Electoral rules and Minority Representation in U.S. cities.

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Abstract

This paper studies the choice of electoral rules, in particular the question of minority representation. Majorities tend to disenfranchise minorities through strategic manipulation of electoral rules. With the aim of explaining changes in electoral rules adopted by US cities, particularly in the South, we show why majorities tend to adopt "winner-take-all" city-wide rules (at-large elections) in response to an increase in the size of the minority when the minority they are facing is relatively small. In this case, for the majority it is more effective to leverage on its sheer size instead of risking to concede representation to voters from minority-elected districts. However, as the minority becomes larger (closer to a fifty-fifty split), the possibility of losing the whole city induces the majority to prefer minority votes to be confined in minority-packed districts. Single-member district rules serve this purpose. We show empirical results consistent with these implications of the model in a novel data set covering US cities and towns from 1930 to 2000.

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1   Introduction

The Voting Rights Act (VRA) of 1965 was meant to protect the right to vote for racial minorities especially in the South. In fact in a reasonably short time it resulted in a massive reinfranchisement of black voters through an unprecedented effort of voter registration. White majorities in cities of the South reacted strategically to this federal legislation by changing the electoral rules of their cities in order to minimize minority representation. They only partially succeeded. Had they not been kept in check by judicial intervention, they would have engaged in even more openly strategic manipulation of rules. This paper presents evidence of such strategic manipulation both around the time of introduction of the VRA and in the after-VRA period.

The two traditional voting rules in American cities are at-large elections, where the majority at the city level elects the representatives on the city council, and district systems, where representatives are chosen in districts or local wards. Proportional representation systems were tried earlier in the past century and then discarded precisely because they favored minority representation (racial and left wing/socialist) too much.[1] In this paper we show (in theory and then empirically) that white majorities expecting an increase in black votes after the Voting Right Act adopted at-large electoral rules when the black minority in the city was relatively small in order to win all seats. However, if the minority share was larger (closer to a fifty-fifty split), the possibility of losing the whole city induced the white majority to confine black votes in minority-packed districts and single-member district: electoral rules serve this purpose.[2]

This paper provides a "positive" model of choice of electoral rules. We do not study how rules should be chosen behind a veil of ignorance to maximize social welfare, but we study how a majority knowing that it may remain such or face a chance of loosing would choose rules in its favor. Therefore the general point raised by this paper is that voting rules are hardly exogenous and are chosen strategically, while a vast literature has taken them as exogenous or predetermined and studied their effects on policy choices[3]. In earlier work we had studied related issues in a

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[1] See for instance the discussion in Alesina and Glaeser (2004) and the references cited therein

[2] Manipulation of electoral rules is not a prerogative exclusive of American cities. For a discussion of electoral rules and racial politics in elections in India see Pande (2003). Alexander (2004, p.211) describes in detail the 1947 Gaullist manipulations of electoral rules in France. In the Paris area where the Gaullist alliance was weak they introduced proportional representation, in rural areas where the alliance was strong, they introduced plurality rule. Kreuzer (2004, p.229) describes strategic manipulation in Germany. One could go on.

[3] For a discussion of the effects of electoral rules taken as predetermined or exogenous see Lijphart (1994) and Persson and Tabellini (2003) for a sample of democratic countries and Baqir (2002) for a cross-section of US cities. Alt and Lowry (1994), Poterba (1994), and Bohn and Inman (1996) amongst others. Mulligan, Gil, and Sala-i-Martin (2004) offer a dissenting view, namely that policies are determined by lobbying pressures that are not much affected by institutional forms of government.

cross sample of countries (Aghion, Alesina and Trebbi (2004)). In the present paper we study U.S. cities, which are an especially interesting case for three reasons. First, it is quite compelling to identify the "majority" with the whites and the "minority" with racial "minorities".[4] Second, the VRA offers an ideal "experiment" of a change in legislation at the Federal Level which prompted strategic adaptation of local rules. Third, U.S. cities present substantial cross-sectional and time variation in their electoral rules.

This "positive" and strategic approach to models of voting rules is relatively recent and rare,[5] since most of the literature on constitutional choice of voting rules is normative, starting from the work of Hayek (1960) and Buchanan and Tullock (1962)[6]. A normative approach usually characterizes works in Political Science as well, with some notable exception such as Lipset and Rokkan (1967), Riker (1986) and several essays in Colomer (2004).

The paper is organized as follows. Section 2 develops a simple formal setup. Section 3 describes the institutional context of US city governments and introduces our data. Section 4 presents our empirical results. The last section concludes.

2   A model of the choice of electoral rules

2.1   Basic setup

There are two groups of voters in a city, whites (W) and blacks (B). The initial relative size of the blacks is $1/2 > \pi > 0$, so that the size of the larger white group is $(1 - \pi)$. The whites are, initially at least, a majority and they are those who choose the electoral rule for the city (in short, we call the choice of the electoral rule the "constitution"). The population is equally spread over three (exogenously apportioned[7]) electoral districts, numbered $1, 2, 3$, each with M individuals, and the city council consists of three seats. The initial number of black and white voters in each district are given by B_i and W_i for $i = 1, 2, 3$. We assume that $W_1 = M$, and $W_2 = W_3 = \left(\frac{1}{2} + z\right) M$, where z is a real number between $-1/4$ and $1/2$, which insures that $0 < \pi < 1/2$, since:

$$z = \frac{1 - 3\pi}{2}. \tag{1}$$

[4]For discussion of the importance of race in American local politics, see for instance Hacker (1992), Huckfeld and Kohfeld (1989),Wilson (1996) and Alesina, Baqir, and Hoxby (2004).

[5]Alesina and Glaeser (2004) discuss how the choice of alternative electoral rules, which are themselves associated with different policy choices over the welfare state, are indeed the result of strategic constitutional choices.See for instance the work of Acemoglu and Robinson (2006) on the origin of democratic institutions.

[6]For a survey of the literature on Constitutional Theory, see Voigt (1997).

[7]The model will abstract from gerrymandering of the electoral districts and the vast literature on the matter. On gerrymandering, see Cox and Katz (2002) and Friedman and Holden (2005).

The parameter z is a shift term which allows to vary the initial number of black voters in a district and links the city-wide racial composition to the district-wide racial composition. The white majority chooses the electoral rule, through which a three-member council is elected. After the constitution is chosen, there is a shock to the composition of voters in the city, to which the electoral rule cannot be made contingent upon.[8]. More formally, during the interim phase (defined as the time span between the choice of electoral rule and the election of the council) an exogenously given mass L_N of new black voters joins the polity, with $L_N = \alpha M$ where α is a random variable uniformly distributed between 0 and an upper bound $\overline{\alpha} \in (1,2)$. Half of the newcomers locate in district 2, and half in district 3.

Different compositions of the council imply different policies, and therefore different ex post payoffs for the white. $\underline{r}$ (resp. u_0 and $\overline{r}$) is the utility level of a white agent when there are no (resp. one and two) white representative(s) on the council. The ex ante expected utility of a white constitution writer can then be expressed as:

$$U_w = (1 - p_0 - p_1)\overline{r} + p_1 u_0 + p_0 \underline{r}, \quad \overline{r} > u_0 > \underline{r}$$

where p_j denotes the probability that j council representatives are white at the interim stage. Thus, having some representation is better than having none at all[9] and that, in general, voters' preferences are increasing in their electoral representation. The electoral rule chosen by the white voters determines the value of p_0 and p_1. Summarizing: 1) The electoral rule is chosen by the white group; 2) New black voters join the polity and elections determine a given composition of the council; 3) Payoffs realize.

2.2 Electoral rules and expected utilities

With an eye to the case of American cities, we now study two alternative electoral rules. The first one, "at-large" (AL), allocates all seats to the party which wins more than fifty percent of the votes of the entire city. The second rule, "single-member district rule" (SD), requires that each candidate runs in a particular district and obtains a majority of votes in that district. These are reasonable approximations of the electoral rules in US cities although details of electoral fomulae vary considerably across municipalities. Given our assumptions on the group composition of the three districts, $p_1 = 0$ under the AL rule, and $p_0 = 0$ with the SD rule. Under the at-large rule

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[8] See Laffont (2000) and Aghion and Bolton (2003) for a detailed discussion of this "incomplete contract" approach to constitutions in political economy.

[9] See Alesina and Rosenthal (1995) for a legislative model and an extensive discussion of this assumption and a comparison with alternatives.

the ex ante expected utility of constitution writers in the W group is:

$$U_W^{AL} = p_0^{AL}\underline{r} + (1 - p_0^{AL})\overline{r} = \overline{r} - p_0^{AL}\Delta,$$

where $\Delta = \overline{r} - \underline{r}$ is the loss from losing the majority, and $p_0^{AL} = \Pr(\alpha > 1 + 4z)$ is the probability of the white losing the majority under AL[10]. Substituting for z as a function of π in p_0^{AL} using (1), the ex ante expected loss of the whites (relative to the bliss point $\overline{r}$) under the AL rule, is equal to $L_W^{AL} = p_0^{AL}\Delta = \left(1 - \frac{3}{\alpha}(1 - 2\pi)\right)^+ \Delta$, where we use the notation $x^+ = \max\{x, 0\}$. Under the SD rule council seats are allocated at the district level. The probability p_1^{SD} of the blacks winning a majority of two seats is equal to the probability that districts 2 and 3 be won by the blacks. Then the ex ante utility of the whites under the single-member district rule, can be expressed as:

$$U_W^{SD} = p_1^{SD}u_0 + (1 - p_1^{SD})\overline{r} = \overline{r} - p_1^{SD}\delta,$$

where $\delta = \overline{r} - u_0$ is the constitution writers' loss from losing the majority. Substituting for z in the probability $p_1^{SD} = \Pr(\alpha > 4z)$,[11] and using (1), the ex ante expected loss of white constitution writers under the SD rule is equal to $L_W^{SD} = p_1^{SD}\delta = \left(1 - \frac{2}{\alpha}(1 - 3\pi)^+\right)^+ \delta$.

2.3   The size of minorities and the choice of electoral rule

Ex ante at the constitutional stage, the whites choose the electoral rule that minimizes the expected loss L_W. If initially the whites command a very large majority of votes, the constitution writers do not fear they can lose the majority under either rule, thus they are indifferent between the two rules. As the relative size of the blacks increases, however, at some point it becomes preferable for the whites to move to AL in order to reduce the power of the black voters in districts 2 and 3 by confronting them with the whole pool of white voters, including those in district 1. Doing so allows the whites to preserve their majority in the council. When the fraction of blacks reaches the point that it becomes impossible to insure that for every realization of α they might become the new majority, moving to the SD rule allows the whites to limit their possible losses: as π becomes sufficiently close to $1/2$, the risk of losing all three districts and thereby incurring the large loss Δ makes the whites prefer a SD system. In fact SD guarantees the whites at least 1 seat on the council - and thereby limits their loss to $\delta < \Delta$, given that in this case black voters are restricted to commanding districts 2 and 3 only. More formally:

Proposition 1 (a) Both rules AL and SD involve no utility loss to whites when $\pi \in \left(0, \frac{1}{3} - \frac{\overline{\alpha}}{6}\right)$; (b) if $\Delta > \delta$, then there exists a unique cut-off point $\widehat{\pi} \in \left(\frac{1}{3} - \frac{\overline{\alpha}}{6}, \frac{1}{2}\right)$ such that $L_W^{AL} < L_W^{SD}$ if

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[10] This probability is obtained by considering $p_0^{AL} = \Pr(B_1 + B_2 + B_3 + L_N > W_1 + W_2 + W_3)$.

[11] This is the probability that blacks win a two-seats majority, or $p_1^{SD} = \Pr\left(B_3 + \frac{1}{2}\alpha M > W_3\right) = \Pr(\alpha > 4z)$

$\pi \in \left(\frac{1}{3} - \frac{\overline{\alpha}}{6}, \widehat{\pi}\right)$ *and* $L_W^{AL} > L_W^{SD}$ *if* $\pi \in \left(\widehat{\pi}, \frac{1}{2}\right)$; *(c) if* $\Delta = \delta$, *then for all* $\pi \in \left(\frac{1}{3} - \frac{\overline{\alpha}}{6}, \frac{1}{2}\right)$ *the AL rule dominates the SD rule.*

Proof. In Appendix. ∎

Figure 1 represents graphically the loss functions L_W^{AL} and L_W^{SD} where π_0^{AL} (resp. π_0^{SD}) is the size of the minority at which the expected loss under AL (resp. SD) becomes positive.

2.4 N districts and mixed systems

We now consider two empirically relevant generalizations of the problem. Suppose that the population is equally spread over N electoral districts with M individuals in each, which elect a council of size N. We maintain a distinction between two types of districts: districts with $W_1 = M$ and districts with $W_2 = \left(\frac{1}{2} + z\right) M$, where W_j denotes the number of whites in a type-j district. Type-1 districts are white, whereas type-2 districts are an ex ante identical mix of whites and blacks. There are N_1 type-1 districts, therefore $N_2 = N - N_1$, and $N_1 < N_2$. During the interim phase a mass αM of black newcomers arrives with $\alpha \sim U[0, \overline{\alpha}]$ and $\overline{\alpha} < N$. Assume that the whites' utility $u(.)$ is defined over the share of seats won, where we indicate $\Delta = u(1) - u(0)$ and $\delta = u(1) - u(N_1/N)$, following the notation of Proposition 1. Proposition 1 then generalizes to the $N-$ district case: namely, we can show that there exist a first cut-off point $\pi_0^{SD} \in \left(0, \frac{1}{2}\right)$ such that there is no utility loss for the whites in $\left(0, \pi_0^{SD}\right)$ under any rule, and a second cut-off point $\hat{\pi} \in \left(\pi_0^{AL}, \frac{1}{2}\right)$ [12] such that expected losses under the two rules AL and SD satisfy

$$L_W^{AL} < L_W^{SD} \text{ if } \pi \in (\pi_0^{SD}, \hat{\pi}); L_W^{AL} > L_W^{SD} \text{ if } \pi \in \left(\hat{\pi}, \frac{1}{2}\right).$$

Consider now the case of mixed electoral rules for risk-averse white voters. Consider a city with a council of size $N_{TOT} = \rho N$. Let us now assume $\rho > 1$ to allow for mixed systems: at least one representative for each single-member district and $N_{AL} > 0$ at-large representatives. Assume whites' preferences to be defined again over the share of seats won on the council. In a setup with risk-neutral agents, it is never optimal to have mixed systems involving both single-district and at-large councilmen: either AL or SD offers the highest expected number of winning seats. While a risk-neutral white agent considers exclusively the expected seat-share and has no incentives to convexify, a risk-averse constitutional writer may find useful to reduce the risk of running pure at-large elections when the opportunity of winning safer single-district seats is available. The following proposition presents this result more formally:

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[12] Where: $\pi_0^{AL} = \frac{1}{2}\left(1 - \frac{\overline{\alpha}}{N}\right) > \pi_0^{SD} = \frac{N_2}{2N}\left(1 - \frac{\overline{\alpha}}{N_2}\right)$.

Proposition 2 *Consider a city of N districts, council of size N_{TOT}, and black newcomers' arrival αM, $\alpha \sim U[0, \overline{\alpha}]$, $N_1 < \overline{\alpha} < N$. If the white constitutional writers are risk-averse with utility $u(.)$, $u' > 0$, $u'' < 0$, defined over the share of seats won, then there is an interval (π_3, π_4), $\pi_4 < 1/2$, and a mixed system with $N_{SD} > 0$ single district seats and $N_{AL} > 0$ at-large seats for which $U_W^{AL} < U_W^{MX}$ and $U_W^{SD} < U_W^{MX}$ if $\pi \in (\pi_3, \pi_4)$, where U_W^{AL} is the expected utility under AL, U_W^{MX} is the expected utility under a mixed system, U_W^{SD} is the expected utility under SD.*

Proof. In Appendix. ∎

Figure 2 reports a numerical example of the optimal share of single-member district councilmen as a function of the ex ante size of the minority for a stylized city of $N = 12$ districts with $N_1 = 3$, $\rho = 5$, and white voters with quadratic preferences, as generated by the model. The fundamental non-linearity in the choice of the electoral rule extends to the case of mixed systems (notice the ascending part of the step-function that indicates the choice of mixed systems). The parabolic curve (quadratic fit) that approximates the relation between π and the ratio of SD seats in the council (indicated as $SDshare$) is precisely the relation we will investigate empirically in Section 4. Figure 3 reports the expected utilities for the whites under the different electoral rules at various levels of π. The mixed system curve traces the combination of SD and AL seats that is optimal (i.e. that has the highest expected utility for the whites) at any given π. Over the range where such curve does not coincide with either pure SD or pure AL the chosen electoral rule includes both single-member district and at-large councilmen.

3 Institutional setting and data

3.1 The Voting Rights Act and its implementation

There was no constitutional protection for voting and electoral participation in the United States before the Civil War.[13] African American individuals in state of servitude were neither granted citizenship nor voting rights. After the war, during the Reconstruction (1867-1877), Congress provided such constitutional protection with the ratification of the 14th Amendment in 1868 (conferring citizenship to all persons born or naturalized in the United States) and the 15th Amendment in 1870 (providing that the right of vote should not be denied or abridged on the basis of race, color, or previous status of servitude). It is widely acknowledged that the Reconstruction failed to truly enfranchise black voters in the South, whose representation in fact went steadily down from the 1870 to the 1960 due to various de facto obstacles to their registration. This does not mean of

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[13] We refer to the United States Department of Justice, Civil Rights Division, Voting Section for further details and reference for this section.

course that no black person would vote, but the share of black voters was quite small. In 1868 there were 300 blacks elected to state legislatures from confederate states, in 1900 there were 5[14]. The Progressive-era (1900-17) fostered substantial institutional innovations in the direction of reducing representation of minorities. At-large elections were widely introduced both in the South and in the North with the purported scope of curbing corruption and log-rolling between localized factional interests, historically represented by SD, but de facto aiming at reducing the influence of immigrants and (the very few) black voters.

President Lyndon Johnson ratified the 24th Amendment of the Constitution[15] (1964) and signed into law both the Civil Rights Act in 1964 and the Voting Rights Act in 1965. LBJ relied on a coalition of Northern democrats and republicans to pass the act against the opposition of Southern democrats. The goal of the VRA was (and is) to remove obstacles in voting registration procedures for racial minorities. Section 2 of the Act included a broad reassessment of the principles embedded in the 14th and 15th Amendments. It deemed illegal the use of poll taxes, literacy tests, and the requirement of fluency in English for voting eligibility. As a consequence of the Voting Rights Act, the number of registered minority voters as a fraction of voting age population doubled and in some cases tripled in Alabama, Georgia, Louisiana, Mississippi, and Virginia between 1965 and 1988 (Grofman, Handley and Niemi, 1992)[16]. Even though white Southerners grudgingly had to remove obstacles to black registration (penalty was jail) they immediately started trying to change electoral laws in order to minimize the probability of electing black representatives. For instance already in January 1966 an all-white legislature in Mississippi without much discussion and unanimously passed 13 bills concerning the election process, most of them moving various type of elections to an at large system[17]. The purpose was clearly to dilute black votes. Eventually in 1969 in Allen vs. State Board of Election the Supreme Court struck down most of these bills. In fact the mid-sixties mark the beginning of a long series of court battles about vote diluting, gerrymandering, and various other maneuvers of the white majority to minimize black influence. Different lower courts ruled

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[14]See in particular the discussion in Kousser (1999) and Grofman and Davidson (1992).

[15]The amendment outlawed the poll tax in federal elections. Virginia ratified the amendment in 1977, albeit the ratification process was completed on January 23, 1964 (by 38 States). The amendment was ratified by North Carolina in 1989. The amendment was rejected by the State of Mississippi (and not subsequently ratified) in 1962.

[16]Amy (2002) reports that "the number of black elected officials in the United States grew an average 16.7 percent a year between 1970 and 1977, from 1469 to 4311" (p.129). In 1999 according to the Joint Center for Political and Economic Studies the total number of black elected officials was 5938 in the South (respectively 8936 in all U.S.), of which 340 were city mayors (resp. 450 nationwide), 2677 members of municipal governing bodies (resp. 3498 nationwide). There were no black senators in 1999 and 19 representatives from the South (39 black representatives nationwide). See also Cole (1976).

[17]See the detailed discussion by Parker (1990).

in different ways and there was much uncertainty about how each specific ruling would go given the complexity of the issues involved[18]. Because of all these disagreements in the lower courts, the Supreme Court in 1980 took on the Case of City of Mobile versus Bolden and established the need to prove discriminatory purposes when challenging a change in electoral rules[19]. The language of the majority opinion suggested very high standard of proof for active discrimination[20]. In a reaction to this ruling a 1982 Congress Amendment, dispensed from such proof. Finally, in 1986 in the ruling of Thornbourg versus Gingles the Supreme Court clarified what had to be considered active discrimination in a series of points, including the presence of block voting, a history of racial discrimination, evidence of vote diluting, gerrymandering, etc. While the court did clarify the issue, still a very large grey area persisted. For instance, as our model itself suggests, the fact that moving to at-large election may dilute black votes, but sometimes moving to single-member districts may disadvantage blacks as well was already in the minds of litigants in the seventies, eighties and nineties (see Chapter 5 of Grofman Handley and Niemi (1992)). Also it was not clear how many of the points were necessary and/or sufficient to prove discrimination. This is not a failure of the Court per se, but just reflects the complexity of the issues at hand.

From this brief historical excursus, we need to remember three points germane to our empirical analysis: 1) Until the mid-sixties white majorities did not have to worry about black vote in the South; only with the Voting Act of 1965 blacks were really a political block to reckon with electorally. 2) The implementation by the Courts of the Voting Rights Act also took up the issues of the choice of electoral rules, precisely to avoid choices (like at-large elections) that would have favored the white majority. 3) Attempts of the white majority to change electoral laws were kept in check by the Courts which became increasingly concerned. But at least well into the eighties and even beyond that much uncertainty remained about what could or could not be challenged in courts. So a fair amount of room for maneuver remained for the white majority to strategically manipulate electoral rules. In a sense, without courts interventions our finding below would be

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[18]For a revealing review of extremely different point of views held by opposing expert witnesses in the cases see Grofman et al. (1992) in Grofman and Davidson (1992).

[19]In 1980 the Supreme Court imposed the requirement of proof of "racial discriminatory purpose" in vote dilution cases (Mobile v. Bolden, 446 U.S. 55, 1980). This was rectified by a 1982 Congress Amendment, dispensing from such proof. The Supreme Court substantially challenged "affirmative gerrymandering" in Shaw v. Reno, 509 U.S. 630 (1993) and Holden v. Hall, 512 U.S. 874 (1994) among the others. Under President Bill Clinton the National Voter Registration Act (also known popularly as the Motor Voter Act of 1993) aimed at strongly promoting voter registration (for example, through the department of motor vehicles structures, unemployment, and welfare bureaus). More recently the Help America Vote Act of 2001 has shifted back to individual States most of the supervisory power over the quality of electoral franchise. Voting Rights Acts renewal hearings are due in 2007.

[20]See Grofman, Handley, and Niemi (1992).

even stronger, since the white majority could have acted unconstrained.

3.2 Data and summary statistics

This section briefly reviews the main variables employed in the empirical analysis. We refer the reader to the separate Data Appendix[21] for details on variables definition, construction, and sources. We gathered two sets of data: one including characteristics of city governments and their institutional details; the other including demographic, economic, and geographic characteristics of US cities. We collected information on US municipal governments characteristics for the period 1930-2000, at 10-year intervals, from the Form of Government Survey and Municipal Year Book by the International City/County Management Association (ICMA) in Washington D.C.[22]

From the various issues of the ICMA surveys[23] we collected information on electoral rules and forms of government for each municipality, including: council size; number of district-awarded council seats; number of councilmen belonging to different racial groups currently sitting in the council. We constructed a single-district variable $SDshare$, a continuous variable defined as the fraction of councilmen elected in single districts. In 2001 about 65.9 percent of the cities in the sample presented only at-large-elected councilmen, about 14.8 percent presented only district-elected councilmen. The remaining cities had some combination of the two types of rules (mixed), with councils consisting of a fraction of councilmen representing specific geographic areas and the others "representing the whole city".

From the decade issues of the Bureau of the Census' of Population we collected information on total population, racial groups sizes, median household income, and geographic characteristics of Places and Minor Civil Divisions (MCD's)[24]. With regard to racial composition, from 1930 to 1970 the data available allow for a breakdown into three groups: white, black, and other races (we did not distinguish between foreign-born or native). From 1980 the Census allows for a more refined racial breakdown[25]. Since our empirical analysis runs from the thirties to the nineties, for

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[21]Due to space limitations we produce the Data Appendix in a separate document, available on request. Please refer to the authors' webpages for a downloadable version of the Data Appendix.

[22]ICMA is a professional organization of city managers and administrators publishing local government data since 1914 and a recognized scholarly source. ICMA data have been employed in a number of papers, including Baqir (2002), Sass and Pittman (2000), DeSantis and Renner (1992) among the others.

[23]Data from 1980 onward are available in electronic format; data before 1980 needed to be collected and entered from hard copies. For this reason we decided to collect data before 1960 only for the South, since it is in the South where the effect of the Voting Rights Act is more relevant and should show larger differences before and after the mid-1960s.

[24]Definitions and references in the Data Appendix.

[25]In general the breakdown includes at least Whites, Blacks, Hispanics, Asians, Pacific Islanders, and Native Americans.

consistency we used the three-groups breakdown (white, blacks, others) for the entire sample. Our variable of interest is the size of non-whites.

A final caveat. ICMA surveys present different coverage depending on the year. We review their representativeness in terms of population characteristics vis-a-vis the corresponding entire US Census of Population places and MCD's in the Data Appendix. The bottom line is that the sample of US cities collected by ICMA is representative of the total population of relatively large cities, above $2,500$ inhabitants, and less representative of the full population of the Bureau of the Census Places and Minor Civil Divisions (MCD's). This is the reason why in what follows we always report results for cities above the threshold of $2,500$ [26]. In the Appendix Tables A1 and A2 we report summary statistics for the key variables of interest for the sample of all US cities and for the sample of Southern cities.

4 Empirical results

We now focus on the main prediction of our model, namely that *the preference of whites for at-large rules over single-member district increases and then decreases with the initial size of the minority group.* This section reports four results. First, we present cross-sectional and panel evidence of our main prediction for US cities during the entire period *after* the enfranchisement of minority voters (the VRA). Second, we show the absence of a relationship between at-large and single-member district rules and the initial size of the minority group during the entire period *before* the VRA in the South. Third, we focus on the changes taking place *around the VRA* (immediately before and after the treatment). Fourth, we consider the evidence that an effect of electoral rules on minority representation is present and operates according to the intuition of the model.

4.1 The choice of electoral rules

Empirical Strategy - The empirical strategy in Table 1 and in the majority of the following tables is a simple, yet flexible, linear (in the coefficients) parametric model of the choice of electoral rules. For each city i in year t let us define the electoral rule variable, $SDshare_{it}$, the relative size of the non-white minority, π_{it}, a vector of $(k$ x $1)$ controls X_{it}, in our baseline specification: the log of city population and median household income. We specify the following equation in levels:

$$SDshare_{it} = \beta_0 + \pi_{it}\beta_1 + (\pi_{it})^2 \beta_2 + X'_{it}\gamma + u_{it} \qquad (2)$$
$$\text{for } i = 1, ..., N \text{ and } t = 1, ..., T \text{ .}$$

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[26] We were also able to obtain the full lists of cities sampled from ICMA for the last survey in year 2001 and we verify the absence of any response selection in the survey; see the Data Appendix.

We perform our analysis both in a cross-section for given t and in a two-way panel in which we account for unobserved, time-invariant heterogeneity at the city level and for time-specific effects[27]. In the latter case we assume a two-way error component $u_{it} = \alpha_i + \delta_t + \eta_{it}$. Employing within-city variation allows us to account for unobserved heterogeneity and estimate consistently the vector $\beta = (\beta_1, \beta_2)$. Time-specific effects are similarly useful in accounting for across-the-board effects, such as federal legislation, that again need to be controlled for, especially in the post-1965 period when legislation was extremely active. We address the issue of serial correlation in the error component η by relaxing the assumption of independence and clustering at the city level. Conditional heteroskedasticity of unknown type is also accounted for in all standard errors both in the cross-section and the panel results.

Identification - The most likely source of reverse causation affecting (2) is endogenous sorting across municipalities driven by more favorable electoral rules. However, Tiebout sorting would predict a correlation between changes in city racial composition and in electoral rules of the *opposite* sign to what predicted by our model, dampening the least squares estimates towards zero.

To see this, suppose that, given a small size of the minority, π, a city changes its electoral rule in favor of white voters against black voters by decreasing the number of single-district seats on the council. In this case Tiebout sorting would predict a decrease in the size of the minority (blacks would leave the city and possibly more whites could join in), implying a *positive* correlation between the share of single-district seats and the size of the minority at small π. Now suppose that, given a large size of the minority, π, a city changes its electoral rule by increasing the number of single-district seats on the council. Under the basic setup of Proposition 1 this produces an unambiguous reduction of the expected utility of the blacks. Tiebout sorting would predict a decrease in the size of the minority (blacks would leave the city and possibly more whites could join in), implying a *negative* correlation between the share of single-district seats and the size of the minority at large π. However, it is enough to move to our more general theoretical setup including risk aversion to see that moving towards single-member district at high π may produce an increase in the utility of both groups. In this case Tiebout sorting could produce an overestimate of the true slope of the $U-$ curve in the rightmost range of π. We address this potential endogeneity. by instrumenting the fraction of the minority with 10 years lags and geographic location (an indicator variable taking value 1 if the city is in the South). Distant lags and geographic location should be considered predetermined or exogenous (the case for South) and therefore valid instruments of current size of the minority. Exclusion restrictions can be tested given overidentification of the system.

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[27] Formal F-tests for this specification support the use of a two-way setup. Both groups of fixed effects are jointly significant in every specification.

Results - Table 1, presents the results concerning the main non-monotonicity. The Table refers to the sample of US cities[28] in 1990 for the cross-sectional analysis (in columns 1-3) and to the period 1970-2000 for the panel analysis (columns 4 and 5). The model calls for a negative linear and a positive quadratic coefficient on the share of the non-white minority[29]. The signs of the coefficients are consistent with this story and significant at standard confidence levels both individually and jointly. Looking at column (1) the estimated coefficients imply that the $U-$ shaped curve reaches a minimum (indicated with π^*) at about 43.8 percent non-white minority. (Note that 94.5 percent of the cities in year 1990 were below this level). In column (2) we include for robustness a larger set of controls, of which we do not report the coefficients. For column (2) the controls are: the squared log of city population and income, the fraction of population employed in manufacturing, agriculture, mining, trade, financial services, and fraction above 65 years of age. The estimated coefficients support qualitatively the results of column (1) with a lower minimum at 0.388 and are again individually and jointly significant.

Column (3) reports 2SLS estimates of the specification in column (1). Consistently with our previous discussion concerning identification, the coefficients on the linear and quadratic terms become larger in absolute value and outside the 95 percent confidence interval for the estimates of column (1). This finding seems to suggest a reduction of the possible attenuation bias stemming from Tiebout sorting. A J-test for overidentification of all instruments produces a p-value of 0.12, thus not rejecting the validity of the instruments set in terms of exclusion restrictions. It is a low value, however, given the low power properties of the test. The minimum for the $U-$ shaped curve is estimated at 0.318 minority size.

In columns (4) and (5) we tackle the issue of unobserved heterogeneity at the city level in our baseline specification and in one where additional controls are added. For column (5) controls are the squared log of city population and median income. We obtain estimates of $\beta = (\beta_1, \beta_2)$ close to the 2SLS estimates and statistically significant at the 1 percent confidence level (both individually and jointly).

To gauge quantitatively the size of the two effects in Table 1, we can start from the empirical

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[28] As for all the rest of our empirical analysis we exclude from the sample those cities for which we have information that the change of structure of government is the result of court mandate or State Law. We also exclude cities below 2500 as the ICMA sample is representative of the US Census of Population places and MCD in this group. Similar results were obtained when employing the complete sample of municipalities or performing the cross-sectional analysis for the years 1980 and 2000.

[29] Note that one may want to exclude cities in which whites are a minority. There are very few of those and in addition even when whites are a minority in terms of number of inhabitants, demographic factors and vote participation patterns may still make them a majority as active voters (see Amy 2002 for an example). For this reason it is unclear which cities to drop from the sample. We tried a few experiments and our results appear robust.

distribution of minorities in US cities in year 1990 for the cities in our sample[30]. The median (Q5) for the fraction of minority is 5.5 percent and the ninth decile (Q9) is 34.3. At Q5, given estimated coefficients in column (4) of -0.622 and 1.078 (with robust standard errors respectively 0.202 and 0.284), an increase of one standard deviation of minority sizes (15.3 percent) implies a reduction of -5.3 percent of the fraction of single-district seats. This is equivalent to about $1/3$ seat switching from single-member district to at-large in a council of 6 seats (the mean council size in the 1990 sample). At Q9, the same increase of one standard deviation would instead produce an increase of about $+4.4$ percent in the fraction of single-district seats. This would be equivalent to more than $1/4$ seat switching from at-large to single-district in a council of 6 seats. The estimates are quantitatively reasonable, since the voting rights legislation over the years has imposed increasing limits on institutional changes.

We also separately run a battery of robustness checks that we do not report for parsimony of presentation First, we have considered a discrete version of our dependent variable, SD, and found analogous evidence of the main non-monotonicity for both the cross-section and the panel (using conditional logit fixed effects). Similarly we have considered a (two-sided) limited dependent variable (LDV) approach: a Tobit and IV Tobit estimator for columns (1)-(3) and a random effects Tobit estimator grouping observations at the city level for columns (4)-(5). This is a way of incorporating the empirical feature that $SDshare$ is constrained to be in $[0, 1]$. The implications of Table 1 carry over to the LDV specification consistently with the predictions of Proposition 1. Second, since time dependence is an important characteristic of political systems, we have included the $t - 10$ lag of $SDshare$ and employed a standard dynamic panel technique, through first differencing and application of the Arellano and Bond (1991) GMM estimator. The consistency of the standard linear model and this dynamic extension are source of reassurance. The dynamic model delivers larger effects, in the range of $1/2$ seat in a council of 6 (towards and away from AL), especially for the South. Third, we have also considered a simple non-parametric approach, expecting to observe two basic regularities in the data: 1) the slope of a within-city regression of the single-district variable on the fraction of the minority should be increasing in subsamples where the average minority size is increasingly higher; 2) we would expect statistically significant coefficients of negative sign to appear at relatively small values of the fraction of the minority (where the steeper downward-bending part of the U) and statistically significant coefficients of positive sign to appear at relatively large values of the fraction of the minority (steeper upward-bending part of the U). A flat and insignificant relationship should appear in the middle range. Both regularities seem supported by the data. Fourth, as additional non-parametric evidence we have estimated

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[30]But likewise for the decades 1980, 2000.

the cross-sectional regression of Table (1) using dummies by quintile of the minority population. The coefficients on the dummies first decrease and then increase (at the fifth quintile) as expected (however only the decreasing portion of the U curve produces statistically significant contrasts).

4.2 Before the VRA

An important validation issue in the empirical strategy concerns the timing of the Voting Rights Act. We employ such date as an informative source of variation for institutional manipulation. Table 2 reproposes the specifications of columns (1) and (4) of Table 1 *before* the Voting Rights Act of 1965. The sample covers Southern cities before the VRA. Column (1) refers to the 1950 cross-section[31], Column (2) to the 1960 cross-section, and the panel analysis covers the period 1930-1960. Here the coefficients on the size of the minority and its square are statistically zero. Joint F-tests for the linear and quadratic terms of minority size present high p-values (0.376 for column (1) in panel (a)) and the coefficients display changes of sign. This is consistent with our hypothesis that before the Voting Act electoral rules were unaffected by the city racial composition, since racial minorities were almost completely disenfranchised.

4.3 The VRA

In this section we try to identify the effect of the extension of the electoral franchise in the immediate aftermath of the VRA on the choice of electoral rules from the subsequent legal restrictions imposed on the choice of the electoral rules. A way of addressing this issue is to make appropriate use of the timing of the voting rights lawsuits and Supreme Court jurisprudence. Accordingly, Table 3 focuses on the period around the VRA but *before the Supreme Court decision*[32] *of* 1969 (the early post-VRA sample). Our approach is to take the percent minority in 1960 and use it to predict the change in institutions between 1960 and 1967 (the closest ICMA survey available) in Southern cities, the ones more directly affected by the VRA. The drawback of focusing solely on the immediate post-VRA sample, however, is that only partial registration of the minorities had been accomplished before 1967 and full enfranchisement even of large minority groups was still uncertain and surely incomplete. We estimate the following specification:

$$\Delta SDshare_{i,1960-67} = \pi_{i,1960}\beta_1 + (\pi_{i,1960})^2 \beta_2 + \Delta X'_{i1960-67}\gamma + \Delta u_{i1960-67}. \tag{3}$$

The coefficients $\beta = (\beta_1, \beta_2)$ can be interpreted as a measure of the effect of an increase in the relative size of racial minorities in the South on the electoral rules.

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[31]Median household income is not available before 1960, hence it is not included in specifications covering those years.

[32]Allen vs. State Board of Election.

Estimates[33] of the gap between fractions of white and black registered voters decreased from 44.1 percent to 27.4 percent from 1965 to 1967, but with half the black population still disenfranchised. In a city with 50 percent blacks in 1967 only 25 percent was voting, leaving whites[34] 1.6 to 1. This means that our analysis will be particularly apt at capturing the effects at low π.

Table 3 presents the results. In the upper part of Table 3 we first report tabulations of all the within-city changes in electoral rules that identify (3). By splitting the sample by electoral rule in 1960 we are able to detect two relevant facts: (i) in 1960 the majority of the cites in the South were AL ($SDshare < .5$), a remnant of the Progressive era; (ii) the bulk of the changes happened in cities where $SDshare > .5$. Basically all Southern cities employing an AL rule kept it unchanged at the moment of the black enfranchisement and a vast majority of the SD cities moved towards at-large in a way consistent with intuition and our model. If a city moves from zero voting minority (where the electoral rule is inconsequential) to $\pi < \pi^*$, the only type of city that should change is the (initially) SD moving towards AL. The AL cities should not move unless π is very large. It is therefore not surprising that our results will be especially strong concerning the movement towards AL.

Column (1) in the bottom part of Table 3 presents first-difference estimates for the specification (3), where the fraction of the minority enters linearly at the 1960 level and in a quadratic form. The estimated coefficient β_1 presents the expected sign but not β_2, and both are not statistically significant. In column (2) we run the same regression in the portion of the data containing the identifying information: the initially SD cities. Importantly the regression picks up both the linear and the quadratic effects in a way consistent with the theory. Similarly to Section 4.1 we can calculate the effect of an increase of one standard deviation of minority sizes (0.153). The effects are -23.2 (at Q5) and $+4.1$ percent (at Q9) of the share of single-member seats. The negative effect is around four times larger than in Table (1), confirming substantial pressure towards endogenous changes in the electoral rules. In column (3) we restrict to the set of initially AL cities. Here identification is due to a very small fraction of cities, the few changing, and we find a counterintuitive swap in coefficients signs and borderline significance for the t-tests. Notice however that these findings are countervailed by lack of joint significance of π and π^2, a result consistent with the model. Reassuringly the F-test p-value does not warrant rejection at any standard confidence level.

It is also relevant to investigate how our results would change depending on the VRA coverage. In columns (4)-(6) we run the same specifications of columns (1)-(3) on the VRA-fully covered states with stronger results than in the overall South sample. Estimates especially differ on the

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[33]See Grofman, Handley, and Niemi (1992, p.23).

[34]Considering an average white registration rate around 80 percent (see Grofman, Handley, Niemi 1992, p. 23).

quantitative implications on the increasing part. Repeating our calculations, the two estimated effects are now -23.5 percent at Q5 and $+11$ percent at Q9 for the sample of cities initially SD. Again we detect individual but no joint significance of π and π^2 for the AL cities (the F-test p-value does not warrant rejection at any standard confidence level).

4.4   Minority representation

Our basic story holds that electoral rules affect the ratio of minorities elected differently. The representational ratio (RR) is the fraction of minority councilmen in a council divided by the fraction of the population that belongs to the minority and is available for our all-US cities sample in year 1980, 1990, and 2000[35]. We regress RR on our variable of interests, the single-district rule variable. Table 4 reports the results. The null hypothesis that the electoral rule adopted by a city has no association with the representational ratio is soundly rejected in both a 1990 cross-sectional regressions (Panel a, column 1) and in fixed-effect regressions in which time invariant city-specific unobserved heterogeneity is accounted for (Panel b, column 1)[36]. Single-district rules substantially increase the chance of minorities to be proportionally represented at the municipal level. Recalling that the fraction of single-district seats, $SDshare$, is defined over the $[0, 1]$ interval, our results in column (1) imply an average increase in the RR of the city council between 8.2 (in panel a) and 21.6 (in panel b) percent from switching from a fully at-large rule to a fully single-district rule. This is a quantitatively substantial effect: each black or minority vote has more than 1/5 more weight in terms of electoral representation under single-district than under at-large elections[37]. Finally, let us note that the correlations presented in column (1) identify the effect of the electoral rule on the representational ratio without the strong exclusion restriction that the fraction of the minority has an independent effect on RR.

In columns (2)-(4) we provide evidence that the impact of the single-district rule on the representational ratio is actually non-monotonic in the size of the minority by looking at the effect of the single-district variable at different levels of π. As discussed above our model implies that the sign of the coefficient should be the highest in intermediate ranges of π and the lowest when the

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[35] Very few cities for the all US sample present representational ratios of minorities of more than 1, indicating over-proportional representation. Even less of them are present in the South. In order to limit the role of these outliers we limit the representational ratio to be smaller than 5.

[36] All panel specifications include year fixed effects and a set of standard controls for city size (log population) and income levels (log household median income in 1990 dollars) and we apply the same clustering as Table 1.

[37] Focusing on the South produces even stronger estimates, in a range of 1/3. Sass and Pittman (2000) also provide panel data evidence on the effect of electoral rule on minority representation reporting a representational ratio differential of 36 percent, larger but comparable with our estimates. Our results extend to more recent data and a substantially larger sample of cities.

fraction of the minority is either very small or very large. The three ranges we employ are: (i) below the mean of π;[38] between the mean and the minimum, π^*, of the U computed in Table 1 (column 1 for the cross-section and 4 for the panel); and above π^*. The effect of single-district is quantitatively always stronger at intermediate ranges. A similar picture arises in the fixed effect analysis of panel (b). Notice that the effect of $SDshare$ is consistently significant and large in both the cross-section and the panel only at intermediate ranges of π. The results are influenced by the choice of the thresholds, but the decreasing effect of $SDshare$ seems to be a robust feature of the data.

5 Conclusions

This paper studies the problem of minority representation in political systems where majorities can strategically manipulate electoral rules. Empirical validation of this approach comes from the experience of cities in the United States before and after the Voting Rights Act of 1965.

Before the Voting Rights Act, racial minorities were essentially disenfranchised in the US South. Therefore, the type of electoral institutions were irrelevant in determining the level of control of the white majority: a level of control that was almost absolute. The Voting Rights Act allowed racial minorities to enter into the political arena. The white majorities reacted, within the legal boundaries of the Voting Rights Act, by changing electoral rules as to minimize expected minority influence. This evidence suggests how institutions (in this case electoral rules) evolve even rather quickly in response to changes in the environment and raises questions about empirical evidence that holds electoral institutions as exogenous.

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[38]The mean π for the 1990 sample is 0.125 and for the panel is 0.130.

References

[1] Acemoglu, Daron and James Robinson (2006) *Economics Origins of Dictatorship and Democracy* (Cambridge University press, New York).

[2] Aghion, Philippe, Alberto Alesina, and Francesco Trebbi (2004) "Endogenous Political Institutions" *Quarterly Journal of Economics,* 119, May, 565- 612.

[3] Aghion, Philippe and Patrick Bolton (2003) "Incomplete Social Contracts" *Journal of the European Economic Association,*1, 38-67.

[4] Alesina, Alberto, Reza Baqir, and Caroline Hoxby (2004) "Political Jurisdictions in Heterogeneous Communities" *Journal of Political Economy,* 112, April, 348-396.

[5] Alesina, Alberto and Edward Glaeser (2004) *Fighting Poverty in the US and Europe: A World of Difference* (Oxford University Press, Oxford, UK).

[6] Alesina, Alberto and Howard Rosenthal (1995) *Partisan Politics, Divided Government, and the Economy* (Cambridge University press, Cambridge, UK).

[7] Alexander, Gerard (2004) "France: Reform-mongering between Majority Runoff and Proportionality", in *Handbook of Electoral System Choice*, by Josep M. Colomer (ed.) (Palgrave MacMillan, New York, N.Y.)

[8] Alt, James E. and Robert C. Lowry (1994) "Divided Government, Fiscal Institutions and Budget Deficits: Evidence from the States" *American Political Science Review, 89,* December, 811-828.

[9] Amy, Douglas J. (2002, second edition) *Real Choices / New Voices: The Case for Proportional Representation Elections in the United States (*Columbia University Press, New York, NY).

[10] Arellano, Manuel and Stephen Bond (1991) "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations" *Review of Economics Studies*, 58, January, 277-297.

[11] Baqir, Reza (2002) "Districting and Government Overspending" *Journal of Political Economy,* 110, December, 1318-1354.

[12] Bohn, Henning and Robert P. Inman (1996) "Balanced Budget Rules and Public Deficits: Evidence from US States" *Carnegie Rochester Conference on Public Policies, 13-76.*

[13] Buchanan, James M. and Gordon Tullock (1962) *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (University of Michigan Press, Ann Arbor, MI).

[14] Cameron, Charles, David Epstein, and Sharyn O'Halloran (1996) "Do Majority-Minority Districts Maximize Substantive Black Representation in Congress?" *American Political Science Review*, 90, 4, December, 794-812.

[15] Cole, Leonard A. (1976) *Blacks in Power: A Comparative Study of Black and White Elected Officials* (Princeton University Press, Princeton, NJ).

[16] Colomer, Josep M. (2004) *Handbook of Electoral System Choice*, (Palgrave MacMillan, New York, N.Y.)

[17] Cox, Gary W. and Johnatan N. Katz (2002) *Elbridge Gerry's Salamander* (Cambridge University press, Cambridge, UK).

[18] Cutler, David, Edward Glaeser, and Jacob Vigdor (1999) "The Rise and Decline of the American Ghetto", *Journal of Political Economy,* 107, June, 455-506.

[19] DeSantis, Victor and Tari Renner "Minority and Gender Representation In American County Legislatures: The Effect of Election Systems" in Rule, Wilma and Joseph F. Zimmerman (eds.) (1992) *United States Electoral Systems* (Greenwood Press, New York, US).

[20] Epple, Dennis and Thomas Romer (1991) "Mobility and Redistribution" *Journal of Political Economy*, 99, August, 828-858.

[21] Friedman, John N. and Richard Holden (2005) "Towards a Theory of Optimal Partisan Gerrymandering" Mimeograph, Harvard University.

[22] Grofman, Bernard, Lisa Handley, and Richard Niemi (1992) *Minority Representation and the Quest for Voting Equality* (Cambridge University Press, New York, NY).

[23] Grofman B. and C. Davidson (1992) *Controversies in Minority Voting Borrikings Institution Washington DC*

[24] Hacker, Andrew (1992) *Two nations: Black and White, Separate, Hostile, Unequal* (Scribner's, New York, US).

[25] Hayek, Friedrich A. (1960) *The Constitution of Liberty* (University of Chicago Press, Chicago, Ill).

[26] Huckfeld, Robert, and Carol Weitzel Kohfeld (1989) *Race and the Decline of Class in American Politics* (University of Illinois Press, Urbana, Ill).

[27] Karning, Albert K. and Susan Welch (1982) "Electoral Structure and Black Representation on City Councils" *Social Science Quarterly, 63,* March, *99-114.*

[28] Kousser, Morgan J. (1999) *Color-blind Injustice: Minority Voting Rights and the Undoing of the Second Reconstruction* (University of North Carolina Press, Chapel Hill, NC).

[29] Kreuzer, Marcus (2004) "Germany: Partisan Engineering of Personalized Proportional Representation", in *Handbook of Electoral System Choice*, by Josep M. Colomer (ed.) (Palgrave MacMillan, New York, N.Y.)

[30] Laffont, Jean-Jacques (2000) *Incentives and Political Economy* (Oxford University Press, New York, NY).

[31] Lijphart, Arend (1994) *Electoral Systems and Party Systems: a Study of 27 Democracies* (Oxford University Press, New York, NY).

[32] Lipset, Seymour .M. and Rokkan, Stein (1967) *Party Systems and Voter Alignments.* New York: Free Press.

[33] Mulligan, Casey B., Richard Gil, and Xavier Sala-i-Martin (2004) "Do Democracies Have Different Public Policies than Nondemocracies?" *Journal of Economic Perspectives, 18,* winter, *51-74.*

[34] Pande, Rohini (2003) "Can Mandate Political Representation Increase Policy Influence for Disadvantaged Minorities? Theory and Evidence from India" *American Economic Review, 93, 1132-1151.*

[35] Parker F. (1990) *Black Votes Count: Poltical Empowerement in Mississipi After 1965 University of North carolina press, Chapell Hill NC*

[36] Persson, Torsten and Guido Tabellini (2003) *The Economics Effects of Constitutions* (MIT Press, Cambridge, MA).

[37] Poterba, James M. (1994) "State Response on Fiscal Crises: The Effects of Budgetary Institutions on Policies", *Journal of Political Economy, 102,* August, *799-821.*

[38] Riker, William (1986) *The Art of Political Manipulation* (Yale University Press, New Haven, CT).

[39] Sass, Tim R. and Bobby J. Pittman (2000) "The Changing Impact of Electoral Structure on Black Representation in the South, 1970-1996" *Public Choice, 104, 3-4,* September, *369-388.*

[40] Strumpf, S. Koleman and Felix Oberholzer-Gee (2002) "Endogenous Policy Decentralization: Testing the Central Tenet of Economic Federalism" *Journal of Political Economy*, 110, February, 1-36.

[41] Voigt, Stefan (1997) "Positive Constitutional Economics: A Survey" *Public Choice, 90,* March, *11-53.*

[42] Wilson,William J. (1996) *When Work Disappear: The World of the New Urban Poor* (Knopf, New York, NY)

6 Appendix: Proofs of Propositions

Proof of Proposition 1

Part (a) is straightforward. For part (b) consider that:

$$L_W^{AL} = 0 < L_W^{SD} \text{ if } \pi \in \left(\frac{1}{3} - \frac{\overline{\alpha}}{6}, \frac{1}{2} - \frac{\overline{\alpha}}{6} \right);$$

and L_W^{AL} and L_W^{SD} are both linear increasing in π for $\pi \in \left(\frac{1}{2} - \frac{\overline{\alpha}}{6}, \frac{1}{3} \right)$. At $\pi = \frac{1}{3}$, we may have two cases. Case 1: it holds that

$$L_W^{AL} = \left(1 - \frac{1}{\overline{\alpha}} \right) \Delta > L_W^{SD} = \delta$$

and hence the existence of a unique cut-off $\widehat{\pi} \in \left(\frac{1}{2} - \frac{\overline{\alpha}}{6}, \frac{1}{3} \right)$ with the desired properties. Case 2:

$$\Delta \left(1 - \frac{1}{\overline{\alpha}} \right) \le \delta \text{ and } \Delta > \delta.$$

For $\pi \in \left(\frac{1}{3}, \frac{1}{2} \right)$ the loss L_W^{AL} is linear increasing in π and L_W^{SD} is constant at δ. Hence the existence of a unique cut-off $\widehat{\pi} \in \left(\frac{1}{3}, \frac{1}{2} \right)$ in this case. Finally, to establish part (c) consider that for any π between 0 and $\frac{1}{2}$, we have:

$$L_W^{SD} \ge L_W^{AL}$$

since here $\Delta = \delta$ and

$$\left(1 - \frac{2}{\overline{\alpha}} (1 - 3\pi)^+ \right)^+ \ge \left(1 - \frac{3}{\overline{\alpha}} (1 - 2\pi) \right)^+. \tag{4}$$

At $\pi = \frac{1}{2}$ (4) holds with equality. This establishes the proposition.

Proof of Proposition 2

Define $N_1/N = n_1$ and $\rho = N_{TOT}/N$. Normalize $u(0) = 0$. The expected utility of a pure AL is:

$$U_W^{AL} = \Pr(\alpha < X) u(1),$$

where $X(\pi) = N(1 - 2\pi)$.

The probability under a single-member district system of winning type-2 districts $1, 2, ..., N_2$ for W is:

$$\Pr \left(\alpha < \frac{(1 - 2\pi N/N_2)}{f} \right)$$

With constant $f = 1/N_2$ indicate $Y(\pi) = \frac{(1 - 2\pi N/N_2)^+}{f} = (N_2 - 2\pi N)^+$. Then the expected utility of pure SD for given π is:

$$U_W^{SD} = \Pr(\alpha > Y) u(n_1) + \Pr(\alpha < Y) u(1).$$

Notice that $X(\pi) > Y(\pi), \forall \pi$.

Consider the value of π^* at which the expected share of seats won by W is the same under pure AL and pure SD. For any $\pi < \pi^*$, AL is actuarially more favorable than SD. If W is risk averse, the $\hat{\pi}$ at which $U_W^{SD} = U_W^{AL}$ lays in the interval $\left(\pi_0^{AL}, \pi^*\right)$, since AL is a riskier electoral rule. A unique point $\hat{\pi}$ always exists as shown in the text. It follows that

$$
\begin{aligned}
U_W^{SD} &= U_W^{AL} \\
&\Longrightarrow \ \Pr(\alpha > Y) = \Pr(Y < \alpha < X)\frac{u(1)}{u(n_1)},
\end{aligned}
\tag{5}
$$

where

$$
\begin{aligned}
\Pr(\alpha \ > \ Y) &= 1 - (N_2 - 2\pi N)^+ / \overline{\alpha} \\
\Pr(Y \ < \ \alpha < X) &= N_1 / \overline{\alpha}
\end{aligned}
$$

Hence (5) implies that at $\hat{\pi}$:

$$
\frac{u(1)}{u(n_1)} = \frac{\overline{\alpha}}{N_1} - \frac{1}{N_1}\left(N_2 - 2\hat{\pi}N\right)^+ < \frac{\overline{\alpha}}{N_1} < \frac{N}{N_1}
\tag{6}
$$

A risk averse W will always accept at least a small amount of risk that is actuarially favorable. Therefore, at $\hat{\pi}$ W will prefer a mixed system to a pure SD rule.

To see this, define the number of SD councilmen per district $\underline{\rho}$ and consider the problem of W for $\pi = \hat{\pi}$:

$$
\max_{\underline{\rho}} \left\{U_W^{MX}(\underline{\rho})\right\}
$$

subject to $0 \leq \underline{\rho} \leq \rho$.

The expected utility of a mixed system MX for given π is:

$$
\begin{aligned}
U_W^{MX} &= \Pr(\alpha > X)u(\underline{\rho}n_1/\rho) + \Pr(Y < \alpha < X)u\left(\left(\underline{\rho}n_1 + \rho - \underline{\rho}\right)/\rho\right) \\
&\quad + \Pr(\alpha < Y)u(1)
\end{aligned}
\tag{7}
$$

By using the expression in (7) and allowing $\underline{\rho}$ to take continuous values the FOC for the problem is:

$$
\Phi(\underline{\rho}) = \frac{1}{\rho}\left[n_1\Pr(\alpha > X)u'(\underline{\rho}n_1/\rho) - (1 - n_1)\Pr(Y < \alpha < X)u'\left(\left(\underline{\rho}n_1 + \rho - \underline{\rho}\right)/\rho\right)\right].
$$

Consider $\Phi(\underline{\rho})$ at $\pi = \hat{\pi}$:

$$
\begin{aligned}
\Phi(\underline{\rho}) &= \frac{\Pr(Y < \alpha < X)}{\rho N} * \\
&\quad \left[N_1\left(\frac{u(1)}{u(n_1)} - 1\right)u'(\underline{\rho}n_1/\rho) - N_2 u'\left(\left(\underline{\rho}n_1 + \rho - \underline{\rho}\right)/\rho\right)\right].
\end{aligned}
\tag{8}
$$

where we use the fact that $\Pr(\alpha > X) = \Pr(\alpha > Y) - \Pr(Y < \alpha < X)$ and condition (5). We are interested in evaluating (8) at $\underline{\rho} = \rho$:

$$\Phi(\underline{\rho} = \rho) = \frac{\Pr(Y < \alpha < X)}{\rho N} u'(n_1) \left[N_1 \left(\frac{u(1)}{u(n_1)} - 1 \right) - N_2 \right]. \tag{9}$$

By replacing in (9) the expression in (6) we can see that the FOC is strictly negative at $\underline{\rho} = \rho$. This is because the element in brackets in (9) is strictly negative by (6):

$$N_1 \frac{u(1)}{u(n_1)} - N < 0.$$

This excludes that W will choose a pure SD system. Since at $\hat{\pi}$ U_W^{SD} is not the optimum and $U_W^{SD} = U_W^{AL}$, then a pure AL rule cannot be an optimum either. This implies W will choose a mixed system with $\underline{\rho} \neq 0$, $\underline{\rho} \neq \rho$. Finally, by continuity in a neighborhood (π_3, π_4) of $\hat{\pi}$ the same must hold.

This establishes the proposition.

Figure 1

Expected loss under different electoral rules as function of π

Figure 2

Choice of SD seats share as function of π

Figure 3

Expected utility under different electoral rules as function of π

Expected Utility

Size of minority
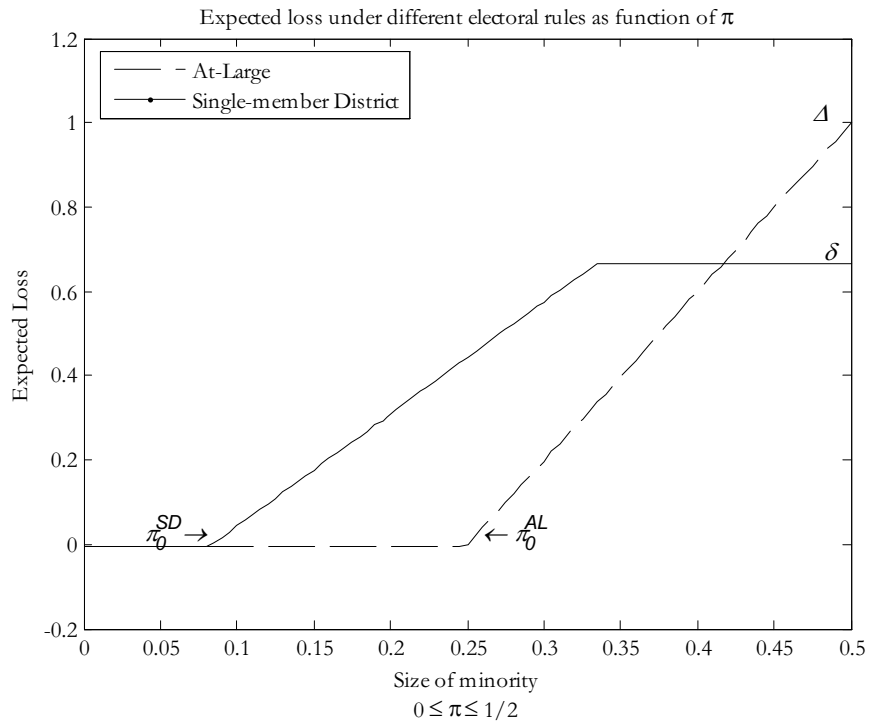$0 \leq \pi \leq 1/2$

Mixed system
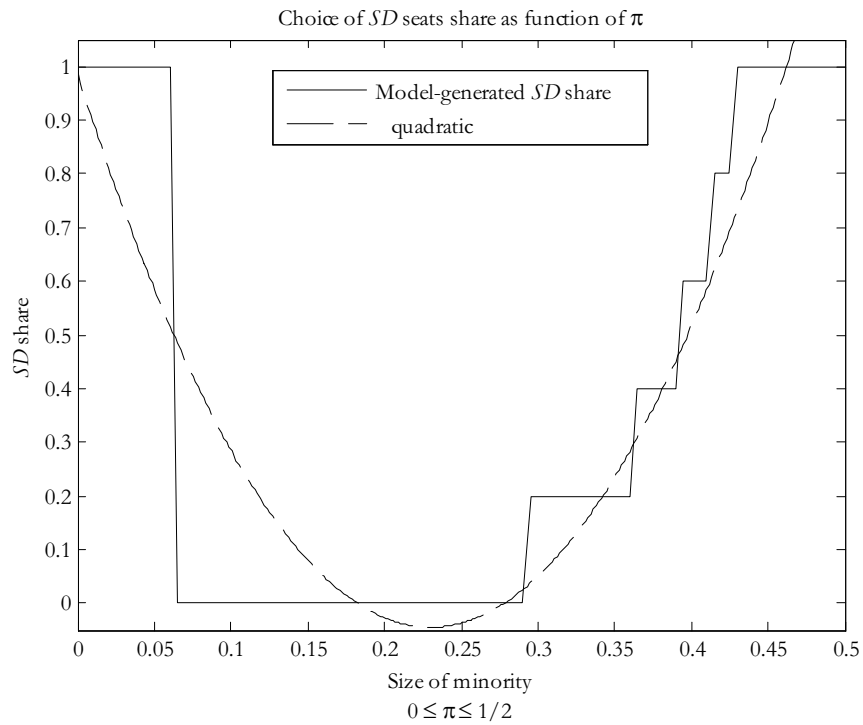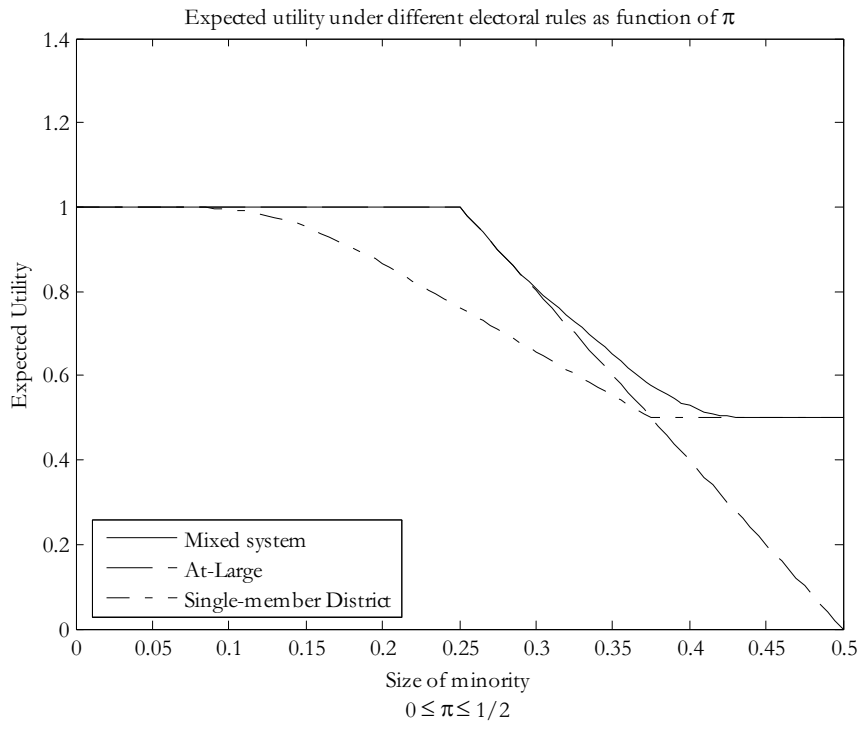At-Large
Single-member District

Table 1
Size of Minority and City Electoral Rule: Main Non-Monotonicity, All U.S.

Dependent variable:	Fraction of councilmen elected by district				
Sample period:	Cross-section 1990	Cross-section 1990	Cross-section 1990	Panel 1970-2000	Panel 1970-2000
Estimator:	OLS	OLS	2SLS	City F. E.	City F. E.
	(1)	(2)	(3)	(4)	(5)
Frac. Minority	-0.360	-0.292	-0.645	-0.622	-0.697
	[0.115]***	[0.118]**	[0.191]***	[0.202]***	[0.203]***
(Frac. Minority)^2	0.410	0.375	1.011	1.078	1.114
	[0.189]**	[0.190]**	[0.356]***	[0.284]***	[0.284]***
Log(City Population)	0.062	0.105	0.064	0.021	-0.750
	[0.007]***	[0.091]	[0.008]***	[0.027]	[0.229]***
Log(Median Income)	-0.237	-0.078	-0.253	-0.010	2.081
	[0.015]***	[0.530]	[0.019]***	[0.048]	[0.911]**
Controls		Included			Included
Observations	3601	3601	2491	11485	11485
R-squared	0.06	0.07	0.07	0.84	0.84
Minimum of U-function (π^*)	0.438	0.388	0.318	0.288	0.312
Observations $\pi > \pi^*$	198	288	280	1678	1462
No relation F-test (p-value)	0.002	0.041	0.002	0.000	0.000

Notes: Robust standard errors in brackets below coefficients. * significant at 10%; ** significant at 5%; *** significant at 1%. In panel (a) and (b) standard errors are clustered at the city level for columns (4) and (5). Regressions of columns (4) and (5) include year fixed effects. No relation F-test refers to the joint test for the null hypothesis that Frac. Minority and Frac. Minority squared are zero. For column (2) controls are: the squared log of city population and income, the fraction of population employed in manufacturing, agricolture, mining, trade, financial services, and fraction above 65 years of age. For column (3) the instruments set includes t-10 lags of frac. minority and its square and an indicator variable for Southern cities. For column (5) controls are the squared log of city population and income.

Table 2
Pre-VRA in the South: Validation tests

Dependent variable:	*Fraction of councilmen elected by district*		
Sample period:	Cross-section 1950	Cross-section 1960	Panel 1930-1960
Estimator:	OLS	OLS	City F. E.
	(1)	(2)	(3)
Frac. Minority	0.308	0.226	0.406
	[0.413]	[0.358]	[0.841]
(Frac. Minority)^2	-0.852	-0.478	-0.661
	[0.776]	[0.744]	[1.322]
Log(City Population)	-0.045	-0.015	0.001
	[0.021]**	[0.017]	[0.042]
Log(Median Income)		-0.145	
		[0.058]**	
Observations	486	652	1482
R-squared	0.01	0.02	0.81
No relation F-test (p-value)	0.376	0.811	0.882

Notes: Robust standard errors in brackets below coefficients. * significant at 10%; ** significant at 5%; *** significant at 1%. In panel (a) and (b) standard errors are clustered at the city level for column (3). Regressions of column (3) include year fixed effects. No relation F-test refers to the joint test for the null hypothesis that Frac. Minority and Frac. Minority squared are zero.

Table 3
Post-VRA reaction to minority enfranchisement and the selection of electoral rules in the South before Allen v. State Board of Elections (1969)

	All South	*Tabulation of changes in electoral rules 1960-67*				
		SDshare 1960 > 0.5 (SD)	SDshare 1960 < 0.5 (AL)	*VRA-Covered*	SDshare 1960 > 0.5 (SD)	SDshare 1960 < 0.5 (AL)
Δ(SDshare 1960-67) > 0		17	4		6	15
Δ(SDshare 1960-67) = 0		54	398		22	252
Δ(SDshare 1960-67) < 0		90	34		39	2
Tot.	597	161	436	336	67	269

Dependent variable:	*Within-city change in the fraction of councilmen elected by district between 1960 - 1967*					
Sample period:	1960-67	1960-67	1960-67	1960-67	1960-67	1960-67
	All South	SDshare 1960 > 0.5 (SD)	SDshare 1960 < 0.5 (AL)	*VRA-Covered*	SDshare 1960 > 0.5 (SD)	SDshare 1960 < 0.5 (AL)
Estimator:	First Diff.	First Diff.	First Diff.	First Diff.	First Diff.	First Diff.
	(1)	(2)	(3)	(4)	(5)	(6)
Frac. Minority 1960	-0.143	-2.335	0.433	-0.146	-2.560	0.457
	[0.353]	[0.739]***	[0.239]*	[0.363]	[0.977]**	[0.235]*
(Frac. Minority 1960)^2	-0.125	3.104	-0.940	-0.100	3.905	-0.911
	[0.775]	[1.487]**	[0.480]*	[0.758]	[1.804]**	[0.457]**
ΔLog(City Pop.) 1960-67	0.167	-0.027	0.138	0.194	0.548	0.151
	[0.075]**	[0.151]	[0.064]**	[0.068]***	[0.474]	[0.057]***
ΔLog(Med. Inc.) 1960-67	-0.113	-0.301	0.034	-0.071	-0.317	0.000
	[0.065]*	[0.156]*	[0.049]	[0.067]	[0.237]	[0.038]
No relation F-test (p-value)	0.279	0.001	0.148	0.355	0.032	0.138
Observations	1551	345	1206	838	141	697
R-squared	0.79	0.69	0.79	0.76	0.67	0.74
Tot. No. Changers	592			332		

Notes: The date of the VRA is 1965. Robust standard errors in brackets below coefficients. * significant at 10%; ** significant at 5%; *** significant at 1%. Columns (1)-(3) employ sample of all Southern cities; (4)-(6) only cities in VRA-covered States. In these first difference specification frac. minority and its square enter in 1960 levels in order to proxy for the extension of the franchise to minorities.

Table 4
City Electoral Rule and Minority Representation: Cross-sectional and Within-city variation

Sample:	All U.S.	Frac. Minority < mean(Frac. Minority)	mean(Frac. Minority) < Frac. Minority < π^*	π^* < Frac. Minority
	Panel (a): OLS, cross-section 1990			
	Dependent variable: Representaional ratio			
	(1)	(2)	(3)	(4)
SD Share	0.082	0.081	0.146	0.088
	[0.031]***	[0.038]**	[0.057]**	[0.059]
Log(City Population)	0.072	0.036	0.051	0.053
	[0.011]***	[0.018]**	[0.017]***	[0.021]**
Log(Median Income)	-0.208	-0.092	-0.507	-0.202
	[0.033]***	[0.035]***	[0.081]***	[0.073]***
Frac. Minority	1.127	3.821	0.156	0.833
	[0.057]***	[0.426]***	[0.239]	[0.177]***
Observations	3507	2375	934	198
R-squared	0.13	0.06	0.10	0.13
	Panel (b): City Fixed Effects, panel 1980-2000			
	Dependent variable: Representaional ratio			
	(1)	(2)	(3)	(4)
SD Share	0.216	0.027	0.433	0.296
	[0.058]***	[0.102]	[0.193]**	[0.092]***
Log(City Population)	0.087	0.188	-0.131	-0.028
	[0.080]	[0.115]	[0.288]	[0.132]
Log(Median Income)	-0.017	-0.043	0.269	-0.163
	[0.120]	[0.150]	[0.518]	[0.264]
Frac. Minority	-0.248	-0.359	-0.858	-0.272
	[0.227]	[1.105]	[1.678]	[0.472]
Observations	10252	6874	1925	1453
R-squared	0.71	0.67	0.87	0.87

Notes: Robust standard errors are in brackets below coefficients. * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are clustered at the city level in Panel (b). In Panel (b) all regressions include year fixed effects and sample coverage period is 1980-2000. The representational ratio is the fraction of non-white councilmen in the council divided by the fraction of the population that is non-white.

Table AI

		Summary Statistics (All U.S. sample, excl. South)					Summary Statistics (All U.S. sample, incl. South)				
year		Single District	Form of Gov.nt	Fract. Minority	Population	Median Household Income	Single District	Form of Gov.nt	Fract. Minority	Population	Median Household Income
1980	mean	0.26	0.37	0.07	22787.53	22809.20	0.24	0.38	0.10	22559.6	21573.12
	st. dev.	0.41	0.68	0.11	142177.4	8163.66	0.40	0.65	0.14	127573.8	7987.24
	min.	0.00	-1.00	0.00	161	8347.09	0.00	-1.00	0.00	113	6479.37
	max.	1.00	1.00	0.96	7071638	91020.62	1.00	1.00	1.00	7071638	91020.62
	N. obs.	2870	3176	3151	3176	3176	3943	4338	4297	4338	4338
1990	mean	0.22	0.35	0.09	20925.98	25754.26	0.22	0.37	0.12	20816.74	23949.99
	st. dev.	0.38	0.66	0.13	75066.69	11934.09	0.38	0.63	0.15	69684.18	11484.99
	min.	0.00	-1.00	0.00	107	6783.47	0.00	-1.00	0.00	107	5696.25
	max.	1.00	1.00	0.99	3485398	114767.40	1.00	1.00	0.99	3485398	114767.40
	N. obs.	2904	3476	3455	3476	3476	3976	4814	4754	4814	4814
2000	mean	0.28	0.28	0.13	22625.3	27690.47	0.29	0.29	0.16	23113.37	26127.72
	st. dev.	0.41	0.66	0.15	83089.34	12362.81	0.41	0.62	0.17	84880.19	12285.10
	min.	0.00	-1.00	0.00	124	8470.96	0.00	-1.00	0.00	124	8309.53
	max.	1.00	1.00	0.98	3694834	116144.60	1.00	1.00	0.99	3694834	116144.60
	N. obs.	2671	2984	2984	2984	2984	3681	4097	4097	4097	4097
Total	mean	0.25	0.33	0.09	22065.77	25383.17	0.25	0.35	0.12	22097.58	23845.18
	st. dev.	0.40	0.67	0.13	104075.6	11159.28	0.40	0.63	0.16	96543.37	10898.35
	min.	0.00	-1.00	0.00	107	6783.47	0.00	-1.00	0.00	107	5696.25
	max.	1.00	1.00	0.99	7071638	116144.60	1.00	1.00	1.00	7071638	116144.60
	N. obs.	8445	9636	9590	9636	9636	11600	13249	13148	13249	13249

Table AII

Summary Statistics: South Region

year		Single District	Form of Government	Fract. Minority	Population
1930	mean	0.1901865	0.6144578	0.240152	55689.73
	st. dev.	0.3417885	0.6756604	0.1527653	97710.1
	min.	0	-1	0.00094	284.928
	max.	0.9473684	1	0.9616204	804874.1
	N. obs.	144	166	137	137
1940	mean	0.3677645	0.2313253	0.2214527	44127.13
	st. dev.	0.4594916	0.7952042	0.1455125	85805.16
	min.	0	-1	0.0002387	4868
	max.	1	1	0.5976929	859100.3
	N. obs.	415	415	229	229
1950	mean	0.3452313	0.254065	0.2088538	32005.15
	st. dev.	0.4523494	0.7459898	0.1448257	73305.76
	min.	0	-1	0.0001114	2774
	max.	1	1	0.7235112	949708.4
	N. obs.	486	492	492	492
1960	mean	0.2539517	0.2642643	0.1941368	34242.28
	st. dev.	0.4137504	0.6755555	0.1454932	82867.91
	min.	0	-1	0	3202.001
	max.	1	1	0.6946776	939023.6
	N. obs.	656	666	663	663
1970	mean	0.1613318	0.2837259	0.1779699	29274.97
	st. dev.	0.3543261	0.5554105	0.150278	79091.1
	min.	0	-1	0	2406
	max.	1	1	0.7703364	1199388
	N. obs.	904	934	936	936
1980	mean	0.1721898	0.4061962	0.1825356	21936.64
	st. dev.	0.3517008	0.536582	0.1646552	74266.77
	min.	0	-1	0	113
	max.	1	1	0.9988168	1595138
	N. obs.	1073	1162	1146	1162
1990	mean	0.2301296	0.3983558	0.2088375	20532.95
	st. dev.	0.3838137	0.5150512	0.1756844	53238.92
	min.	0	-1	0	243
	max.	1	1	0.9864677	935926.6
	N. obs.	1072	1338	1299	1338
2000	mean	0.318919	0.3225517	0.2462236	24421.92
	st. dev.	0.4229846	0.5082095	0.1855629	89530.48
	min.	0	-1	0	138
	max.	1	1	0.9933691	1954847
	N. obs.	1010	1113	1113	1113
Total	mean	0.2454504	0.3385301	0.2055153	26973.67
	st. dev.	0.4016687	0.5937366	0.1662955	76418.88
	min.	0	-1	0	113
	max.	1	1	0.9988168	1954847
	N. obs.	5760	6286	6015	6070