to $\overline{e}$, and if black outmigration is not too high, then the wage bill to producers falls and land prices increase. Part c) suggests that, with the restricted mobility for blacks in the U.S. South, wage repression could occur without losing too much of the black workforce, thereby allowing producers to doubly benefit from disenfranchisement: lower wages for workers and lower taxes for themselves.

This proposition captures an important feature of Southern black disenfranchisement. By increasing the political power of poor whites, in a time and place where blacks had difficulty relocating (owing to both formal constraints, such as emigrant agent laws, and informal constraints such as discrimination in transportation, credit and housing markets), landowners could benefit from the labor market discrimination imposed on blacks by poor whites. This suggests that restricted mobility of blacks was a key condition for a coalition between landowners and poor whites in favor of black disenfranchisement. Otherwise landowners, fearing the loss of black labor, would have opposed the harsh labor market policies chosen by poor whites, and thus would not have favored institutional changes that increased the latter group's power.

4.3 Welfare and Distribution

Besides generating predictions, the model can be used to translate estimated effects of disenfranchisement on land prices and labor migration into economic welfare. I partition the distribution of α into landowners (L), poor whites (PW) and poor blacks (B). While I do not assume that blacks owned no land, the propositions in this section do not depend on this. Black ownership of land was minimal in 1870-1880, and even by 1920 blacks owned much less and much worse quality land than whites (Higgs 1977).

If the consumption of an agent of type α is $y(\alpha)$, one can write aggregate welfare W as a function of the decisive percentile p as:

$$\begin{aligned} W(p) &= \int y(\alpha)dF(\alpha) \\ &= \int_{\alpha^*}^{\infty} (1-\tau(p))\alpha - v - kw + cdF(\alpha) + \int_{\alpha_p}^{\alpha^*} \max(w+c, \alpha m)dF(\alpha) + \int_{0}^{\alpha_p} \max(w, \alpha m)dF(\alpha) \end{aligned}$$

The historically relevant groups are landowners, poor whites, and poor blacks, and so I

unpack the last two terms by race, rewriting welfare as:

$$\begin{aligned} W(p) &= \int_{\alpha^*}^{\infty} (1-\tau(p))\alpha - v - kw + cdF(\alpha) \\ &+ (1-\theta^B)\int_{F^{W-1}(p)}^{\alpha^*} \max(w+c, \alpha m) dF^W(\alpha) + (1-\theta^B)\int_0^{F^{W-1}(p)} \max(w, \alpha m) dF^W(\alpha) \\ &+ \theta^B \int_0^{F^{B-1}(p)} \max(w+c, \alpha m) dF^B(\alpha) + \theta^B \int_0^{F^{B-1}(p)} \max(w, \alpha m) dF^B(\alpha) \end{aligned}$$

We can write aggregate welfare as the weighted sum of welfare across landowners (L), poor whites (PW), and blacks (B):

$$W(p) = (1-F(\alpha^*))W^L(p) + (1-\theta^B)F^W(\alpha^*)W^{PW}(p) + \theta^B F^B(\alpha^*)W^B(p)$$

Where

$$\begin{aligned} W^L(p) &= \int_{\alpha^*}^{\infty} (1-\tau(p))\alpha - v - kw + cdF(\alpha) \\ W^{PW}(p) &= \int_{\alpha_p}^{\alpha^*} \max(w+c, \alpha m) dF^W(\alpha) + \int_0^{\alpha_p} \max(w, \alpha m) dF^W(\alpha) \\ W^B(p) &= \int_{\alpha_p}^{\alpha^*} \max(w+c, \alpha m) dF^B(\alpha) + \int_0^{\alpha_p} \max(w, \alpha m) dF^B(\alpha) \end{aligned}$$

Since landowners lie in the right tail (defined as the part of the distribution where $\alpha > \alpha^*$) of the F distribution, by making a parametric assumption about the shape of the right tail, I can relate the observed estimates of the land price to the average welfare of landowners. The land price rations the entry into production, so that it makes the marginal producer indifferent between production and migration. Therefore the change in the land price measures the change in welfare of the marginal producer. If I assume a specific shape for the right tail of F, the marginal producer's welfare can be related to the average producer's, and thereby an estimate of the aggregate incidence of disenfranchisement on landlords can be obtained from the estimate of the effect of disenfranchisement on the price of land. The Pareto distribution has the unique property that the ratio of the marginal α to the conditional average α is constant, a fact exploited by Saez (2001) for calculating optimal tax rates. This yields the next proposition:

Proposition 5: If wages are exogenous, and the right tail of $F(\alpha)$ is a Pareto distribution with shape parameter $b > 1$ and scale parameter $a < \alpha^*$, then $\frac{1}{b-1} \times \frac{dv}{dp}$ is a sufficient statistic for the change in average landowner welfare, $\frac{dW^L}{dp}$.

Proof: See Appendix.

Migration in this model does for labor what the land price does for land. While with land, quantity is fixed and the price varies, with migration, price (wage) is fixed and the quantity varies. In both cases, however, the effect of disenfranchisement on the marginal decision maker is informative about the welfare effect on the entire group. However, discerning the distribution of α for the population of potential migrants is much harder, as it is unlikely to follow a tractable Pareto-like distribution. Instead, I use the migration response to bound the welfare impact, and obtain the following proposition:

Proposition 6: Suppose $\frac{1}{2} < p' < F(\frac{w+c}{m})$, wages are exogenous, and c is the per-capita expenditure per capita. Then $-c\frac{dM^B}{dp}$ is a lower bound on the welfare loss of black workers $\frac{dW^B(p)}{dp}$, and $-c\frac{dM^W}{dp}$ is a lower bound on the welfare losses of poor whites, $\Delta W^{PW}(p)$.
Proof: See Appendix.

5 Identification Strategy: Contiguous County Pairs

My identification strategy relies on matched adjacent county-pairs that lie on state boundaries. This empirical strategy extends the spatial discontinuity methodology of Holmes (1998), Dube et al. (2009), and Duranton et al. (2007) to estimate the effect of disenfranchisement on political and economic outcomes. The sample consists of counties that lie on state borders in 1870, as shown in Figure 3. Counties are then matched into adjacent pairs p. Note that the same county can be in multiple pairs. Therefore the same county is included multiple times, which induces correlations in the unobservables across county-pairs. Multidimensional clustering (Cameron et al. 2006) is used to adjust the standard errors for both within-state over time correlations of county residuals, as well as within border-segment (the set of counties on both sides of a given border) within-year correlations. This not only accounts for the multiple instances of a given county in the data, but also the cross-pair correlations in the error term that can propagate, via the multiple county pairs a county can be part of, over the entire border segment.

I create two samples, one consisting of all border counties, the other restricted to pairs in which the core dependent variables are available for both counties in a pair over all the sample years. The core variables are presidential turnout, presidential fraction Democratic, black and white teacher-child ratios, land value per acre, and log fraction black. On each sample I estimate the following model for a variety of outcome variables y:

$$y_{p(c)cst} = \beta(D^P_{st} + D^L_{st}) + \sum_{t=1870}^{1920} \alpha_t X_{c,1860} + \delta_c + \delta_{p(c)t} + \epsilon_{p(c)cst} \tag{11}$$

Where c indexes county, $p(c)$ denotes a county adjacent to c from another state, s denotes state,

and t denotes year. D^P_{st} and D^L_{st} are dummies denoting the presence of a poll-tax and literacy test, respectively. $X_{c,1860}$ denotes a vector of county characteristics in 1860, and includes urbanization, fraction slave, and total population in 1860. δ_c denotes a county fixed effect, and $\delta_{p(c)t}$ denotes a county-pair cross year fixed effect.

For all of these regressions I report the estimate of β, which is the effect of an additional poll tax or literacy test. As the laws are highly collinear, particularly when looking at census year variation, there is little independent information in the individual dummies. In a previous version of the paper the two laws were estimated separately and the linear combination of the two was reported; results are qualitatively similar, with slightly smaller standard errors.

5.1 Threats to Identification

While the county fixed effects control for any time-invariant county characteristics, it is the pair-year fixed effects that provide the primary identification in this empirical model. Spontaneous racial violence, time-varying geographic or climatic conditions, land productivity, labor market shocks or cultural values are all unlikely to respect state borders, and thus the within-pair identification effectively deals with these sources of potential bias. My identification strategy is particularly important for the economic outcomes, as agricultural land, climate and usage patterns are likely highly variable across counties. In addition, labor market conditions are also highly heterogeneous across space, something the pair-year fixed effects control for. In the context of the American South, a key confounding variable is racist cultural values or discriminatory beliefs, which are also unlikely to vary discontinuously at the state boundaries.

However, there are potential confounds to the identification strategy. Other state-year legislation that is contemporaneous with disenfranchisement is the most obvious source of potential bias. While legislation passed after disenfranchisement was likely the results of a shrunken electorate, and therefore part of the changed political equilibrium induced by disenfranchisement, it is not possible to rule out all unobserved state-year variation that may have caused changes at the state border. As discussed in the historical background section, however, the main source of unobserved state-year variation likely correlated with disenfranchisement is the political threat to the Democratic party. The event-study evidence below will suggest that this is not a confound in the border sample.

The one set of laws that were roughly simultaneous with disenfranchisement were railroad segregation laws, which are unlikely to explain the pattern of results seen in this paper. In addition, railroad segregation would imply heterogeneous effects on migration (and perhaps

land values) in counties with railways, of which I find none. Finally, disenfranchisment implied a whole suite of additional policies, discussed above. Therefore, the policies that vary at the state-year level but are subsequent to disenfranchisement are likely endogenous to the new political equilibrium created by suffrage restriction, and thus are part of the estimated coefficients.

Another potential confound is unobserved county-year variables that vary at state boundaries that could contaminate the effects estimated here. Relevant factors that vary include particularly racist or lenient sheriffs or county registrars, differential landlord control of local politics, or local black political power. Some of this can be examined by looking at heterogeneity on observable variables, but inability to rule out all other sources of county-year variation is a key limitation of this research design.

A further problem with interpreting the estimates arises from potential general equilibrium effects, as treated counties are being compared to their spatially contiguous neighbors, which are most vulnerable to spillover or substitution effects from treatment. Particularly with respect to migration, my results may be overstating the true effect. I address this by looking at various sources of heterogeneity in migration and transportation costs.

6 Data

Data on poll-tax and literacy test laws is obtained from Kousser (1974), Grofman and Davidson (1993), and Ogden (1958). Figure 2 shows the increase in voting restrictions between 1870 and 1920, my key source of independent variation. I obtain county-decade-level data for Southern states (census regions 31, 32, and 33) from 1870 to 1920. The sample period is chosen to be post-Civil War and pre-Depression, since these two events that radically altered Southern society.

County pairs are formed using the 1870 census boundary file map, downloaded from the National Historical Geographic Information System at `www.nhgis.org`. ArcGIS is used to first find the set of southern counties that are touching state boundaries. Then for each county in the resulting sample, the counties that are tangent to that county are selected. Each border county is therefore matched into $n \geq 1$ adjacent counties. The sample is restricted to the county-pairs where each county belongs to a different state. Homogeneous 1870 counties are constructed by intersecting all the census maps from 1870 to 1920, matching the resulting polygons to the other data for the relevant year, and then averaging the polygons over the 1870 county boundaries, weighting by the polygon's share of the 1870 county area.

Historical election returns for presidential returns are from ICPSR. Congressional and gu-

bernatorial returns are provided by Jim Snyder, and used previously in Hirano and Snyder (2008). County-level agricultural and population census data is obtained from ICPSR and Michael Haines.

6.1 Constructing the Education Data

To construct the education variables, I draw the relevant variables (teachers, pupils, and eligible children (aged 5-20) by race and gender) from the 1890 census, which was the first census to collect education data at the county level. Unfortunately, the 1890 census microdata was destroyed, but the individual 10% IPUMS sample is available for the other census years, and they are used to construct analogs to the 1890 variables. Note that these are not directly comparable, as the 1890 numbers are not constructed by aggregating the individual schedules, but instead are compiled from state-level education reports. The other years are likely to be unrepresentative due to undersampling, as only the 10% census sample is available, and self-reported occupation is used rather than administrative reports. While this should not effect the point estimates, the mismeasurement in the census is likely to increase the standard errors.

State education reports were collected for available years closest to census years and data from additional education reports collected by Morgan Kousser was added. The reports are highly idiosyncratic and often report very different information for each state, particularly in the early years. While there exists a great deal of data, for example teachers' wages or value of school property in some states for some years, very few variables exist for all Southern states over all census years in my sample. The variables selected are those that can be compared with the data constructed from the census.

The data from the state education reports is combined with the census variables. From the reports, white and black teachers, pupils, and eligible students are extracted. Often the eligible students are from the most recent census, so the data is occaisionally redundant. Then, for each decade, the mean and the median of all the state education report variables is calculated and then averaged with the census values. This increases the weight of the census variables, increasing the comparability of the estimates with other census variables. However, the school attendance variable in the census is a) inconsistently coded across census years, and b) can mean having attended for as little as 1 day. Since black school participation was likely influenced by transitory labor demand shocks, and the state education reports are often also unreliable, the median (rather than the mean) value of the pupils variable over the decade is used alone, as well as averaged with the census. The final variables are a) teacher-child ratios, using mean and median values from the state education reports averaged with the census, and b) teacher-pupil

ratios, using the decade median from the state education report alone and averaged with the census value.

7 Empirical Results

Some basic patterns can already be seen in the summary statistics, presented in Table 1. Turnout in all elections decreases as the number of disenfranchisement laws increases, as does the vote share of Democrats. Teacher-child ratios for blacks fall, while those for whites rise. Farm and land values increase as the number of disenfranchisement laws increases, even as the black population decreases relative to the white population.

Table 2 shows the effect of disenfranchisement on turnout and fraction Democratic vote share using the main specification. The election data is averaged over the decade following the census year for consistency across specifications. For turnout, poll taxes or literacy tests reduce presidential turnout by 8-11% and gubernatorial turnout by 23%. This is consistent with other numbers in the literature (as discussed by Kousser 1974). There is a 10-12% negative effect on congressional turnout, but it is less precisely estimated. The next 3 columns of Table 2 show the effect of disenfranchisement on fraction Democratic vote share. There is a 5.8% increase in presidential vote share significant at the 5% level, and a 10% increase in congressional Democratic vote share. While the effects on gubernatorial Democratic votes are similar in magnitude to the presidential elections, they are not significant at 10%. In sum, this Table shows that legal disenfranchisement lowered turnout to the advantage of the Democratic party.

The differences across elections are instructive, although they could be due to changing samples, as some election data is missing from the ICPSR and Hirano-Snyder samples. The largest effect on turnout is in gubernatorial elections, which falls by around 23% in both the balanced and unbalanced samples after the passage of a disenfranchisement law. This is consistent with state level redistribution as the mechanism that is the focus of this paper. Because federal elections were generally between 2 parties, the laws would naturally favor the Democrats when partisan Republicans were disenfranchised, which could explain the significant coefficient on the Democratic vote share in presidential and congressional elections.

Figures 4a and 4b show the results of a dynamic specification on presidential turnout and the fraction voting Democratic in presidential elections. While gubernatorial elections are highly heterogeneous in timing and congressional elections are contaminated by pervasive gerrymandering, presidential elections are both high-frequency and regularly timed. The high frequency

allows inclusion of leads and lags, and the fixed timing eliminates concerns of endogenous election timing. Formally, the points on the graph at time t relative to the passage of a disenfranchisement law is the cumulated sum of the coefficients $\sum_{k=-3}^{k=t} \beta_k$, where the β_k are the coefficients from a regression of the form:

$$\log(y_{p(c)cst}) = \sum_{k=-3}^{3} \beta_k (D^p_{it+k} + D^L_{it+k}) + \sum \beta_t X_{1860} + \delta_c + \delta_{p(c)t} + \epsilon_{cp(c)st}$$

The cumulative effect of disenfranchisement laws on presidential turnout shows no pre-existing trend, but does register a large drop in turnout immediately following the passage of the laws. The effects on Democratic vote share are more mixed, with some evidence of pre-exisiting falls and rises in Democratic vote share. However, it is reassuring that the cumulative effect is not significant until the passage of the law at $t = 0$.

While not reported, I did estimate the effect of disenfranchisement on racial violence. Results using lynchings[14], measured both as a count and a binary variable, give an imprecise (i.e. not significant) but negative coefficient. This 0 effect is consistent with the idea that violence was not an effective substitute for legal disenfranchisement; otherwise lynchings may have fallen substantially. This result is not reported because of difficulties of interpretation; a fall in lynchings post-disenfranchisement could suggest that, since lynchings could be politically motivated, the *de jure* disenfranchisement of blacks made the *de facto* use of violence unnecessary. However there could also be an increase in racist violence following disenfranchisement, as local law enforcement would no longer be under as much political pressure to enforce the rule of law vis-a-bis black citizens. Owing to these contradictory interpretations, this paper does not pursue the analysis of lynchings. Nonetheless, identifying the effect of disenfranchisement from contiguous counties does provide more confidence that voter intimidation and coercion, which are not likely to respect state boundaries, are not confounding the estimates of the impact of the legal changes.

In sum, the results on turnout and voting support the view of more recent Southern historians (e.g. Kousser) rather those of older political historians (exemplified by Key): the formal legal institutions of the South were important for reducing turnout, benefiting the Democrats, and potentially altering the political equilibrium of the South.

[14]The lynchings data is from the Historical American Lynchings project, collapsed to the county-decade level.

7.1 Education

Tables 3A and 3B show results on education, measured as black and white teachers per child and per pupil. As schools were effectively segregated, the number of black teachers is a proxy for black schooling inputs. Column 1 of Table 3A reports the effect of disenfranchisement on the black teacher to eligible student ratio, calculated by taking the average over the state education reports and then averaging that with the calculated census value. The estimated coefficient is -0.0039, which is a large effect, over 50% of the pre-disenfranchisement mean over a decade. The effect is very similar when calculated using the median of the state education reports for teachers and eligible pupils, as reported in column 2. Column 3 reports the effect on median teacher-pupil ratios from the state education reports only, which is reflected in the much smaller sample size. Nonetheless, the effect of disenfranchisement is -0.0016, which is relatively small given the very high pre-disenfranchisement sample mean of 0.05. When combined with the pupils measure calculated from the census, as in column 4, the results are no longer significant at 10%, although they are still negative.

Table 3B reports coefficients for the same specification regressed on white schooling inputs. I find no significant effects, and the point estimates on the teacher-eligible child ratio are very small in magnitude, especially relative to the pre-disenfranchisement sample mean of 0.11. When looking at teacher pupil ratios, however, the results are larger in magnitude and comparable to the estimates for blacks, although they are relative to a higher overall mean and not significant.

The difference between the teacher-child and teacher-pupil ratios may reflect the poorer data quality in the latter, but it may also reflect the endogeneity of pupils. Parents choose to send their children to school in response to quality and the availability of teachers. Thus the larger effects on teacher-pupil ratios may reflect an additional effect of parents withdrawing their children from lower-quality schools. While data availability does not allow me to pursue analysis of other measures of school quality, the evidence in Table 3A and 3B shows that disenfranchisement was associated with lower black educational inputs. While it is difficult to rule out, for example, differential state trends in black schooling, owing to the few states in the sample, the evidence is consistent with the model's predictions: the altered political equilibrium induced by black disenfranchisement lowered public spending on black schools.

7.2 Agricultural Production

Table 4 presents the effects of disenfranchisement on a variety of variables from the agricultural census. Columns 1 and 2 look at the effect on farm values and land values (farm values per

acre), and report that an additional instance of a poll tax or literacy test is associated with a 7% increase in farm and land values. While this may appear large, it should be noted that this is over a decade, so it is a more modest 0.7% per year appreciation in farm and land values. This is virtually identical in the balanced and unbalanced samples. Column 3 estimates the effect on equipment per farm, and while the coefficient is positive, it is insignificant. While there may be some additional incentive to invest in farm capital as a result of lower taxes, its effect is not strong enough to be statistically distinguishable from 0. Column 4 looks at the effect on the number of farms, and finds a 6% increase in the number of farms. This is consistent with an extended version of the model in which the supply of land is endogenous, so that a fall in the tax rate (or cost of labor) induces additional entry into production.

While the model makes no particular prediction about the distribution of land among the landed, one could imagine scale effects of the fall in taxes or labor costs inducing a reallocation of land among producers. However, it appears that there is no effect on the land gini (note that this does not account for landless workers), and the coefficient in column 6 is a small negative. Column 7 estimates the effect on the fraction of farmland that is improved acreage and finds, consistent with investment induced by lower taxation, a positive coefficient, although not statistically significant. Finally, column 8 looks at overall agricultural output, and reports a coefficient on legal disenfranchisement of 0.06, suggesting an increase of 6% per decade in agricultural output, again perhaps due to the additional investment. Taken together, the results from Table 4 suggest a positive effect of disenfranchisement on agricultural outcomes, at least within the contiguous county-pairs.

7.3 Migration

Table 5 looks at the effects of disenfranchisement on population changes, and finds that black population falls relative to the white population. Columns 2, 4, and 6 include a control for the lagged value of total population to account for possible trends in population growth. Columns 1 and 2 examine the effect on the log of the fraction of the population that is black, and consistently reports a point estimate of the effect of a disenfranchisement law of around 0.04, significant at the 10% level. Columns 3-6 show that this is not the result of differential falls in black and white populations, but rather a fall in the level of the black population, and a weaker increase in the level of the white population. The fall in the black population becomes large in column 4 in the balanced sample, when a lag of total population is added. Column 7 confirms that there is no significant effect on total population.

7.4 Robustness

Table 6 shows a number of robustness tests. I focus on 6 core variables that are the focus of the paper: Presidential turnout, Democratic vote share, black and white teachers/child, land values, and fraction black. Panel A interacts the disenfranchisement variable with the lagged log of the black population. The interaction is demeaned to keep the main coefficient comparable with previous specifications. The only significant heterogeneity is on the turnout and fraction Democrat variables, where a larger black population is associated with a larger loss of votes and a larger increase in Democratic vote share following disenfranchisement. Panel B creates homogeneous counties by the 1920 borders instead of the 1870 maps. The effects are qualitatitatively similar, although the land price effect, while still significant at 10%, falls somewhat.

Panel C reports a placebo specification, where I match each county that lies on a state border with its neighboring counties that lie *in the same state*, which I counterfactually assume are not affected by the disenfranchisement laws. I then re-estimate the main specification. If my identifying assumption is correct, then the effect of poll taxes and literacy tests in this regression should be insignificant. As panel C shows, there is no significant effect of disenfranchisement on any of the outcome variables, suggesting that there is not a spurious effect occurring at the state borders.

7.5 Other Specifications and Samples

While I do not report them, I estimate the following specification in Tables 2-6 on the sample of border counties used in the main specification as well as the sample of all counties in the Southern states, omitting the county-pair cross year fixed effect. The results illuminate what sources of variation and mechanisms are driving the results from the main specification presented in the previous sections.

$$y_{cst} = \beta(D^P_{st} + D^L_{st}) + \sum_{t=1870}^{1920} \alpha_t X_{c,1860} + \delta_c + \epsilon_{cst}$$

The effects on political and educational outcome variables from this specification estimated on alternate samples yields results very similar to those in Tables 2 and 3, in both the border county sample and the full set of counties. However, some interesting differences appear when looking at the economic variables. The increase in the land price is constant on the border sample, regardless of the inclusion of fixed effects, but is not present in the full sample of counties. This suggests that there is a high degree of within-state heterogeneity in land responses to disenfranchisement.

However, with the migration response, omitting the county-pair cross year fixed effects changes the results dramatically. While the effect on the relative fraction of the population that is black remains negative, there is now a positive effect on both black and white population levels. We are now comparing every border county to the entire sample of border counties, and so the unobserved labor market and geographic migration patterns are likely to be much more important in this specification.

By just focusing on the border counties, I compare the borders of a disenfranchising state to the borders of the controls. Insofar as these are similar in terms of underlying land quality, coupled with the fact that land values are asset prices set by forward looking agents, it is unsurprising that the county-pair cross year fixed effects do not control for much additional variation. However, because local labor markets are likely to be influenced by transitory shocks, precisely because labor is mobile and adjustable, the inclusion of the county-pair cross year fixed effects controls for substantial amounts of unobserved labor market variation.

7.6 Border Heterogeneity in Transportation Costs

To further examine how the local economy responds to disenfranchisement, I interact the disenfranchisement independent variable with a variety of fixed county-pair characteristics. In particular, I am interested in proxies for market integration or transport costs. I use the distance between the centroids of the two counties in each pair, an indicator for whether or not both counties have a railroad or not in 1880, and the standard deviation of elevation in the county-pair. I estimate the following regression:

$$y_{p(c)cst} = \beta_1(D^P_{st} + D^L_{st}) + \beta_2(D^P_{st} + D^L_{st}) \times (X_{p(c)} - \overline{X}_{p(c)}) + \sum_{t=1870}^{1920} \alpha_t X_{c,1860} + \delta_c + \delta_{p(c)t} + \epsilon_{p(c)cst} \tag{12}$$

where $X_{p(c)}$ denotes the county-pair characteristic being interacted and $\overline{X}_{p(c)}$ denotes its sample average, which I subtract to ensure that β_1 is comparable to the earlier results. For the same reason, I estimate (12) again on the full sample and the balanced sample.

Table 7, panel A shows the results for farm values and fraction black. While the main effect remains unchanged from the analogs in Tables 4 and 5, there is no evidence that any of the pair-level interactions are significant in explaining the effect of disenfranchisement. Since there is no evidence of linear heterogeneity, I can look at subsamples of county pairs to non-parametrically look at heterogeneous effects by pair-distance. Figures 5 and 6 show the effect

of disenfranchisement as the maximum distance between counties in the sample goes from 30 to 110 (the largest distance in the sample). Interestingly, Figure 5 shows that the migration response is larger (although imprecisely estimated) in those county pairs where the centroids are closer. Corresponding to this, as predicted by the model, is that the effect on farm values is *lowest* in the county-pairs where the centroids are closer, perhaps reflecting the additional loss of labor endured by landowners nearer to a state boundary. This suggests that in the subsample of close county-pairs, there may be some spillover migration effect, which accentuates the black outmigration effect and attenuates the farm value effect. As a caveat, however, this could be also driven by other county or county-pair level variables that are correlated with close centroids, such as county size (as two small counties will naturally have close centroids).

Panel B of Table 7 shows county-level interactions. The first set of columns reports interactions with the Mississippi river dummy variable, and finds no heterogeneity in the response of counties that border the Mississippi, perhaps because the identification strategy just compares them to other counties that also border the Mississippi. Again, there is no significant interaction of the disenfranchisement laws with county-level presence of a railroad or the county's standard deviation of elevation.

Table 7 shows that there is little evidence of linear heterogeneity by various proxies for market integration. However, looking non-parametrically at the distance between counties suggests some evidence of general-equilibrium effects in the county-pairs with county centroids that are very close to each other, as one would expect.

8 The Incidence of Disenfranchisement on Land and Labor

In order to apply Propositions 5 and 6 to calculate incidence, I need two auxillary parameters. First I need to benchmark the migration response to income differences between counties, allowing a crude estimate of the income-equivalence of disenfranchisement. Because I do not observe c directly, I need an estimate of the income-migration elasticity for Southern black male migration, which I obtain from regressions using the linked census schedules from 1870-1880. This translates an aggregate migration response into a "money metric" that can then be used to calculate welfare of the potentially migrating populations. To use proposition 5 and obtain the effect on the average landowner I need an estimate of the scale parameter for the tail of the α distribution, which I obtain from the individual farm schedules extracted from the 1880 agricultural census by Ransom and Sutch (2001).

8.1 Estimating Black Income-Migration Elasticities

I use the linked 1870-1880 IPUMS sample for two reasons. First, it is the only 10-year linked census, as the linkage is to the 1880 individual schedules and the 1890 individual schedules have been destroyed (which is why I cannot use these for reliable estimates of the impact of disenfranchisement on migration), and therefore lets me look at the shortest migration window. 1870-1880 is also the beginning of my sample period, and therefore unlikely to be contaminated by the effects of the disenfranchisement laws. I restrict my sample to men aged 16-60, and match them to the agricultural census data for their county of residence in 1870. Sample statistics are in Table 8. Notably, the mean levels of migration are very high, with approximately 40% of men changing counties between 1870 and 1880. Agricultural wages, unfortunately, are not available at the county level in 1880. Therefore, I look at black migration as a function of county growth in agricultural income. I estimate the following model at the individual level:

$$Migrate_i = \beta_0 + \beta_y g_{ya} + \beta_v g_{va} + X_a \beta_a + X_i \beta_i + \epsilon_{ia} \tag{13}$$

Where i denotes individual and a denotes county. $Migrate$ is a dummy indicating that the individual changed counties between 1870 and 1880. g_{ya} is the growth rate in agricultural output in county a, and g_{va} is the growth rate in the land value. By controlling for g_{va} I am adjusting for the share of the agricultural income growth that is going into land values, and thus making g_{ya} a better estimate of the returns to labor. X_a is a vector of county-level covariates (growth of black teachers, and total population), and X_i is a vector of individual covariates (age, age-squared, urban, and literacy). For comparison, I estimate the same regressions for whites and blacks separately. Standard errors are clustered at the county level.

Results are in Table 9. On the full set of Southern blacks, I estimate a β_y of -0.12 without controls, decreasing in magnitude to -0.11 when individual controls are added. A 1% increase in the growth rate of agricultural income is associated with an 11 percentage point increase in the probability of staying in the county. The coefficient on the growth rate of black teachers is also positive and significant at 10% confidence without the individual controls, falling slightly (and becoming marginally insignificant) when controls are added.

When estimated on the sample of border county residents, the migration response to income growth increases by almost a factor of 2. Thus a 1% increase in the growth rate of agricultural income in a border county is associated with a 18 to 22 percentage point fall in the probability of outmigration. This may reflects greater state-level opportunities for residents of border counties. The coefficient on black teacher growth falls substantially in magnitude and becomes insignificant.

The results for whites are included to illustrate that a) whites did not respond nearly as much as blacks to county-level income growth, and b) the summary statistics indicate that while the migration rates for both whites and blacks are high, blacks are on average more likely to migrate than whites. While this could be due to the poor quality of the linkage, owing to black illiteracy and general difficulties with the 1870 census, it could also be evidence that black mobility during the decade following Reconstruction was high in both levels (as seen in the summary statistics) and in its responsiveness to agricultural income.[15]

For my calibration, I need to calculate an elasticity of migration with respect to *black* income, so further assumptions need to be made. I assume that black income grows at the same rate as overall agricultural income, and use the following formula:

$$\frac{\Delta Y^B}{\Delta p} = \frac{\frac{\Delta M^B}{\Delta p}}{\frac{\Delta M^B}{\Delta Y^B}} = \frac{\frac{\Delta M^B}{\Delta p}}{\frac{\Delta M^B}{\frac{\Delta Y}{Y}} \frac{\frac{\Delta Y^B}{Y^B}}{\Delta Y^B}} = \frac{\frac{\frac{\Delta M^B}{M^B} \times M^B}{\Delta p}}{\frac{\Delta M^B}{\frac{\Delta Y^B}{Y^B}} \frac{1}{Y^B}} \tag{14}$$

I then use Higgs' estimate of black income in 1867-68 of $Y^B = \$50$, the coefficient β_y from the black border sample estimated above in this section, the coefficient of a disenfranchisement law on log black population (-0.0289), and finally total black population (4.5 million), to plug these numbers into (14) to get a conservative estimate of:

$$\frac{.0289 \times 4500000}{-0.22 \times \frac{1}{50}} = -30,000,000$$

Alternately this can be expressed as a -13% fall in black income. If I instead take the fraction black population estimates (which effectively assumes that whites are the control group), and assume that the coefficient on agricultural income on all (border and non-border) black migration is the correct one:

$$\frac{.045 \times 4500000}{-0.11 \times \frac{1}{50}} = -92,045,455$$

The historical price conversion calculator at `eh.net` suggests a conversion rate of 20 in purchasing power terms from 1880 to 2000. Therefore, a lower bound on estimated loss of black income from disenfranchisement is between 600 million and 2 billion current-day dollars. The estimate is likely to be conservative, firstly as the income-migration elasticity is calculated from a period (1870-1880) and a population (residents of border counties) where it is likely to be very high. Secondly proposition 6 tells us that there is a mass of disenfranchisement citizens that

[15] While not a focus of this paper, estimating post-bellum black mobility in both levels and responsiveness to income differences using the IPUMS linked censuses (from 1860 to 1930) is a promising area for future research.

lose access to local public goods but do not migrate; and their welfare does not show up in the estimates from this section.

8.2 Tail Parameter for α

Second, to obtain an estimate for the welfare gains of landowners, I need to obtain an estimate of the shape parameter of the distribution of α to use Proposition 5. I use the Ransom and Sutch farm sample from the 1880 agricultural census to estimate the shape parameter of the distribution of α, under the assumption that the distribution of α will be close to the distribution of capital stocks across farms.

Figure 7 plots the log of the rank of a farm's equipment stock against the log of the equipment stock. The linearity of the resulting graph corroborates the Proposition 6 assumption that the distribution has a Pareto tail. Using the Gabaix and Ibragimov (2009) estimator, which regresses the log of the capital stock rank of a farm minus $\frac{1}{2}$ on the log of the capital, gives a Pareto shape coefficient of $b = 2.33$. Aggregate land value in the U.S. South in 1880 is 1.5 billion, which implies an aggregate increase in landowner wealth of $\frac{1}{2.33-1} \times 0.07 \times 1500 = 78.9$ million. To convert this stock into a flow requires an assumption about the discount rate, which at 5% per year becomes 62% per decade, which implies a flow increase of $(1-0.62) \times 78.9 = 29.9$ million dollars in landlord income. Transforming this into current day dollars would yield an equivalent transfer of roughly 600 million dollars. Again, this estimate is likely to be conservative, as it is obtained from land sitting on state borders, which is also likeliest to capitalize a higher wage-bill owing to out-migration of black labor.

These calculations imply that the benefits to poor whites could not have been substantial, since landowners pocketed the bulk of the implied black loss. Together with no evidence of improved white schooling or large and significant white in-migration to disenfranchised counties, this suggests that poor whites were not the primary beneficiaries of disenfranchisement.

9 Conclusion

This paper has estimated the impacts of Southern disenfranchisement on political competition, public good provision, land values, and migration using contiguous cross-state county pairs. I find that poll taxes and literacy tests lowered turnout, increased Democratic vote shares, and lowered black school quality. I also find that land and labor markets respond to the fall in redistribution, resulting in higher land prices and increased black out-migration. The resulting estimates are informative about core questions in political economy, particularly those around

the incidence of disenfranchisement on factor owners. By looking at land prices and migration decisions in these small open economies, I am able to infer the welfare implications of franchise restriction across groups, and find that the bulk of black losses were transferred to landowners.

While this paper has not directly estimated long-run impacts of Southern disenfranchisement, it is likely that the effects of black political exclusion and educational under-provision persist through the intergenerational transmission of human capital and wealth (Sacerdote 2005). Besides the effects on national racial inequality and skewed public-goods provision in the region, the "Solid South" engendered by formal disenfranchisement shaped the political and economic landscape of the United States for much of the 20th century, impeding welfare state expansion during the New Deal and later serving as a regional haven for low-wage manufacturing (Alston and Ferrie 1999, Cobb 1982, Holmes 1998).

The results in this paper suggest that, consistent with a large body of formal theory and historical evidence, restricting the franchise lowers redistribution and public good provision. When occurring at the decentralized level, as in the U.S. South, these effects are capitalized into land values and migration decisions. This paper suggests that the landowners of the U.S. South benefited from franchise restriction, so much so that it outweighed the ensuing loss of black labor. Historically, large landowners are often the social group most opposed to democratization around the world, and the U.S. was no exception. The denial of effective political participation to minority groups persists in many developing countries today, albeit rarely enshrined in formal laws as in the U.S. South. Understanding how economic institutions adapt to and constrain these particular variants of nondemocracy is a promising area for future research.

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Appendix A: Proofs

Proof of Proposition 3:

Establishing a) follows straightforwardly from noting that the pre-disenfranchisement wage is given by:

$$Lk = F(\frac{w+c}{m}) - \frac{1}{2} + F(\frac{w}{m}) \tag{15}$$

and the post-disenfranchisement wage is given by:

$$Lk = F(\frac{w'+c}{m}) \tag{16}$$

So (15) and (16) imply that:

$$F(\frac{w'+c}{m}) = Lk > Lk + \frac{1}{2} - F(\frac{w}{m}) = F(\frac{w+c}{m}) \tag{17}$$

Since F is monotonic, it follows that $w' > w$.

To see b), write:

$$\Delta v = (-\Delta\tau)F^{-1}(1-L) - k\Delta w = \frac{c}{R}\alpha^*(p' - \frac{1}{2}) - k(w' - w)$$

If $k\Delta w > 0$ is sufficiently large, then Δv could be negative, which implies that the land price falls following disenfranchisement.

Proof of Proposition 4:

First I establish that blacks, whites with $\alpha < \alpha^*$ and whites with $\alpha > \alpha^*$ each have ideal e being 0, $\overline{e}$, and e^*, respectively. For whites with $\alpha < \alpha^*$, consumption is weakly increasing in w, so the preferred policy for poor whites is $e = \overline{e}$.

For whites with $\alpha \geq \alpha^*$, the ideal e solves:

$$\min_e w(e)(1-\theta^B)(F^W(\frac{w(e)+c}{m}) - (p' - F^W(\frac{w(e)}{m}))) + (w(e)-e)\theta^B(F^B(\frac{w(e)-e+c}{m}) - (p' - F^W(\frac{w(e)}{m}))) \tag{18}$$

Which is just $e^* < \overline{e}$. For blacks with $\alpha < \alpha^*$, which is all of them by assumption, the ideal e is 0.

If $e = \overline{e}$ then land prices go up if the retained income minus the wage bill is greater after disenfranchisement, rather than before. Since the total labor supply equals labor demand, which is fixed at Lk, for the overall wage bill to fall it is sufficient to show that:

$$w \geq w'(\overline{e}) - \overline{e}\theta^B(F^B(\frac{w'(\overline{e}) - \overline{e} + c}{m}) + F^B(\frac{w'(\overline{e}) - \overline{e}}{m}) - p') \tag{19}$$

Looking at a first-order Taylor approximation to $w'(\overline{e})$ around 0, I can write:

$$-\frac{dw'(0)}{de}\overline{e} > -\overline{e}\theta^B(F^B(\frac{w'(\overline{e})-\overline{e}+c}{m}) + F^B(\frac{w'(\overline{e})-\overline{e}}{m}) - p') \tag{20}$$

or

$$\frac{dw'(0)}{de} < \theta^B(F^B(\frac{w'(\overline{e})-\overline{e}+c}{m}) + F^B(\frac{w'(\overline{e})-\overline{e}}{m}) - p') \tag{21}$$

Now note that:

$$\frac{dw'(0)}{de} = \theta^B \frac{f^B(\frac{w+c}{m}) + f^B(\frac{w}{m})}{\theta^B(f^B(\frac{w+c}{m}) + f^B(\frac{w}{m})) + (1-\theta^B)(f^W(\frac{w+c}{m}) + f^W(\frac{w}{m}))} \tag{22}$$

Thus, condition (21) is equivalent to:

$$w'(0)\frac{\theta^B(f^B(\frac{w+c}{m}) + f^B(\frac{w}{m}))}{\theta^B(F^B(\frac{w'(\overline{e})-\overline{e}+c}{m}) + F^B(\frac{w'(\overline{e})-\overline{e}}{m}) - p')} < w'(0)(\theta^B(f^B(\frac{w+c}{m})+f^B(\frac{w}{m}))+(1-\theta^B)(f^W(\frac{w+c}{m})+f^W(\frac{w}{m})))$$

And the left-hand side of this equation is the labor-supply elasticity of black labor, so if it is sufficiently low, wages will fall, and land values will rise if e goes from 0 to $\overline{e}$. Thus, agents with $\alpha > \alpha^*$ will prefer e^* to $\overline{e}$, and, if they are white, they will prefer $\overline{e}$ to $e = 0$. Since blacks have lower α than whites, agents political preferences can be ordered by α, thus ensuring that a median voter exists[16].

Since $\theta^B > \frac{1}{2}$ the median voter pre-disenfranchisement is black, and therefore $e = 0$ is the chosen policy. Since $p' > \theta^B$ and $\inf F^{B-1}(1) < \sup F^{W-1}(0)$, all blacks are disenfranchised. Since $p' < 1 - L$ the new median voter is a non-producing white, so that the post-disenfranchisement equilibrium now features $e = \overline{e}$.

Proof of Proposition 5:

Differentiating (5) it can be seen that a small change in p, the decisive percentile, yields:

$$-\frac{d\tau(p)}{dp}\alpha^* - k\frac{dw}{dp} = \frac{dv}{dp} \tag{23}$$

By decreasing the tax rate (and possibly the wage), disenfranchisement increases the price of land, just enough to make the marginal producer indifferent. Thus the land price change captures the welfare change for the marginal producer. To convert this into the effect on the average welfare of all producers, I integrate over the conditional distribution of α

[16] A simple ordering ranks the pairs (τ, e) as follows: $(\tau, e) \preceq (\tau', e') \iff \tau \geq \tau'$ and $w(e) - e\theta^B(F^B(\frac{w+c-e}{m}) - F^B(min(\alpha_{p'}, \frac{w-e}{m})) - F^B(\frac{w-e}{m})) \geq w(e') - e'\theta^B(F^B(\frac{w+c-e'}{m}) - F^B(min(\alpha_{p'}, \frac{w-e'}{m})) - F^B(\frac{w-e'}{m}))$. Since agents with higher α like lower taxes and (weakly) a lower wage bill (this comes from the fact that the low black labor supply elasticity implies that the overall wage bill is reduced when non-producing whites choose a high degree of black wage repression), we have that preferences satisfy single crossing.

$$\frac{dW^L}{dp} = \int_{\alpha^*}^{\infty} -\frac{d\tau(p)}{dp}\alpha - \frac{dv}{dp} - k\frac{dw}{dp}dF(\alpha) = (1-F(\alpha^*))(-\frac{d\tau(p)}{dp}E[\alpha|\alpha>\alpha^*] - k\frac{dw}{dp} - \frac{dv}{dp})$$

Suppose F is a Pareto distribution with shape parameter $b>1$ and scale parameter $a<\alpha^*$, then the conditional mean $E[\alpha|\alpha>\alpha^*] = \frac{b\alpha^*}{b-1}$ [17]

Therefore, using (23) the average change in producer welfare is given by:

$$(-\frac{d\tau(p)}{dp}E[\alpha|\alpha>\alpha^*] - k\frac{dw}{dp} - \frac{dv}{dp}) = (\frac{dv}{dp} + k\frac{dw}{dp})\frac{E[\alpha|\alpha>\alpha^*]}{\alpha^*} - k\frac{dw}{dp} - \frac{dv}{dp} = (\frac{dv}{dp} + k\frac{dw}{dp})\frac{1}{b-1}$$

If wages are fixed exogenously, so $\frac{dw}{dp} = 0$, then change in producer welfare is:

$$\frac{1}{b-1}\frac{dv}{dp}$$

which establishes the result.

Proof of Proposition 6:

This establishes the result for B. A similar derivation obtains the result for PW. First write:

$$\Delta W^B = \int_{\alpha_{p'}}^{\alpha^*} \max(w+c, \alpha m)dF^B(\alpha) + \int_0^{\alpha_{p'}} \max(w, \alpha m)dF^B(\alpha) \quad (24)$$

$$- \int_{\alpha_{med}}^{\alpha^*} \max(w+c, \alpha m)dF^B(\alpha) - \int_0^{\alpha_{med}} \max(w, \alpha m)dF^B(\alpha) \quad (25)$$

Which immediately implies:

$$\Delta W^B = \int_{\alpha_{med}}^{\alpha_{p'}} max(w, \alpha m) - \max(w+c, \alpha m)dF^B(\alpha) \quad (26)$$

Invoking the mean value theorem for integrals gives us that an $\alpha'' \in [\frac{w+c}{m}, \frac{w}{m}]$ exists such that:

$$\Delta W^B = (m\alpha'' - w - c)(F^B(\alpha_{p'}) - F^B(\frac{w}{m})) - c(F^B(\frac{w}{m}) - F^B(\alpha_{med}))$$

So it can be seen that:

$$\Delta W^B < -c(F^B(\alpha_{p'}) - F^B(\frac{w}{m})) = -c\Delta M^B$$

[17] The cdf of the Pareto distribution is $G(\alpha) = 1 - (\frac{a}{\alpha})^b$, so the pdf of the truncated Pareto distribution is $g(\alpha|\alpha>\alpha^*) = \frac{b\frac{a^b}{\alpha^{b+1}}}{(\frac{a}{\alpha^*})^b} = \frac{b(\alpha^*)^b}{\alpha^{b+1}}$. Integrating $\int_{\alpha^*}^{\infty} \frac{b(\alpha^*)^b}{\alpha^b}d\alpha$ gives $\frac{ba^b\alpha^{*1-b}}{b-1}$. Dividing this by $1-G(\alpha^*) = (\frac{a}{\alpha^*})^b$ yields the conditional expectation $E[\alpha|\alpha>\alpha^*] = \frac{b\alpha^*}{b-1}$.

Table 1: Summary Statistics

Variable	Neither Poll Tax nor Literacy Test			Either Poll Tax or Literacy Test			Both Poll Tax and Literacy Test		
	Obs	Mean	Std. Dev	Obs	Mean	Std. Dev	Obs	Mean	Std. Dev
Log (Presidential Votes Cast)	1916	7.53	0.68	983	7.35	0.79	927	7.02	0.70
Log (Congressional Votes Cast)	1880	7.30	0.72	875	7.13	0.79	845	6.60	0.81
Log (Gubernatorial Votes Cast)	1911	6.52	0.63	977	6.32	0.71	843	5.68	0.78
Log(Percent Presidential Vote Democrat)	1916	3.99	0.41	983	4.02	0.40	927	4.34	0.24
Log(Percent Congressional Vote Democrat)	1880	4.09	0.37	875	4.12	0.56	845	4.48	0.25
Log(Percent Gubernatorial Vote Democrat)	1908	4.01	0.41	977	4.07	0.40	843	4.48	0.21
Black Teachers / Black Children (Census and State Report Average)	1895	0.006	0.012	975	0.011	0.034	916	0.009	0.016
Black Teachers / Black Children (Census and State Report Median)	1895	0.006	0.012	975	0.011	0.034	916	0.008	0.015
Black Teachers / Black Pupil (State Report Median)	763	0.052	0.758	438	0.020	0.010	766	0.021	0.012
Black Teachers / Black Pupil (Census and State Report Median)	1548	0.025	0.127	952	0.021	0.062	922	0.015	0.018
White Teachers / White Children (Census and State Report Average)	1915	0.011	0.014	983	0.015	0.016	927	0.019	0.018
White Teachers / White Children (Census and State Report Median)	1915	0.011	0.014	983	0.015	0.016	927	0.019	0.018
White Teachers / White Pupil (State Report Median)	783	0.030	0.013	445	0.029	0.011	723	0.038	0.059
White Teachers / White Pupil (Census and State Report Median)	1820	0.035	0.098	983	0.026	0.036	923	0.028	0.024
Log(Farm Value)	1918	14.00	0.96	983	14.32	1.17	927	14.93	0.93
Log(Farm Value/ Acre)	1900	1.86	0.73	980	2.46	1.07	927	2.99	0.76
Log (Equipment Value/ Farm)	1915	3.74	0.69	983	4.22	0.78	927	4.53	0.61
Log(Number of Farms)	1918	7.18	0.77	983	7.26	0.76	927	7.69	0.74
Land Gini	1918	0.55	0.08	983	0.49	0.07	927	0.48	0.08
Fraction Improved Land	1918	0.36	0.15	983	0.43	0.16	927	0.45	0.14
Log(Agricultural Output)	1918	13.33	0.89	983	13.68	1.11	927	14.38	0.93
Log(Fraction Black)	1918	-1.51	1.08	983	-1.66	1.25	925	-1.24	1.04
Log(Black Pop)	1918	8.00	1.42	983	7.92	1.52	925	8.65	1.29
Log(White Pop)	1918	8.98	0.70	983	9.11	0.69	927	9.22	0.72
Log(Pop)	1918	9.51	0.63	983	9.58	0.64	927	9.89	0.54

Table 2:Effect of Disenfranchisement on Turnout and Political Competition

	Log(Total Votes Cast)			Log(Fraction Democrat)		
Panel A: Full Sample	(1)	(2)	(3)	(4)	(5)	(6)
	Presidential	Congress	Governor	Presidential	Congress	Governor
Poll Tax + Literacy Test	-0.108**	-0.122*	-0.231***	0.0579**	0.102**	0.0578
	(0.0486)	(0.0645)	(0.0777)	(0.0246)	(0.0403)	(0.0378)
Sample Counties	Border	Border	Border	Border	Border	Border
Years	Census	Census	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y
N	3826	3582	3728	3826	3582	3725
Panel B: Balanced Sample	(1)	(2)	(3)	(4)	(5)	(6)
	Presidential	Congress	Governor	Presidential	Congress	Governor
Poll Tax + Literacy Test	-0.142***	-0.109*	-0.225***	0.0579**	0.0994**	0.0553
	(0.0435)	(0.0607)	(0.0808)	(0.0227)	(0.0412)	(0.0378)
Sample Counties	Border	Border	Border	Border	Border	Border
Years	Census	Census	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y
N	3648	3405	3565	3648	3405	3562

Notes: Standard errors multi-dimensionally clustered on border-segment X year and state. 1860 controls are year specific effects of log 1860 fraction slave, log 1860 population, and log 1860 urban population. Balanced sample is the set of counties that have the core variables nonmissing for both themselves and their matched county.

Table 3A: Effect of Disenfranchisement on Black Teachers

Panel A: Full Sample	(1) Teacher/Child (SR and Census)	(2) Teacher/Child (MSR and Census)	(3) Teacher/Pupil (MSR)	(4) Teacher/Pupil (MSR and Census)
Poll Tax + Literacy Test	-0.00394*	-0.00394*	-0.00161*	-0.00922
	(0.00228)	(0.00220)	(0.000903)	(0.00571)
Sample Counties	Border	Border	Border	Border
Years	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y
County FE	Y	Y	Y	Y
N	3786	3786	1967	3422

Panel B: Balanced Sample	(1) Teacher/Child (SR and Census)	(2) Teacher/Child (MSR and Census)	(3) Teacher/Pupil (MSR)	(4) Teacher/Pupil (MSR and Census)
Poll Tax + Literacy Test	-0.00394*	-0.00395*	-0.00166*	-0.00928
	(0.00228)	(0.00220)	(0.000904)	(0.00574)
Sample Counties	Border	Border	Border	Border
Years	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y
County FE	Y	Y	Y	Y
N	3740	3740	1941	3381

Notes: Standard errors multi-dimensionally clustered on border-segment X year and state. 1860 controls are year specific effects of log 1860 fraction slave, log 1860 population, and log 1860 urban population. SR refers to the average of the state education reports available for that decade; MSR refers to the median of the state education reports in that decade. SR and Census averages the mean state education report values with the values calculated from the IPUMS. MSR and census averages the median state education report value with the values calculated from the IPUMS. Balanced sample is the set of counties that have the core variables nonmissing for both themselves and their matched county.

Table 3B: Effect of Disenfranchisement on White Teachers

Panel A: Full Sample	(1) Teacher/Child (SR and Census)	(2) Teacher/Child (MSR and Census)	(3) Teacher/Pupil (MSR)	(4) Teacher/Pupil (MSR and Census)
Poll Tax + Literacy Test	-0.000752	-0.000808	-0.00148	-0.00650
	(0.00135)	(0.00137)	(0.00172)	(0.00439)
Sample Counties	Border	Border	Border	Border
Years	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y
County FE	Y	Y	Y	Y
N	3825	3825	1951	3726
Panel B: Balanced Sample	**(1) Teacher/Child (SR and Census)**	**(2) Teacher/Child (MSR and Census)**	**(3) Teacher/Pupil (MSR)**	**(4) Teacher/Pupil (MSR and Census)**
Poll Tax + Literacy Test	-0.000734	-0.000790	-0.00120	-0.00661
	(0.00135)	(0.00137)	(0.00180)	(0.00441)
Sample Counties	Border	Border	Border	Border
Years	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y
County FE	Y	Y	Y	Y
N	3740	3740	1908	3646

Notes: Standard errors multi-dimensionally clustered on border-segment X year and state. 1860 controls are year specific effects of log 1860 fraction slave, log 1860 population, and log 1860 urban population. SR refers to the average of the state education reports available for that decade; MSR refers to the median of the state education reports in that decade. SR and Census averages the mean state education report values with the values calculated from the IPUMS. MSR and census averages the median state education report value with the values calculated from the IPUMS. Balanced sample is the set of counties that have the core variables nonmissing for both themselves and their matched county.

Table 4: Effect of Disenfranchisement on Agricultural Production

Panel A: Full Sample	(1) Log(Farm Value)	(2) Log(Value/Acre)	(3) Log(Equip Value)	(4) Log(Farms)	(5) Land Gini	(6) Fraction Imp	(7) Log(Farm Output)
Poll Tax + Literacy Test	0.0707**	0.0727**	0.0134	0.0640**	-0.00370	0.00790	0.0676**
	(0.0327)	(0.0308)	(0.0401)	(0.0322)	(0.00384)	(0.00531)	(0.0291)
Sample Counties	Border	Border	Border	Border	Border	Border	Border
Years	Census	Census	Census	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y	Y
N	3828	3807	3825	3828	3828	3828	3828

Panel B: Balanced Sample	(1) Log(Farm Value)	(2) Log(Value/Acre)	(3) Log(Equip Value)	(4) Log(Farms)	(5) Land Gini	(6) Fraction Imp	(7) Log(Farm Output)
Poll Tax + Literacy Test	0.0684**	0.0697**	0.00812	0.0664**	-0.00452	0.00835	0.0634**
	(0.0336)	(0.0311)	(0.0415)	(0.0324)	(0.00357)	(0.00513)	(0.0293)
Sample Counties	Border	Border	Border	Border	Border	Border	Border
Years	Census	Census	Census	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y	Y
N	3638	3638	3635	3638	3638	3638	3638

Notes: Standard errors multi-dimensionally clustered on border-segment X year and state. 1860 controls are year specific effects of log 1860 fraction slave, log 1860 population, and log 1860 urban population. Balanced sample is the set of counties that have the core variables nonmissing for both themselves and their matched county.

Table 5: Effect of Disenfranchisement on Black and White Population

Panel A: Full Sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Log(Fraction Black)		Log(Black Pop)		Log(White Pop)		Log(Pop)
Poll Tax + Literacy Test	-0.0436*	-0.0448*	-0.0244	-0.0289	0.0261	0.0235	0.0149
	(0.0256)	(0.0233)	(0.0377)	(0.0278)	(0.0199)	(0.0180)	(0.0212)
Log Pop(t-10)		0.246***		0.994***		0.681***	
		(0.0740)		(0.100)		(0.0548)	
Sample Counties	Border	Border	Border	Border	Border	Border	Border
Years	Census	Census	Census	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y	Y
N	3826	3826	3826	3826	3828	3828	3828

Panel B: Balanced Sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Log(Fraction Black)		Log(Black Pop)		Log(White Pop)		Log(Pop)
Poll Tax + Literacy Test	-0.0395*	-0.0374*	-0.0189	-0.0753**	0.0273	-0.0296	0.0178
	(0.0219)	(0.0219)	(0.0355)	(0.0362)	(0.0187)	(0.0268)	(0.0196)
Log Pop(t-10)		0.120**		0.486***		0.313***	
		(0.0503)		(0.0905)		(0.0517)	
Sample Counties	Border	Border	Border	Border	Border	Border	Border
Years	Census	Census	Census	Census	Census	Census	Census
1860 Controls	Y	Y	Y	Y	Y	Y	Y
Pair-Year FE	Y	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y	Y
N	3638	3638	3638	3638	3638	3638	3638

Notes: Standard errors multi-dimensionally clustered on border-segment X year and state. 1860 controls are year specific effects of log 1860 fraction slave, log 1860 population, and log 1860 urban population. Balanced sample is the set of counties that have the core variables nonmissing for both themselves and their matched county.

Table 6: Robustness of Main Effects

	Political Variables		Education Variables		Factor Markets	
Panel A: Lagged Black Population Interactions						
	(1) Log(Presidential Turnout)	(2) Log(Fraction Democrat)	(3) Black Teacher Child Ratio	(4) White Teacher Child Ratio	(5) Log(Value/Acre)	(6) Log(Fraction Black)
Poll Tax + Literacy Test	-0.0954**	0.0454**	-0.00635*	-0.000780	0.0582*	-0.0516**
	(0.0416)	(0.0190)	(0.00350)	(0.00130)	(0.0307)	(0.0204)
(Poll Tax + Literacy Test) X Log Black Population(t-10)	-0.0388**	0.0331***	0.00279	0.000229	0.0107	0.0172
	(0.0192)	(0.00973)	(0.00171)	(0.000560)	(0.0201)	(0.0120)
Log Black Population(t-10)	0.378***	-0.0114	-0.00303	0.00218*	0.179***	0.203***
	(0.0452)	(0.0231)	(0.00258)	(0.00117)	(0.0397)	(0.0465)
N	3704	3704	3704	3704	3687	3704
Panel B: 1920 County Boundaries						
	(1) Log(Presidential Turnout)	(2) Log(Fraction Democrat)	(3) Black Teacher Child Ratio	(4) White Teacher Child Ratio	(5) Log(Value/Acre)	(6) Log(Fraction Black)
Poll Tax + Literacy Test	-0.154***	0.0619**	-0.00139*	-0.00217	0.0524*	-0.0605**
	(0.0448)	(0.0265)	(0.000769)	(0.00177)	(0.0282)	(0.0290)
N	4000	4000	3929	3999	3989	4000
Panel C: Interior County Placebo						
	(1) Log(Presidential Turnout)	(2) Log(Fraction Democrat)	(3) Black Teacher Child Ratio	(4) White Teacher Child Ratio	(5) Log(Value/Acre)	(6) Log(Fraction Black)
Poll Tax + Literacy Test	-0.0242	0.0176	-0.000452	0.0000418	0.0115	-0.00188
	(0.0170)	(0.0133)	(0.00163)	(0.000882)	(0.0180)	(0.0163)
N	6391	6391	6391	6391	6391	6391

Notes: Standard errors multi-dimensionally clustered on border-segment X year and state. 1860 controls are year specific effects of log 1860 fraction slave, log 1860 population, and log 1860 urban population. Panel A interacts the disenfranchisement variable with the lagged log of the black population. Panel B uses the 1920 county borders to match county-pairs instead of 1870. Panel C is an interior county placebo, which matches border counties to the adjacent counties in the same state and estimates the main specification.

Table 7: Heterogeneity by Transportation Cost Measures

6A: Heterogeneity by Pair Characteristics

	Full (1)	Balance (2)	Full (3)	Balance (4)
	Log(Value/Acre)		Log(Fraction Black)	
Poll Tax + Literacy Test	0.0701**	0.0647**	-0.0447*	-0.0430*
	(0.0301)	(0.0306)	(0.0259)	(0.0224)
Poll Tax + Literacy Test X Pair Centroid Distance	-0.000831	-0.000750	0.000416	0.000297
	(0.00153)	(0.00155)	(0.00112)	(0.00101)
N	3807	3723	3826	3740

	Full (1)	Balance (2)	Full (3)	Balance (4)
	Log(Value/Acre)		Log(Fraction Black)	
Poll Tax + Literacy Test	0.0703**	0.0645**	-0.0438*	-0.0425**
	(0.0302)	(0.0304)	(0.0245)	(0.0215)
Poll Tax + Literacy Test X Pair Railroad	0.0636	0.0679	0.0315	0.0267
	(0.0462)	(0.0467)	(0.0382)	(0.0327)
N	3807	3723	3826	3740

	Full (1)	Balance (2)	Full (3)	Balance (4)
	Log(Value/Acre)		Log(Fraction Black)	
Poll Tax + Literacy Test	0.0705**	0.0653**	-0.0365*	-0.0390**
	(0.0318)	(0.0321)	(0.0194)	(0.0179)
Poll Tax + Literacy Test X Pair Ruggedness	0.000115	0.0000890	-0.000362	-0.000406
	(0.000257)	(0.000263)	(0.000366)	(0.000363)
N	3686	3606	3694	3616

6B: Heterogeneity by County Characteristics

	Full (1)	Balance (2)	Full (3)	Balance (4)
	Log(Value/Acre)		Log(Fraction Black)	
Poll Tax + Literacy Test	0.0731**	0.0684**	-0.0400*	-0.0388*
	(0.0293)	(0.0298)	(0.0230)	(0.0201)
Poll Tax + Literacy Test X Mississippi	0.0428	0.0511	0.0481	0.0443
	(0.0635)	(0.0642)	(0.0448)	(0.0427)
N	3807	3723	3826	3740

	Full (1)	Balance (2)	Full (3)	Balance (4)
	Log(Value/Acre)		Log(Fraction Black)	
Poll Tax + Literacy Test	0.0700**	0.0644**	-0.0434*	-0.0423**
	(0.0312)	(0.0315)	(0.0243)	(0.0213)
Poll Tax + Literacy Test X County Railroad	0.0122	0.00929	0.0162	0.00701
	(0.0318)	(0.0311)	(0.0235)	(0.0219)
N	3807	3723	3826	3740

	Full (1)	Balance (2)	Full (3)	Balance (4)
	Log(Value/Acre)		Log(Fraction Black)	
Poll Tax + Literacy Test	0.0704**	0.0656**	-0.0381*	-0.0405**
	(0.0309)	(0.0314)	(0.0212)	(0.0194)
Poll Tax + Literacy Test X County Ruggedness	0.000449	0.000419	-0.000234	-0.000388
	(0.000348)	(0.000351)	(0.000451)	(0.000430)
N	3741	3661	3760	3678

Notes: Standard errors multi-dimensionally clustered on border-segment X year and state. All specifications include county fixed effects, countypair X year fixed effects, and 1860 controls, which are year specific effects of log 1860 fraction slave, log 1860 population, and log 1860 urban population. All interactions are demeaned. Balanced sample is the set of counties that have the core variables nonmissing for both themselves and their matched county.

Table 8: Linked 1870-1880 Individual Summary Statistics

Panel A: Full Sample

	White			Black		
Variable	Obs	Mean	Std.	Obs	Mean	Std.
Migrate Between 1870-1800 Dummy	21396	0.37	0.48	18095	0.43	0.49
% Change County Agricultural Output	21396	-0.17	0.46	18095	-0.21	0.41
% Change County Black Teachers	21396	0.74	1.47	18095	1.00	1.64
% Change County Land Values	21396	0.28	0.58	18095	0.16	0.52
% Change County Population	21396	0.27	0.22	18095	0.22	0.18
Age	21396	16.53	14.17	18095	15.80	14.18
Age-squared	21396	474.12	631.50	18095	450.64	626.37
Urban	21396	0.10	0.30	18095	0.07	0.26
Literate	21396	0.53	0.50	18095	0.12	0.33

Panel B: Border County Sample

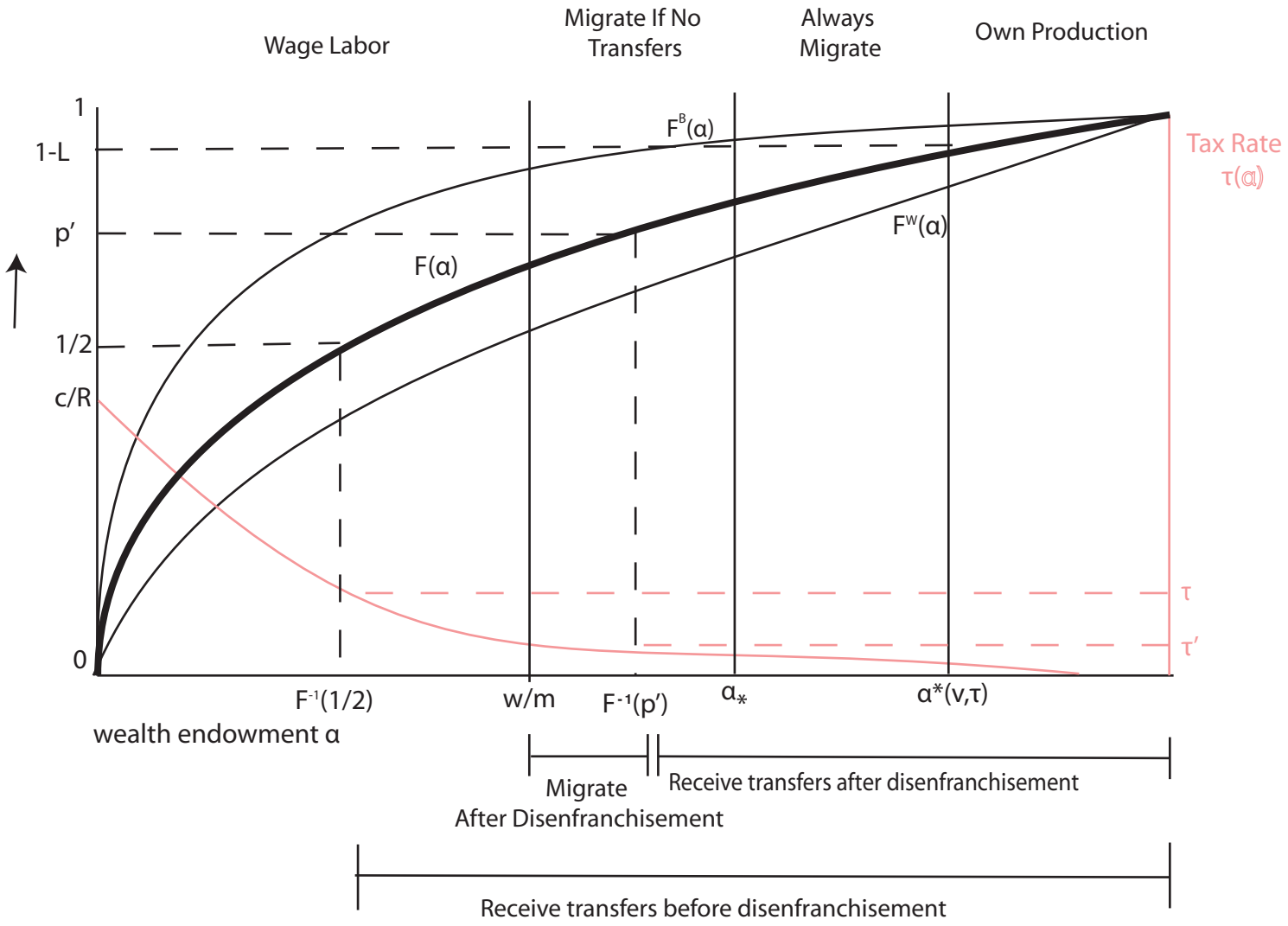
	White			Black		
Variable	Obs	Mean	Std.	Obs	Mean	Std.
Migrate Between 1870-1800 Dummy	2415	0.38	0.49	1895	0.44	0.50
% Change County Agricultural Output	2415	-0.15	0.41	1895	-0.16	0.42
% Change County Black Teachers	2415	0.89	1.40	1895	1.12	1.50
% Change County Land Values	2415	0.37	0.54	1895	0.24	0.56
% Change County Population	2415	0.28	0.16	1895	0.26	0.16
Age	2415	16.38	14.00	1895	15.76	14.17
Age-squared	2415	464.00	620.00	1895	449.07	622.70
Urban	2415	0.05	0.22	1895	0.06	0.24
Literate	2415	0.50	0.50	1895	0.11	0.31

Table 9: 1870-1880 Migration-Income Results From Individual Data

	Dependent Variable is County 1870-1880 Out-Migration Dummy							
	Blacks				Whites			
	All South		Border Counties		All South		Border Counties	
% Change County Agricultural Output	-0.124*	-0.111*	-0.184**	-0.224**	0.0369	0.0337	0.0857	0.0732
	(0.0693)	(0.0571)	(0.0817)	(0.0889)	(0.0460)	(0.0406)	(0.0916)	(0.0854)
% Change County Black Teachers	-0.0142*	-0.0129	0.00577	0.00864	0.00406	0.00418	-0.0127	-0.00694
	(0.00858)	(0.00802)	(0.0200)	(0.0202)	(0.0104)	(0.00948)	(0.0283)	(0.0251)
% Change County Land Values	-0.0119	-0.00987	-0.114*	-0.0904	-0.0323	-0.0294	-0.0381	-0.0289
	(0.0315)	(0.0307)	(0.0659)	(0.0724)	(0.0419)	(0.0362)	(0.0695)	(0.0703)
% Change County Population	0.0355	0.0159	0.162	0.226	0.0292	-0.00543	-0.439**	-0.436**
	(0.113)	(0.106)	(0.243)	(0.248)	(0.181)	(0.151)	(0.210)	(0.207)
Age		-0.0133***		-0.0137***		-0.0147***		-0.0160**
		(0.00329)		(0.00512)		(0.00373)		(0.00719)
Age-squared		0.000238***		0.000269***		0.000248***		0.000290**
		(0.0000574)		(0.0000956)		(0.0000646)		(0.000122)
Urban		-0.0313		0.222**		-0.0398		-0.0143
		(0.0483)		(0.100)		(0.0589)		(0.109)
Literate		0.0226		-0.0422		0.00372		-0.0524
		(0.0228)		(0.0547)		(0.0180)		(0.0463)
N	18095	18095	1895	1895	21396	21396	2415	2415

Standard errors are clustered at the county level. Data is individual level data from the linked IPUMS census schedules from 1870-1880.

Figure 1: Effects of Disenfranchisement



Disenfranchisement raises the decisive percentile of α from 1/2 to p′.
This lowers the political choice of the tax rate from τ to τ′
$F(\alpha^*(v',\tau'))=1-L=F(\alpha^*(v,\tau))$ implies that $v'>v$
Transfers to agents below p′ and greater than 1/2 are eliminated.
Any agents who lose transfers and have $\alpha>w/m$ migrate.

Figure 2: Southern Disenfranchisement

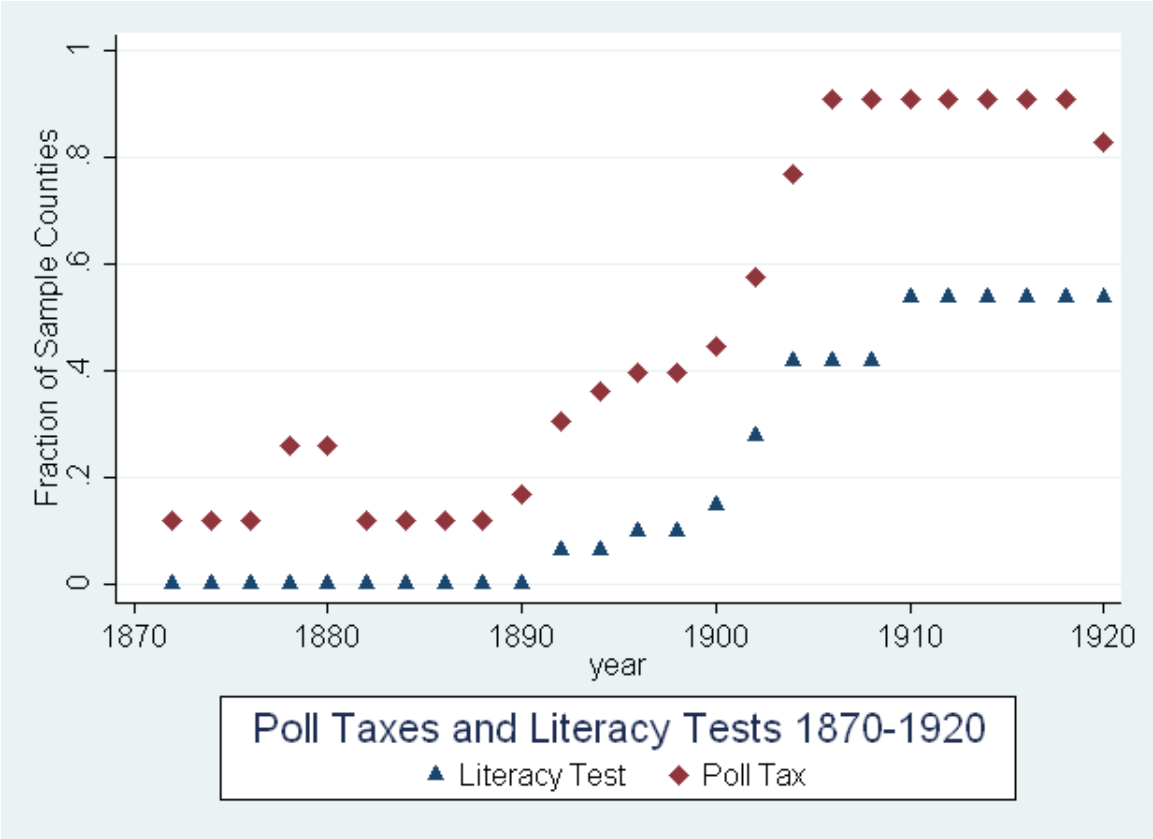


Figure 3: Sample Counties

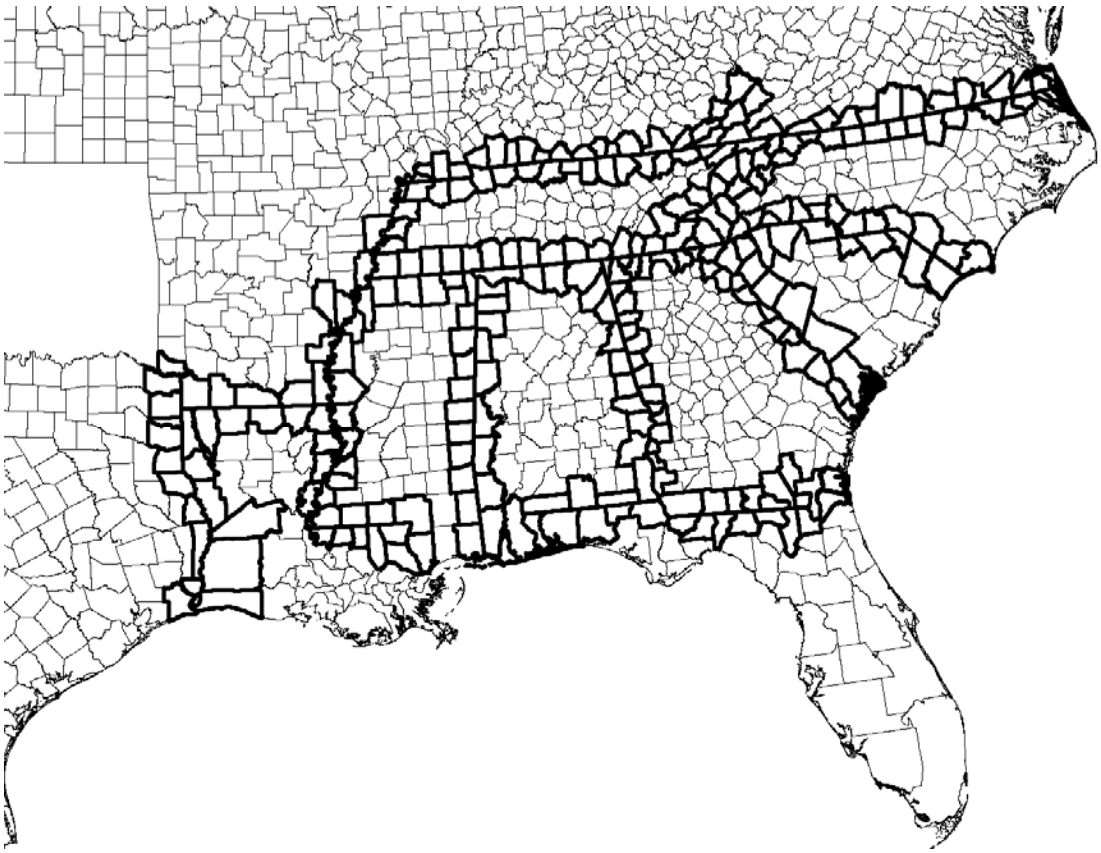
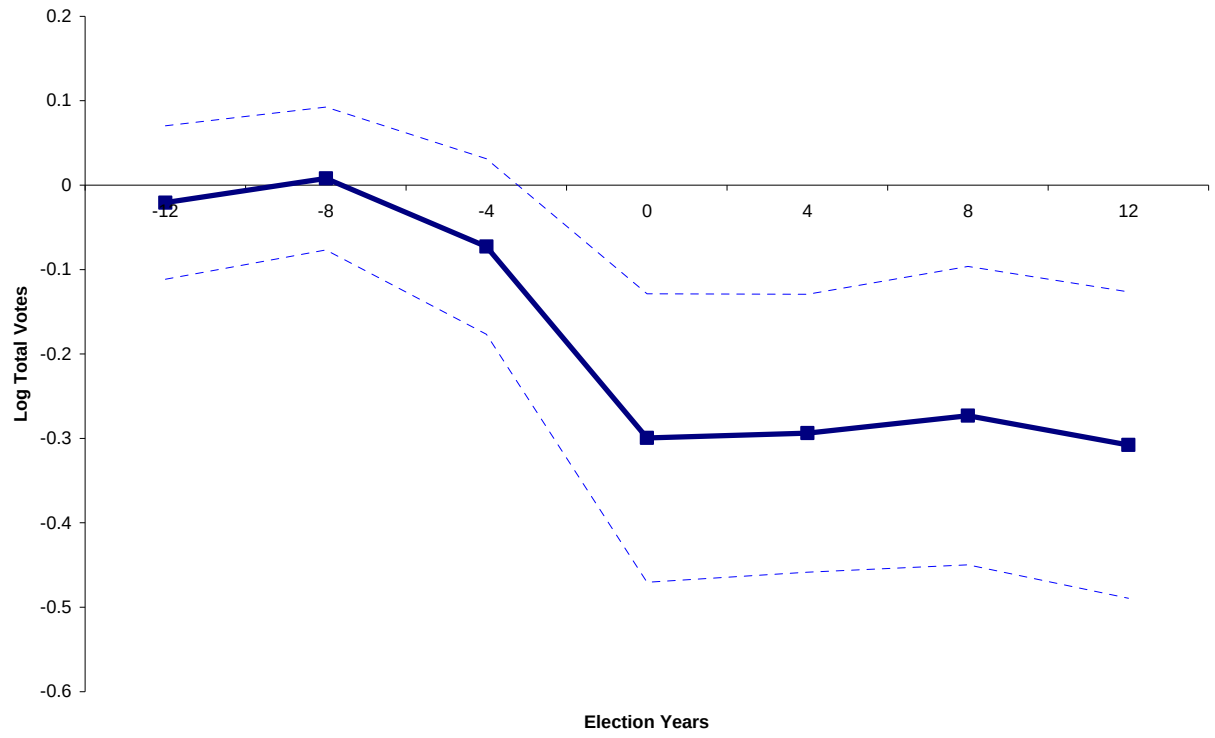
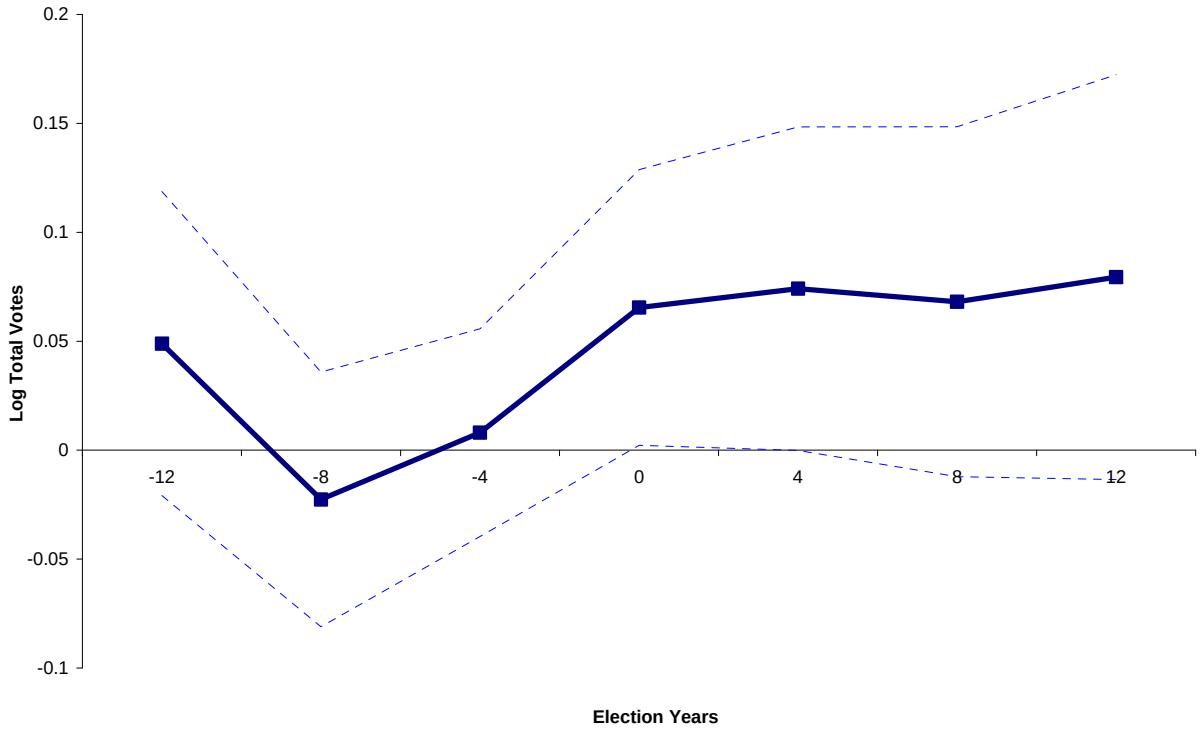


Figure 4a: Cumulative Effect of Disenfranchisement on Log Presidential Total Votes



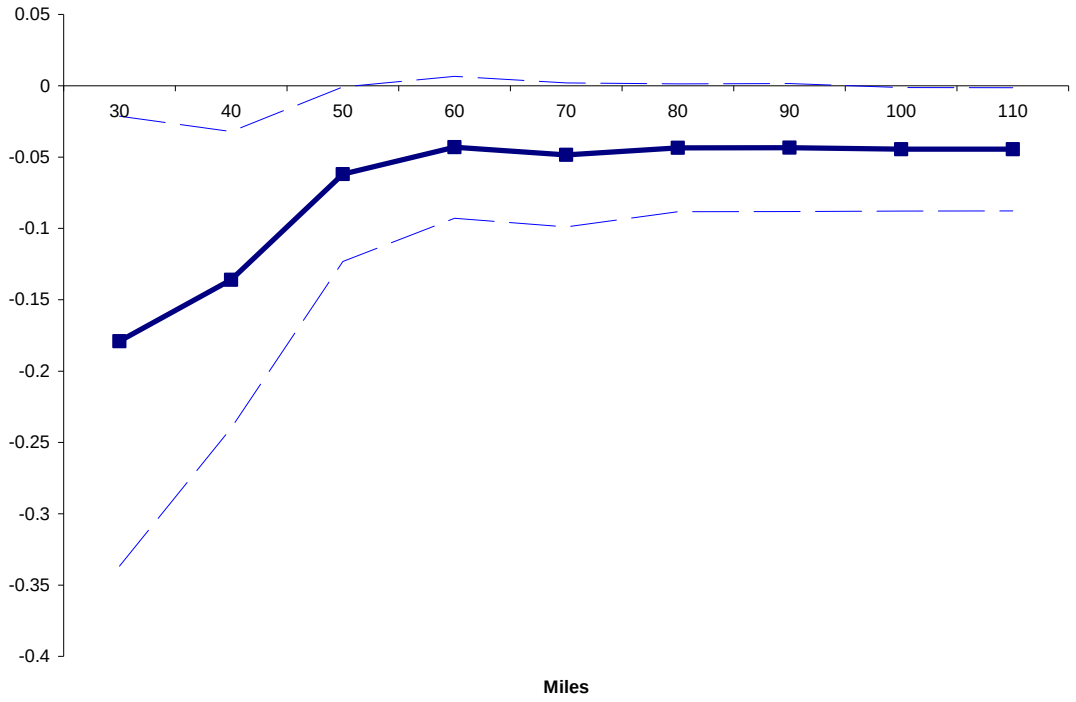
Notes: Points are cumulative (4-year) leads and lags (starting from 12 years before) in the dynamic version of the main specification together with 95% confidence intervals.

Figure 4b:Cumulative Effect of Disenfranchisement on Log Fraction Presidential Democratic Vote



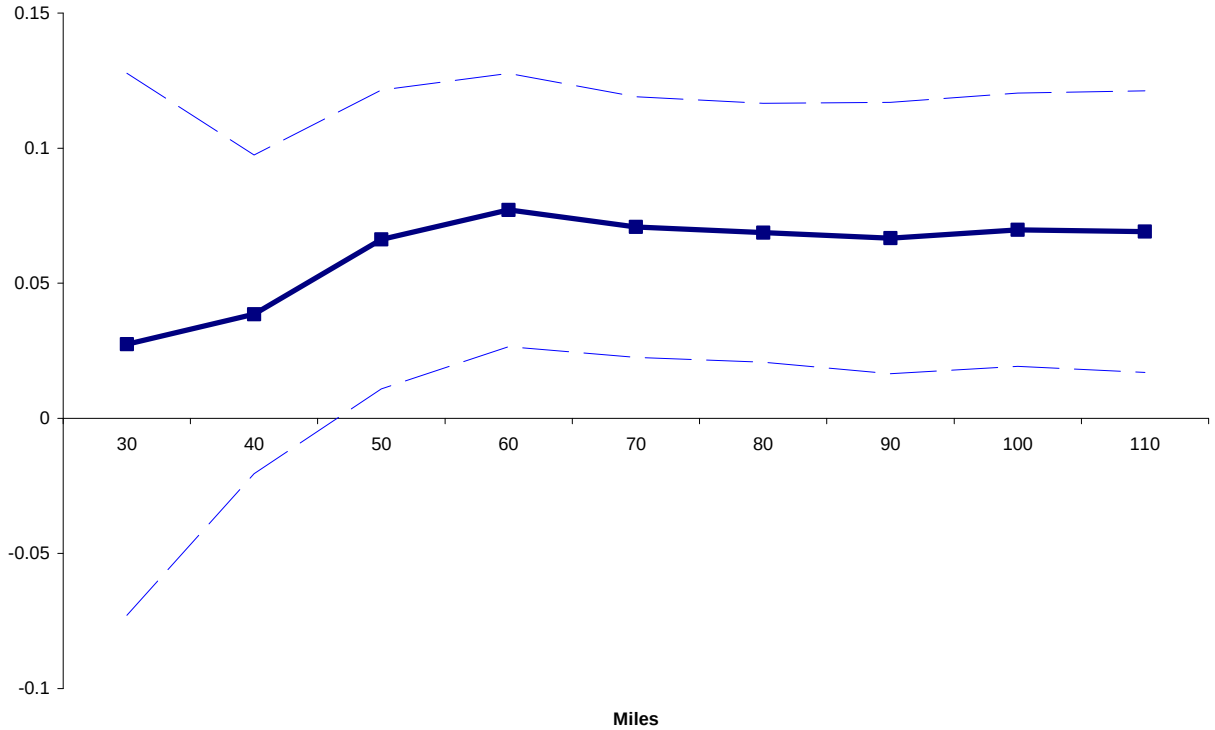
Notes: Points are cumulative (4-year) leads and lags (starting from 12 years before) in the dynamic version of the main specification together with 95% confidence intervals.

Figure 5: Effect of Disenfranchisement on Log Fraction Black by County Pair Centroid Distance



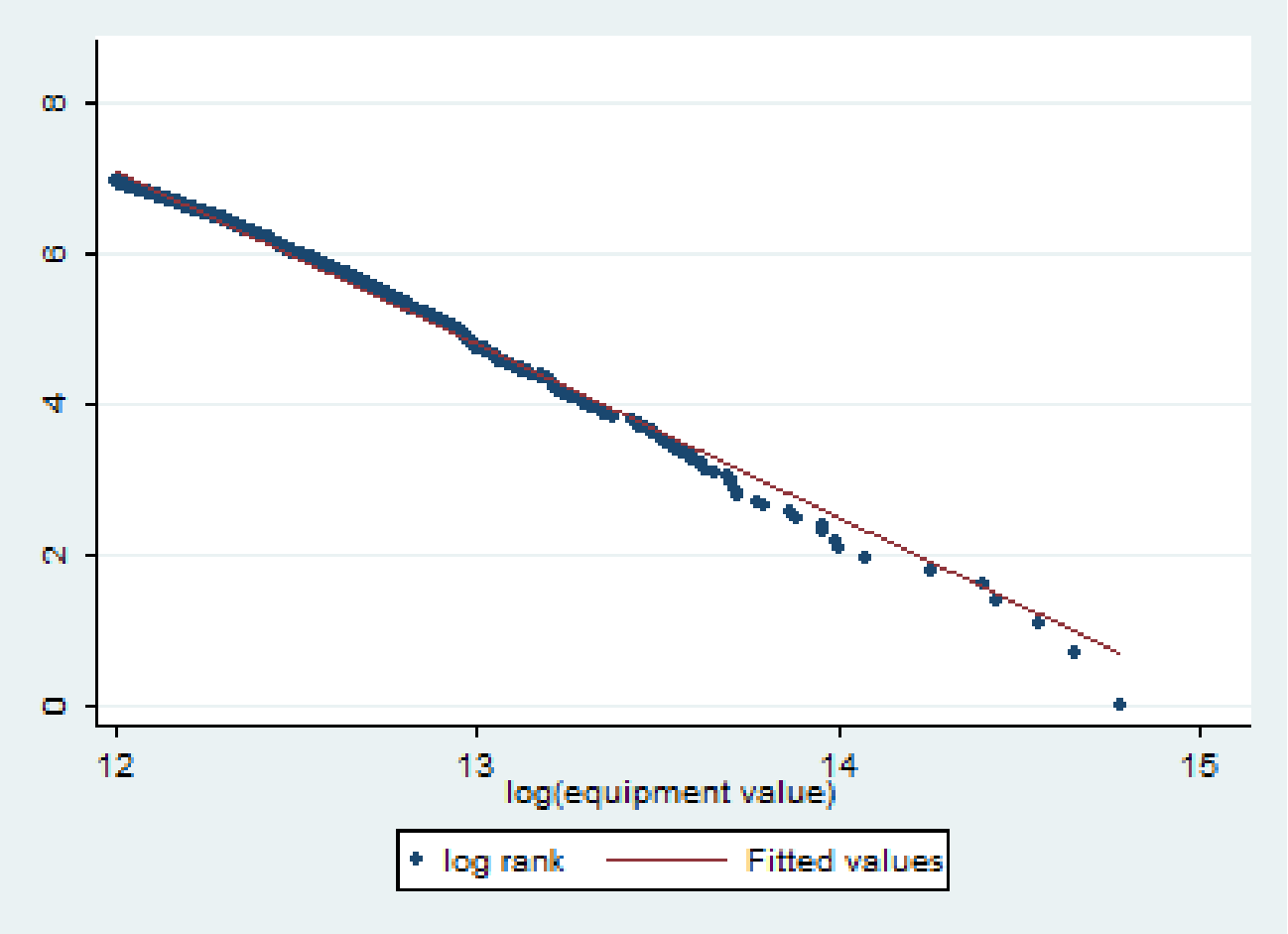
Notes: Points are coefficients from estimates of the main specification on subsamples of counties in pairs whose distance is less than the number on the x-axis, together with 95% confidence intervals.

Figure 6: Effect of Disenfranchisement on Log Land Value by County Pair Centroid Distance



Notes: Points are coefficients from estimates of the main specification on subsamples of counties in pairs whose distance is less than the number on the x-axis, together with 95% confidence intervals.

Figure 7: Tail of Farm Capital Distribution.



Notes: From 1880 Ransom and Sutch agricultural census sample. Includes all white owned farms over 10000$ in equipment value.