RACISM AND REDISTRIBUTION IN THE UNITED STATES: A SOLUTION TO THE PROBLEM OF AMERICAN EXCEPTIONALISM

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A SOLUTION TO THE PROBLEM OF AMERICAN EXCEPTIONALISM

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Abstract

The two main political parties in the United States put forth policies on redistribution and on issues pertaining directly to race. We argue that redistributive politics in America can be fully understood only by taking account of the interconnection between these issues, and the effects of political competition upon the multi-dimensional party platforms. We identify two mechanisms through which racism among American voters decreases the degree of redistribution that would otherwise obtain. Many authors have suggested that voter racism decreases the degree of redistribution due to an *anti-solidarity effect*: that (some) voters oppose government transfer payments to minorities whom they view as undeserving. We point to a second effect as well: that some voters who desire redistribution nevertheless vote for the anti-redistributive party (the Republicans) because that party's position on the race issue is more consonant with their own, and this, too, decreases the degree of redistribution. We call this the *policy bundle effect.* The effect of voter racism on redistribution is the sum of these two effects. We propose a formal model of multi-dimensional political competition that enables us to estimate the magnitude of these two effects, and estimate the model for the period 1976-1992. We numerically compute that during this period voter racism reduced the income tax rate by 11-18 percentage points; the total effect decomposes about equally into the two sub-effects. We also find that the Democratic vote share is 5-38 percentage points lower than it would have been, absent racism.

JEL Categories: D3, D7, H2

Keywords: Racism, redistribution, anti-solidarity effect, policy bundle effect, party unanimity Nash equilibrium, endogenous parties

1. Introduction

It is an old theme of the Left that racism divides the American working class, thus blocking its attempt to redistribute national income away from capital towards labor. (See McWilliams (1939) for a classical study of how growers used racism to prevent farm labor from organizing.) Traditionally, the mechanism indicated has been that racism among workers weakens unions, which shifts revenues of firms towards profits and away from wages. A second mechanism, of more social democratic origins, operates through electoral politics. Racism reduces 'compassion' among citizens – particularly, in the United States, among whites towards blacks; some whites consequently vote against the redistributive party (the Democrats in the US), as blacks are prominent beneficiaries of redistributive taxation.

A renewed interest in the significance of voter racism is emerging among scholars. Alesina et al. (2001) regress, for a panel of countries, the degree of redistribution on the size of the country's poor ethnic minority, and find a strong negative relationship. The US has the most significant, poor minority of any country in the panel, and the least redistribution. Luttmer (2001) concludes similarly: individuals decrease their support for redistribution as the share of local recipients from their own racial group falls. He finds that this effect is stronger if those on welfare are predominantly not working, or unmarried mothers.

Purely econometric exercises do not identify mechanisms; there could be many causes for the observed phenomenon. These authors conjecture they are capturing an effect in which citizens vote against redistribution because they place a low value on equality, due to their wish not to redistribute to minorities. There is, however, a second effect, quite different from this one, which may also be at play. Political parties put forth policies on many issues – in particular, on redistribution *and* on racial issues. (The latter include policies on affirmative action, government aid to blacks, 'law and order,' prison funding, and so on.) Racially conservative citizens who *desire* redistribution, because they themselves are poor, may vote for the Republican Party, because it has the policy they prefer on the race issue, even though it also advocates less redistribution than these voters would like.

Here, we will attempt to measure these two effects of voter racism on redistribution, which we call the *anti-solidarity* and *policy bundle effects*. Due to the anti-solidarity effect, racist voters oppose redistribution to the poor, who (they believe) are substantially minority. By reducing voter compassion towards the poor, the anti-solidarity effect will cause both American political parties to be less redistributive than otherwise. Due to the policy bundle effect, some poor citizens may vote for the party that is anti-redistributive, even if they themselves desire some redistribution, because that party advocates a position on the racial issue consonant with their own. The policy bundle effect may further reduce redistribution.[1]

We denote by *voter racism* an affirmation of what are conventionally viewed as conservative policies on the race issue, induced by *anti-black affect* and *the belief that blacks are pushing too fast*. (See section 2.) This is not the old-fashioned, blatant Jim Crow racism. We leave open the question of *why* the voter in question has the affect and the belief he/she does.

The policy bundle effect to which we refer may be large because there is no third party in the United States that offers voters a platform of significant redistribution *and* racially conservative policy: if there were, then poor racist voters desiring redistribution could vote for it, instead of voting Republican. The policy bundle effect is a *political portfolio effect*: it exists because of the limited choice of policy combinations available to the voter in a system with only two parties. The disappeared southern

[1] We point out, however, that the policy bundle effect of racism on redistribution is not always negative. Conceivably, if there were a large group of rich, anti-racist voters, the policy bundle effect could be positive. As we will see, this is not the case in the United States.

Democrats represented the platform just described; when these racist politicians were Democrats, Southern whites could vote Democratic (pro-redistribution) *and* be racially conservative at once. The policy bundle effect, we conjecture, was either nil or small during this period. One may conjecture that the demise of the Southern racist Democrat has reduced redistribution in the US – a conjecture we might be interested in testing at another time.

Some methodological comments are in order. The current paper combines theory with econometrics. Unlike Alesina et al. (2001) and Luttmer (2001), we will propose a formal model of political competition between parties. We will assume that the competition between the Democratic and Republican parties in the US is described by that model. The model's parameters and their confidence intervals will, however, be estimated from data. With the benchmark model and the estimated model parameters in hand, we will then perform some counterfactual experiments enabling us to compute the magnitude of the two effects of voter racism on redistribution. Sensitivity analyses and model confirmation procedures with actual data will be also employed.

In the jargon of econometrics, our approach is *semi-parametric*, which means two things: first, that we estimate those parameters that appear in the functions explicitly specified in the model using parametric estimation methods; second, that other functional forms, for which economic and political theory provide little guidance, are estimated non-parametrically. (An example of the latter would be the distribution of voter types.) Our use of non-parametrically estimated density functions in the computation of the model is computationally expensive, but greatly improves the model's fit.

Section 2 presents our operational definition of voter racism. Section 3 describes our micro-political model, one of political competition on a two-dimensional policy space where the constituencies of parties are endogenously determined. In section 4, we estimate the values of the underlying parameters as well as the distribution of voter types. In section 5, we calculate the equilibrium platforms of the two parties using the model described in section 3, with parameter values and functions estimated in section 4, and decompose the total effect of voter racism on redistribution into its two separate effects. Section 6 concludes. Tables and Figures discussed in the main text are gathered at the end of the paper. Appendices for referees (not for publication) are also provided.

2. Recovering voter racism from survey data

From the time of chattel slavery, through the Civil War and the Civil Rights movement of the 1960s, racial issues have been on the political agenda. Racially tinged issues, such as welfare, crime, 'permissive' judges, and government regulation, have been the subject of strenuous political debate and strong legislation for the last three decades. Debates are fierce when 'race-conscious' remedies such as affirmative action are on the table, as seen in the *Bakke v. Regents of the University of California* case in 1978 and the *Hopwood v. Texas* case in 1996.

Many commentators argue that race as a political issue has led to significant party and voter realignment in American politics over the last half century. (See Carmines and Stimson (1989), Edsall and Edsall (1991), and Teixera and Rogers (2000) among others.)

According to the National Election Studies (NES), about 83 percent of Southern whites described themselves as Democrats in 1952; as of 1996, only 48 percent did. Northern whites have also gradually defected from the Democratic Party since 1964. In only one election since 1960 has the Democratic candidate received a majority of the total white vote. (See Table A-2-1 and Figure A-2-1 in Appendix 1.) This phenomenon is sharply in contrast with the percentage of blacks voting Democratic, which has always been greater than 90%. Indeed the black vote has been a pivotal factor for the Democratic Party in presidential elections.

This pattern of voting differences across races may tell us little about voter racism; whites may have turned away from the Democratic Party because they oppose big government and the welfare state. (Abramowitz (1994) expresses one such view.)

Explaining whites' opposition to liberal racial policies has been the subject of extensive research by American social scientists over the past quarter century. Although details of this research are quite nuanced, the debates have mainly centered around the relative importance of two factors underlying American racial attitudes: (1) psychological antipathy/resentment, prejudice, and negative beliefs (including stereotyping) against minorities; and (2) political ideology and values such as individualism and libertarianism. Scholars have disputed which of these factors is the principal source of public's opposition to race-related policies, such as affirmative action programs. (See Kinder and Sanders (1996) and Sniderman and Piazza (1993).)

How do we understand white racism in politics? Several remarks are in order.

First, 'the end of racism' in American politics is often asserted from what surveys say about whites' attitudes towards blacks on a few old-fashioned racial issues. It is, however, well documented that there is a large gulf between whites and blacks in the perception of racial inequality and its causes. No matter what national surveys say about whites' attitudes towards blacks, most blacks still see racism persisting among whites. Sigelman and Welch (1991) document striking facts. As of 1989, when only 4% of whites characterized most whites as sharing the Ku Klux Klan's extreme racial views, almost one black in four claimed that more than half of all white Americans accepted the Klan's racial views. Approximately 50% of blacks perceive discrimination in the market for unskilled and skilled labor while only about 10-15% of whites perceive it.

Second, political ideology is not *unidimensional*. One can for example be liberal in one dimension (e.g., pro-choice on abortion issues) but conservative in another dimension (e.g., opposition to redistribution). Thus voters' responses on specific racial issues might be a reflection of various ideological components, not just racism. Consider, for instance, the variable '7 point aid-to-blacks score,' which ranges between 1 ("governments should help blacks to improve their socio-economic position") and 7 ("blacks should help themselves"). One might legitimately argue that the voter position on this variable could be shaped not only by racism but also by libertarianism. (Others might even argue that this is a variable capturing only libertarianism, not racism.) As we will see below, both racism and libertarianism play a role in explaining this variable, although a much larger effect is due to the former.

Third, racism is a *latent* variable. It is useful to distinguish between attitude and behavior. Racial prejudice is *attitudinal and covert* while racial discrimination is *behavioral and overt*. One can easily imagine a person who holds prejudices about blacks but does not act on the basis of these attitudes. This prejudice might be revealed through his or her voting pattern at election time when he or she holds the view that a specific party or a candidate over-represents blacks.

To address these issues, we decompose 'political ideology' (liberal-conservative) of whites into four *orthogonal* latent factors – racism, libertarianism, feminism, and compassion for the poor – by carrying out factor analyses on ten variables in the NES for each presidential election year. These four factors, we believe, constitute core components of American political ideology.

The ten variables are: (1) *antiblack affect*, measured by the difference between a white respondent's thermometer rating of blacks and his rating of his own ethnic group; (2) the belief that *blacks are pushing too hard*, measured by the responses on the question of whether civil rights movement is pushing too fast; (3) thermometer rating towards *the poor* (4) thermometer rating towards *people on welfare;* (5) thermometer rating towards *trade unions*; (6) the belief that *government is too strong* to be able to respect individual responsibility and liberty; (7) the *lack of trust* in government; (8) thermometer rating towards the *women's liberation movement*; (9) perception about *equal role for women*; and (10) the scale of *political ideology* (a conservative-libertarian scale). (See Appendix 2 for precise wordings for these variables.

Racism is defined as a factor loading highly on (1) and (2), compassion towards the poor loads highly on (3)-(5), libertarianism loads highly on (6)-(7), and feminism loads highly on (8)-(9). All factors load on political ideology.

Note that our definition of racism is conservative and much narrower than the definition given by proponents of so-called '*symbolic racism*,' which attributes responses to 'blacks lack work ethic' to racism (Kinder and Sanders, 1996). Instead of 'including' this attitude as a component of racism, we 'explain' it in terms of the definition more narrowly defined.

Four primary orthogonal factors emerge from our factor analysis across all years – with eigenvalues ranging from 1.00 to 2.5 – and these explain about 60% of the total variation of the 10 variables in each year. By construction, these factors are uncorrelated with each other and each has mean zero and standard deviation one.

We also decompose the political ideology of blacks into three factors (libertarianism, compassion, and feminism) using only (3)-(10) (we define blacks to be racism-free), but the discussion in this section will mainly focus on white voters. Factor loadings for white respondents in the two end years (1976 and 1992) after varimax rotation are reported in Table A-2-2 in Appendix 1.

To see how these four ideological components affect various social attitudes of white voters, we ran various multivariate regressions. Table 2-1 reports some of the results from these regressions. (For other results, see Tables A-2-3 and A-2-4 in Appendix 1.)

[Table 2-1 about here]

Columns (1)-(3) report the regression results when the dependent variable is a measure of racial attitude. In all three cases, racism is the single most important factor in explaining various racial attitudes in terms of the size of the coefficient and statistical significance. We learn that, in contrast to the popular political rhetoric, libertarianism plays very little role in explaining racial attitudes, except for aid-to-blacks. Consider, for example, column (2), which takes as the dependent variable the question asking whether 'blacks can get better off if they try harder.' A majority of white voters provide positive answers to this question, and based upon this observation, it is often argued that whites oppose racially liberal policies because they believe that blacks lack an individualistic work ethic, a belief that is considered *race-neutral*. If this contention were true, we would expect that libertarianism, which is racism-free by construction, would have a highly significant coefficient; but it does not. This point is clearer in column (3). Racists are more likely to believe that the position of blacks has changed a lot, while racism-free libertarians, like feminists, say that it has not changed much. Thus our results appear to show that it is not *racism-free libertarianism* but *racism camouflaged behind libertarian rhetoric* that explains much of the white opposition to various racial policies in the United States.

Our result is consistent with findings of other scholars. In measuring individualism or libertarianism, many scholars warn against treating positive answers to *race-referring* questions – such as "*blacks* can get better off if they try harder" – as a direct expression of individualism or libertarianism. Kinder and Sanders (1996) approach the issue by making use of a set of six questions in the NES that attempt to tap individualism in a race-neutral way (e.g., "any *person* who is willing to work hard has a good chance at succeeding"); it could be expected that those high on individualism measured in this way would be those most likely to oppose government action to help blacks. They find that controlling for social backgrounds, there is little evidence of a relationship between these two views. Kinder and Mendelberg (2000) thus call the view "blacks should try harder" *racialized individualism* in the sense that this kind of measure mixes convictions about individual responsibility with resentment directed towards blacks.

Why libertarianism plays very little role in explaining various racial attitudes is an interesting question. Pettigrew (2000) shows that authoritarianism, not libertarianism, underlies racism (and anti-feminism) in Europe. Authoritarianism is associated with restoring traditional values, strengthening patriotic and family feelings, pursuing a strong nationalist, racist or anti-Communist policy, and reinforcing respect for authority, all of which may involve limiting 'disapproved lifestyles.' Libertarians may see the racist and chauvinistic attitude of authoritarians as opposing their commitment to personal freedom. Indeed there is no reason to believe that true libertarians should oppose the liberalization of laws concerning homosexuality, divorce, abortion, anti-racism etc.,

The US data reveal a similar pattern. (See Table A-2-4 in Appendix 1.) It appears that racism is positively correlated with authoritarian and traditionalist values. For instance, racism is positively correlated with support for defense spending, while libertarianism is (insignificantly) negatively correlated with it (column 13). Racists strongly prefer to solve the urban unrest problem by force, while libertarians' support for force is much weaker (column 14). Libertarians are neutral about the authority of the bible, school prayer, and abortion, but racists are strongly in favor of school prayer, hold firm beliefs in the bible's authority, and take a strong anti-abortion position, even after controlling for a religion effect (columns 15-17).

Indeed, libertarians and racists differ in several ways. Libertarians are strongly against increasing public school spending but the effect of racism is much weaker (column 4). Although libertarians strongly believe that the government wastes tax money (column 10), this belief is not strongly correlated with the racism variable. Thus it appears that racism-free libertarians are consistent in opposing any kind of government spending (except environmental), although coefficients are insignificant in many cases. Racists, on the other hand, exhibit different attitudes to different spending programs.

Columns (1)-(3) of Table 2-1 also show that the income variable is very weakly associated with racial views. In most cases, the coefficients are not significant, and even in the significant cases the size of the coefficient is very small. One popular contention is that whites oppose racially liberal policies because whites are richer than minorities on average and these policies benefit only poor minorities at the cost of whites. But our results suggest that whites do not see racial policies as *redistributive* ones that are costly to them.[2]

Table 2-1 also examines the importance of the ideological factors in shaping political preferences: see columns (4)-(6).

At the beginning of this section, we documented that there was large-scale white flight from the Democratic Party in the past three decades. What drove the white flight?

To estimate the effects of different types of issues on white flight from the Democratic Party, we conducted probit analyses of voting behavior separately for those who declare that they are Democrats and for those who declare that they are Republicans. The dependent variable in this analysis is party defection: among the self-declared Democrats, those who vote D are coded 0; those who had defected from the Democratic Party (i.e., those who voted for either R or a third candidate) are coded 1. Similarly, among the self-declared Republicans, those who voted R are coded 0; those who defected are coded 1.

Columns (4) and (5) in Table 2-1 show that the defection of Democrats was largely due to their dissatisfaction with the Democratic Party's racial liberalism, whereas the defection of Republicans was mainly due to their dissatisfaction with the Republican party's conservatism on the gender/family issue. Poor economic performance under a party's incumbency is also an important factor explaining the defection from that party. In contrast to Abramowitz's (1994) argument that the large-scale defection of whites from the Democratic Party is mainly due to traditional Democrats' becoming increasingly fed up with big government and the welfare state, the libertarianism variable is statistically insignificant and carries a negative coefficient.

[2] We checked a possible non-linear effect by adding a quadratic term of the income variable and by regressing against the log of income. There is no evidence that income exercises a non-linear effect.

Column (6) shows the result of our probit regression on voting pattern. Because there are only two parties, we report only the R vote share. Again racism, compassion, and feminism show up as important explanatory variables, but libertarianism does not. Figure 2-1 shows the slope of the regression equation with respect to each component of political ideology, together with 95% asymptotic confidence intervals; the graph is almost flat with respect to libertarianism.

[Figure 2-1about here]

We have seen the importance of voter racism in various ways; what matters for our purposes is the voter's position on politically salient racial issues, such as affirmative action or the government's aid to minorities, not the racism per se. One variable that measures the voter position on racial issues is the '7 point aid-to-blacks score.' Complications of interpretation arise, however, because the voter position on aid-to-blacks could be shaped by many factors, not just by racism. For instance, column (1) of Table 2-1 shows that libertarianism plays some role in explaining this variable, although a much larger effect is due to racism. Simply treating voters who are not in favor of aid-to-blacks as racist would overestimate the extent of racial conservatism in the US.

We therefore construct the *aid-to-blacks score induced only by voter racism* as follows. The aid-to-blacks variable runs from 1 to 7, but let us assume that voters' true attitudinal value on aid-to-blacks lies continuously in the interval $[0.5,7.5]$. For the samples consisting of white respondents, we ran the following regression in each year,

$$Aidtoblacks = \frac{7 * \exp\left(\alpha_1 Racism + \boldsymbol{\alpha}_2 \mathbf{Z} + \nu\right)}{1 + \exp\left(\alpha_1 Racism + \boldsymbol{\alpha}_2 \mathbf{Z} + \nu\right)} + 0.5\,, \tag{1}$$

which is equivalent to $\log\left(\frac{Aidtoblacks - 0.5}{7.5 - Aidtoblacks}\right) = \alpha_1 Racism + \boldsymbol{\alpha}_2 \mathbf{Z} + \nu$, where $\mathbf{Z}$ is the vector of all other variables in the regression (those appearing in Table 2-1) and ν is the error term. Then 'racism-induced aid-to-blacks' is constructed from the above regression by the equation, $\rho = \dfrac{7 * \exp\left(\hat{\alpha}_1 Racism + \hat{\boldsymbol{\alpha}}_2 \overline{\mathbf{Z}}\right)}{1 + \exp\left(\hat{\alpha}_1 Racism + \hat{\boldsymbol{\alpha}}_2 \overline{\mathbf{Z}}\right)} + 0.5$, where $\overline{\mathbf{Z}}$ is the mean value of the vector **Z**. This procedure generates a policy position variable whose variation is explained only by the variation of racism after controlling for other explanatory variables. It also guarantees that our racism-induced aid-to-blacks scores have the same support as the original aid-to-blacks scores. The racism-induced aid-to-blacks is our measure of voters' racial policy position. For blacks we assign the score of 1.[3]

3. The equilibrium model

In this section we present a model of political competition between two parties where the policy space is *two-dimensional*; one dimension of competition concerns redistribution, and the other, racial policy. Parties will propose, in their platforms, both a fiscal policy and a policy on the race issue. The model of multi-dimensional political competition is that of Roemer (2001), called *party unanimity Nash equilibrium with endogenous parties* (PUNEEP). Parties will have *differentiated platforms* at the equilibrium. Our exposition will be minimal; the reader is referred to Roemer (2001) for more detail.

A. Definition and equilibrium

The model takes as *data* the distribution of voter preferences over an issue space, and produces as *output*: (1) a partition of the polity into two parties, (2) two policy vectors (or platforms) that parties propose in competitive political equilibrium, and (3) the expected vote share that each party receives

[3] When we estimate the distribution of voter types, however, we avoid the problem of censoring by assuming that blacks are distributed on the support of [0.5,1.5] according to a normal distribution with

in the election. Formally, we take as data a set of voter types $H \subset \mathbf{R}^n$, a probability measure **P** on H, a policy space $T \subset \mathbf{R}^m$, and a profile of voter utility functions on *T*, where $v(.;\eta)$ is the utility function of a voter type $\eta \in H$ on *T*.

The theory produces, given $\{\mathbf{P}, H, v, T\}$, a two-dimensional manifold of equilibria, which we will denote $\{\Gamma^D(i), \Gamma^R(i), \tau^D(i), \tau^R(i)\}$. Each *i* indexes one equilibrium; in the i^{th} equilibrium, $\Gamma^D(i)$ is the set of voter types who belong to and vote for the Democratic party, $\Gamma^R(i)$ is the set of voter types who belong to and vote for the Republican party, $\tau^D(i) \in T$ is the platform of the Democratic party in this equilibrium, and $\tau^R(i) \in T$ is the platform of the Republican party in the equilibrium.

We proceed to define the equilibrium concept. It is presumed that there are two political parties, and that each party's decision makers comprise three factions: Opportunists, Reformists, and Militants.

Suppose that the constituents of party D are denoted by the set of types $\Gamma^D \subset H$, and the constituents of party R are denoted by the set of types $\Gamma^R = H \setminus \Gamma^D$. Define

$$V^D(\tau) = \int_{\Gamma^D} q^D(\eta) v(\tau;\eta) d\mathbf{P}(\eta), \tag{2}$$

and

$$V^R(\tau) = \int_{\Gamma^R} q^R(\eta) v(\tau;\eta) d\mathbf{P}(\eta), \tag{3}$$

where $q^J(\eta)$ is a weight function given to members of party J for J=D,R. Hence V^J is the weighted average utility function of party J's constituents. In the ideal case of perfectly representative democracy, the weights would be equal for all η in both parties. In reality, however, party platforms are greatly influenced by, say, campaign contributions. Bartels (2002) examines the differential responsiveness of U.S. senators to the preferences of rich and poor constituents, and finds that on average,

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mean 1 and a small variance. See section 4.

constituents at the 75th percentile of the income distribution have almost three times as much influence on senators' general voting patterns as those at the 25th percentile. The weight function is introduced as a short-cut to capture the unequal influence of constituents on party policy.

In an election between two policy platforms, $\tau^D, \tau^R \in T$, denote the *probability* that τ^D defeats τ^R by $\pi(\tau^D, \tau^R)$, on which more below. The three factions in each party have different interests, which induce their different *payoff functions.* The Opportunists in a party wish to choose a policy that will maximize their party's probability of victory. The Reformists wish to choose a policy that will maximize the expected utility of the party, using the utility function V^J (J= D or R). The Militants are unconcerned about immediate victory; they wish to announce a policy as close as possible to the (weighted) ideal policy of their constituents (members). Thus the three payoff functions of these factions in the D party, on $T \times T$, are given by:

$$\Pi^{D-Opp}(\tau^D, \tau^R) = \pi(\tau^D, \tau^R), \tag{4}$$

$$\Pi^{D-\text{Ref}}(\tau^D, \tau^R) = \pi(\tau^D, \tau^R)V^D(\tau^D) + (1-\pi(\tau^D, \tau^R))V^D(\tau^R), \tag{5}$$

$$\Pi^{D-Mil}(\tau^D, \tau^R) = V^D(\tau^D), \tag{6}$$

In like manner, we define Π^{R-Opp}, $\Pi^{R-\text{Ref}}$, and Π^{R-Mil}.

Definition: A *party unanimity Nash equilibrium with endogenous parties (PUNEEP)* is a partition $H = \Gamma^D \cup \Gamma^R$, $\Gamma^D \cap \Gamma^R = \phi$, and a pair of policies $(\tau^D, \tau^R) \in T \times T$ such that:

(1) there is no $\tau \in T$ such that $\Pi^{D-f}(\tau, \tau^R) \geq \Pi^{D-f}(\tau^D, \tau^R)$, for f = Opp, Ref, Mil, with at least one strict inequality;

(2) there is no $\tau \in T$ such that $\Pi^{R-f}(\tau^D, \tau) \geq \Pi^{R-f}(\tau^D, \tau^R)$, for f = Opp, Ref, Mil, with at least one strict inequality; and

(3) given (τ^D, τ^R), $\qquad \eta \in \Gamma^D \Rightarrow v(\tau^D;\eta) \geq v(\tau^R;\eta)$,

$$\eta \in \Gamma^R \Rightarrow v(\tau^R;\eta) \geq v(\tau^D;\eta).$$

Remark 1: Condition (1) can be viewed as modeling the idea that, facing the policy τ^R proposed by party R, the three factions in party D have bargained internally to a proposal τ^D, because τ^D lies on the Pareto mini-frontier of D's three factions' payoff functions, given τ^R. In like manner, condition (2) models the idea that τ^R is a bargaining outcome among Right's three factions, facing τ^D. So a PUNEEP incorporates competition between parties (in the sense of Nash equilibrium) and bargaining among internal factions. (Indeed, it can be shown (Roemer, 2001, Chapter 8) that with further restrictions, we can characterize the internal conflict as *Nash bargaining*.) A formula for the inner party bargaining power of factions will be presented in section 3.E. We do not specify the relative bargaining strengths of factions *a priori*, because, first, we do not know the empirical bargaining power of the factions, and second, we cannot be sure that equilibrium will exist, with respect to any given *pre-specified* pair of relative bargaining strengths. Condition (3) is a condition of membership stability; it says that no party member prefers the opposition party's policy at the equilibrium.

Remark 2: It is easy to show that the Reformists are gratuitous: that is, we can excise them from the construction, and the set of equilibria does not change (Roemer, 2001, Chapter 8). We use this remark in the following characterization of PUNEEP.

We proceed to a local characterization of PUNEEPs that are in the interior of $T \times T$.

Suppose $T \subset \mathbf{R}^m$. Define $\nabla_J \pi(\tau^D, \tau^R) = (\frac{\partial \pi}{\partial \tau_1^J}, \ldots, \frac{\partial \pi}{\partial \tau_m^J})$, $\nabla V^J(\tau) = (\frac{\partial V^J}{\partial \tau_1}, \ldots, \frac{\partial V^J}{\partial \tau_m})$, and

$\Omega(\tau^D, \tau^R) = \{\eta \in H \mid v(\tau^D;\eta) \geq v(\tau^R;\eta)\}$.

Then a PUNEEP is a partition $\Gamma^D \cup \Gamma^R$ of H and a policy pair $(\tau^D, \tau^R) \in T \times T$ such that for some $x^D, x^R \in \mathbf{R}_+$,

$$-\nabla_D \pi(\tau^D, \tau^R) = x^D \nabla V^D(\tau^D), \tag{7}$$

$$\nabla_R \pi(\tau^D, \tau^R) = x^R \nabla V^R(\tau^R), \tag{8}$$

$$\Gamma^D = \Omega(\tau^D, \tau^R),\ \Gamma^R = H \setminus \Gamma^D. \tag{9}$$

Equation (7) says that, given τ^R, there is no direction in *T* at τ^D which will increase the payoffs of both Opportunists and Militants of party D, and equation (8) implies the analogous statement for party R's Opportunists and Militants. These two equations say that the indifference curves of the Opportunists and the Militants in party J are tangent at the equilibrium. Equation (9) says that party D's constituents are exactly those voters who weakly prefer policy τ^D. By Remark 2, these are the necessary conditions that characterize a PUNEEP.

Note that equations (7) and (8) comprise 2m equations in 2m+2 unknowns: $(\tau^D, \tau^R, x^D, x^R) \in \mathbf{R}^{2m+2}$. Consequently, if there are any solutions, we can expect a 2-manifold of them. (The dimensionality of the solution manifold is related to the number of factions, not the dimension of the policy space. For further discussion, see the aforementioned Roemer citation.)

We proceed to discuss our application of the model to the present paper.

B. Preferences, type space, and policy space

We postulate that the economic position of an individual *h* is given by his/her family head's real wage rate, denoted by $\hat{w}_h$ and called the *representative wage* of individual *h*. The representative wage of individual *h* is an individual wage except for wives. It coincides with his/her own wage for singles and married males but corresponds to the husband's wage for a married female. The racial position of voter h is, on the other hand, completely individualistic; we denote it by ρ_h; a wife's racial position is allowed to differ from her husband's. We measure the racial position of voters by the 'racism-induced aid-to-blacks' that we constructed in section 2.

The *type* of voter h is thus characterized by a pair $\eta = (\hat{w}_h, \rho_h) \in H$ and the type space is two-dimensional. (Do not confuse h with η. Letter h is an index for individuals while η is a voter type.) The distribution of voter types is given by a joint density function $g(\rho \mid \hat{w}) f(\hat{w})$. The distribution function for $f(.)$ is $F(.)$ and the distribution function for $g(. \mid \hat{w})$ is $G(. \mid \hat{w})$.

The justification for our model specification—i.e., that a voter's economic position is characterized by his/her representative wage while his/her racial position is individualistic – is threefold. First, many tax-benefit policies in the US are applied at the family level. Consumption and labor participation behavior of an individual can be properly understood only within the family framework. Second, labor supply behavior may be different between males and females, in particular for married couples. Third, voting behavior on the tax rate will typically depend on family income, not individual income, but voting behavior on the racial issue can be quite different among the members of the same family (although there may be a strong correlation among family members). For instance, although her actual earned income is zero, a non-working housewife living with a rich husband may vote like a rich individual on tax rates. She may, however, be more liberal than her husband on the racial issue. Our utility function will permit this possibility.

We postulate that a voter has direct preferences over vectors (x_h, L_h^f, E, r), where x_h is the consumption of goods and services of voter *h at the family level*, L_h^f is the vector of working hours of the voter's family members (hence $L_h^f = L_h$ if h is single, and $L_h^f = (L_{M(h)}, L_{F(h)})$ if he/she is married, where *M(h)* (*F(h)*) stands for the male (female) member of h's family), E is a measure of equality in the distribution of family consumption (which we call solidarity), and r is the position of the elected government on racial issues.

More specifically, the direct utility function of an individual h is of the form:

$$U(x_h, L_h^f, E, r; \hat{w}_h, \rho_h) = \phi(x_h, L_h^f) - \frac{\gamma}{2}(r - \rho_h)^2 + (\delta_0 - \delta_2 \rho_h)E, \tag{10}$$

where $\phi(x_h, L_h^f) = \begin{cases} Log(x_h) + \beta_M Log(\lambda_M - L_{M(h)}) + \beta_F Log(\lambda_F - L_{F(h)}) & \text{if } h \text{ is married} \\ Log(x_h) + \beta_S Log(\lambda_S - L_h) & \text{if } h \text{ is single} \end{cases}$

and $E = Log\left(\dfrac{x_{0.25}}{x_{0.75}}\right)$ is the log ratio of the consumption of the family at the 25$^{\text{th}}$ percentile of the income distribution to that at the 75$^{\text{th}}$ percentile.

This utility function consists of three parts: the sub-utility function $\phi(.)$ defined over consumption and labor participation of family members, the preferences over the race issue, and preferences for equality.

Voters' preferences with regard to the race issue are Euclidean, where the parameter γ measures the *relative salience* of the race issue. The coefficient of the equality term E measures the extent to which voters value equality in the distribution of consumption. Note that the coefficient of E is negatively related to voter's degree of racism (ρ_h), assuming that $\delta_2 > 0$. Larger ρ means a more racist voter, and so the anti-solidarity effect of racism is embodied in the parameter δ_2 (the more positive the coefficient δ_2, the stronger the anti-solidarity effect). The policy bundle effect, on the other hand, will depend on the parameter γ.

Each political party will propose an affine tax policy (t,b), applied to family income, and a racial policy, r. The policy vector is applied to all individuals, once determined through political competition.

Let Y be the earned family income and O other non-wage income (usually consisting of asset income, minus deductions and exemptions). Then if the tax rate is t and the lump-sum payment is b, post-fisc income (which we call 'consumption') will be

$$x_h = (1-t)(Y_h + O_h) + b\,. \tag{11}$$

C. Labor supply decision of household members

Each individual of the household chooses his/her labor supply by optimizing against the tax policy and the market wage rate. We first describe the labor supply decision of married couples. To avoid cluttering the notation, we will drop h henceforth.

The optimality conditions for labor supply are

$$\frac{(1-t)w_s}{x} = \frac{\beta_s}{\lambda_s - L_s}, \tag{12}$$

where s = M, F, and $x = (1-t)(w_M L_M + w_F L_F + O) + b$. (Remark: We use the capital letter S to denote 'singles,' and the small letter s as an index for 'sexes.') Rearranging terms for both sexes, we have the following two equations:

$$L_M = \frac{\lambda_M}{1+\beta_M} - \frac{\beta_M}{1+\beta_M}\left(\frac{b}{(1-t)} + w_F L_F + O\right)\frac{1}{w_M} \text{ for males,} \tag{13}$$

and

$$L_F = \frac{\lambda_F}{1+\beta_F} - \frac{\beta_F}{1+\beta_F}\left(\frac{b}{(1-t)} + w_M L_M + O\right)\frac{1}{w_F} \text{ for females.} \tag{14}$$

To maintain the two dimensional type space, we assume that female wage rates are proportional to male wage rates: $w_F = k_1 w_M$ for married couples. Empirically, the female wage rate is represented quite accurately as a proportion of the male wage rate. For a nonworking housewife, w_F is her imputed wage rate, which is positive if her husband is working.

Solving equations (13) and (14) simultaneously and using the facts that $w_F = k_1 w_M$ and $\hat{w} = w_M$ for married couples, we compute the optimal labor supply for both sexes:

$$\hat{L}_M(t,b,\hat{w}) = \frac{\lambda_M(1+\beta_F) - k_1\lambda_F\beta_M}{1+\beta_M+\beta_F} - \frac{\beta_M}{1+\beta_M+\beta_F}\left(\frac{b}{(1-t)}+O\right)\frac{1}{\hat{w}}, \tag{15}$$

and

$$\hat{L}_F(t,b,\hat{w}) = \frac{\lambda_F(1+\beta_M) - \beta_F\lambda_M\frac{1}{k_1}}{1+\beta_M+\beta_F} - \frac{\beta_F}{1+\beta_M+\beta_F}\left(\frac{b}{(1-t)}+O\right)\frac{1}{k_1\hat{w}}. \tag{16}$$

We derived the labor supply functions for married couples. For singles, we do not have to consider the simultaneous decision problem. Hence for singles

$$\hat{L}_S(t,b,\hat{w}) = \frac{\lambda_S}{1+\beta_S} - \frac{\beta_S}{1+\beta_S}\left(\frac{b}{1-t}+O\right)\frac{1}{\hat{w}}, \tag{17}$$

where $\hat{w}$ is his/her own wage.

Using (15) and (16) and (17), we obtain household labor income of an individual:

$$Y = \begin{cases} w_M\hat{L}_M(t,b,\hat{w}) + k_1 w_M \hat{L}_F(t,b,\hat{w}) & \text{for a married} \\ w_S\hat{L}_S(t,b,\hat{w}) & \text{for a single} \end{cases} = A^*\hat{w} - B^*\left(\frac{b}{1-t}+O\right), \tag{18}$$

where $A^* = \begin{cases} \dfrac{\lambda_M + k_1\lambda_F}{1+\beta_M+\beta_F} & \text{for a married} \\ \dfrac{\lambda_S}{1+\beta_S} & \text{for a single} \end{cases}$ and $B^* = \begin{cases} \dfrac{\beta_M+\beta_F}{1+\beta_M+\beta_F} & \text{for a married} \\ \dfrac{\beta_S}{1+\beta_S} & \text{for a single} \end{cases}$.

Hence pre-tax family income, as the sum of labor income and other non-labor income, is given by

$$W = A^*\hat{w} - B^*\left(\frac{b}{1-t}+O\right) + O = A^*\hat{w} - B^*\frac{b}{1-t} + (1-B^*)O. \tag{19}$$

'Other non-wage income' is usually generated from savings, the source of which is past labor income or past other income (i.e., the past pre-fisc income). We assume that 'other income' is proportional to the current pre-fisc income: $O = k_3 W$ (see section 4). Past pre-fisc income is highly correlated with current pre-fisc earned income. Then pre-fisc family income is

$$W = \frac{1}{1-k_3(1-B^*)}(A^*\hat{w} - B^*\frac{b}{1-t}). \tag{20}$$

Equation (20) simply states that the pre-fisc income *W* is proportional to labor income, where the proportion coefficient is greater than 1, due to the existence of other non-wage income.[4]

As we said, taxes are imposed on pre-fisc family income, so that consumption is computed by $x(t,b,\hat{w}) = (1-t)W + b$. Thus dropping constant terms we have

$$\phi(x(t,b,\hat{w}), L^f(t,b,\hat{w})) = \begin{cases} Log((1-t)A^*\hat{w} + (1-k_3)(1-B^*)b)^{1+\beta_M+\beta_F} - Log((1-t)\hat{w})^{\beta_M+\beta_F} & \text{for a married} \\ Log((1-t)A^*\hat{w} + (1-k_3)(1-B^*)b)^{1+\beta_S} - Log((1-t)\hat{w})^{\beta_S} & \text{for a single} \end{cases} \tag{21}$$

In principle, one could estimate $\beta's$ and $\lambda's$ for married couples and singles separately, but this would require a tremendous amount of computation time. To reduce our computation time we will estimate them for married couples only and then simply impute $\beta_S = \beta_M + \beta_F$ and $\lambda_S = \lambda_M + k_1\lambda_F$ for singles. In other words, it is assumed that the indirect subutility functions are identical for both married couples and singles.[5]

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[4] Since *O* is the asset income accumulated from the past labor income, not *current* labor income, voters take *O* as given when they choose labor supply, and so we did not use the relationship between *O* and *W* when we derived the labor supply functions.

[5] Our approach is justified if an allocation of *individual* time between work and leisure for singles is similar to the allocation of *family* time between work and leisure for married couples, and the total endowment of time available for singles (λ_S) is similar to the total endowment of time available at the family level for married couples $(\lambda_M + k_1\lambda_F)$.

D. Government budget constraint

It remains to derive the government budget equation. We assume government revenues are used in financing lump-sum redistribution, *b*, and providing publicly provided goods, *C*, where the per capita spending on publicly provided goods is given and exogenous.

Note from equation (20) that taxable income *W* is positive only for individuals with $\hat{w} > \frac{B^*}{A^*}\frac{b}{1-t}$. This is because labor income is zero for individuals with low wages, given a positive tax rate and government transfers. Hence the government's budget constraint is

$$t\int_{\frac{B^* b}{A^*(1-t)}}^{\infty}\left(\frac{1}{1-k_3(1-B^*)}(A^*\hat{w}-B^*\frac{b}{1-t})\right)dF(\hat{w}) = b + C. \tag{22}$$

The amount of transfer, *b*, is determined by solving the integral equation (22). The budget constraint will enable us to solve for *b* as a function of *t*, and we therefore write $b = b(t)$. Consequently, we now write policies as ordered pairs $(t,r) \in \mathbf{R}^2$. The policy space is two-dimensional.

Since the left-hand side expression of equation (22) is decreasing in *b*, the equation has a unique solution. If *C>0*, the function *b*(*t*) is zero at a positive tax rate. The minimum tax rate that makes *b*(*t*) positive is the solution *t* of the equation

$$t\int_{0}^{\infty}\left(\frac{A^*\hat{w}}{1-k_3(1-B^*)}\right)dF(\hat{w}) = C. \tag{23}$$

Therefore, $t_{\min} = \frac{C(1-k_3(1-B^*))}{A^*\mu_w}$, where μ_w is the mean wage rate. We will estimate the transfer function *b(t)*, or Laffer curve, later in section 4; it is hump-shaped in *t* (see below). If t_{max} is the tax rate that maximizes *b*(*t*), the equilibrium tax rates at PUNEEPs always lie in the interval $[t_{\min}, t_{\max}]$.

The indirect utility function, after substituting $b(t)$, is given by

$$v(t,r;\hat{w},\rho)=\tilde{\phi}(t;\hat{w})-\frac{\gamma}{2}(r-\rho)^2+(\delta_0-\delta_2\rho)\tilde{E}(t), \tag{24}$$

where $\tilde{\phi}(t;\hat{w})=\phi(x(t,b(t),\hat{w}),L^f(t,b(t),\hat{w}))$ and $\tilde{E}(t)=Log\left(\frac{x(t,b(t),\hat{w}_{0.25})}{x(t,b(t),\hat{w}_{0.75})}\right)$. The function v, so defined, is the function $v:T\times H\to\mathbf{R}$ of the formal definition in section 3.A.

E. Computation of PUNEEP

Let $\tau=(t,r)$ be a policy vector. We compute that the set of types that prefer a policy $\tau^D=(t^D,r^D)$ to a policy $\tau^R=(t^R,r^R)$ is

$$\Omega(\tau^D,\tau^R)=\begin{cases}\{(\hat{w},\rho):\rho<\Psi(\hat{w},\tau^D,\tau^R)\} & \text{if } \gamma(r^R-r^D)+\delta_2(\tilde{E}(t^D)-\tilde{E}(t^R))>0\\ \{(\hat{w},\rho):\rho>\Psi(\hat{w},\tau^D,\tau^R)\} & \text{if } \gamma(r^R-r^D)+\delta_2(\tilde{E}(t^D)-\tilde{E}(t^R))<0\end{cases}, \tag{25}$$

where

$$\Psi(\hat{w},\tau^D,\tau^R)=\frac{\tilde{\phi}(t^D;\hat{w})-\tilde{\phi}(t^R;\hat{w})+\frac{\gamma}{2}((r^R)^2-(r^D)^2)+\delta_0(\tilde{E}(t^D)-\tilde{E}(t^R))}{\gamma(r^R-r^D)+\delta_2(\tilde{E}(t^D)-\tilde{E}(t^R))}. \tag{26}$$

The voting fraction for party D is defined by $\varphi(\tau^D,\tau^R)=\mathbf{P}(\Omega(\tau^D,\tau^R))$.

The typical case in Democratic-Republican equilibria is $\gamma(r^R-r^D)+\delta_2(\tilde{E}(t^D)-\tilde{E}(t^R))>0$, and in that case it follows from (25) that the expected vote share is

$$\varphi(\tau^D,\tau^R)=\int_0^\infty\int_0^{\Psi(w,\tau^D,\tau^R)}dG(\rho\mid w)dF(w)=\int_0^\infty G(\Psi(w,\tau^D,\tau^R)\mid w)dF(w). \tag{27}$$

(The other case can be studied in a similar manner by symmetry.)

However, we postulate that there is some uncertainty about how citizens will vote, due to abstention, misperception of policies by voters, scandals, and so on. Parties estimate the fraction of citizens who will vote for each party, but these estimates are subject to a margin of error. We summarize this by positing that there is only a *probability* that, if the voters are offered the choice (τ^D, τ^R), one policy will win. We only postulate that the probability that the *D* policy wins is a strictly increasing function of the expected vote share; that is, $\pi(\tau^D, \tau^R) = \zeta(\varphi(\tau^D, \tau^R))$, where $\zeta : [0,1] \to [0,1]$ is a strictly increasing function.

Note that we can characterize the opportunists as wishing to maximize *expected vote share*, since probability of victory is just an increasing transformation of expected vote share. This means that the policies in PUNEEPs are independent of the $\zeta(.)$. We utilize this below.

It follows that we can expand equations (7) and (8) as:

$$-\begin{pmatrix} \int_0^\infty g(\Psi(w,\tau^D,\tau^R)\,|\,w)\dfrac{\partial \Psi}{\partial t^D}dF \\ \int_0^\infty g(\Psi(w,\tau^D,\tau^R)\,|\,w)\dfrac{\partial \Psi}{\partial r^D}dF \end{pmatrix} = x^D \begin{pmatrix} \int_0^\infty \int_0^\Psi q(w)\dfrac{\partial v}{\partial t^D}dG(\rho\,|\,w)dF \\ \int_0^\infty \int_0^\Psi q(w)\dfrac{\partial v}{\partial r^D}dG(\rho\,|\,w)dF \end{pmatrix}, \qquad (28\text{ a \&b})$$

$$\begin{pmatrix} \int_0^\infty g(\Psi(w,\tau^D,\tau^R)\,|\,w)\dfrac{\partial \Psi}{\partial t^R}dF \\ \int_0^\infty g(\Psi(w,\tau^D,\tau^R)\,|\,w)\dfrac{\partial \Psi}{\partial r^R}dF \end{pmatrix} = x^R \begin{pmatrix} \int_0^\infty \int_\Psi^\infty q(w)\dfrac{\partial v}{\partial t^R}dG(\rho\,|\,w)dF \\ \int_0^\infty \int_\Psi^\infty q(w)\dfrac{\partial v}{\partial r^R}dG(\rho\,|\,w)dF \end{pmatrix}, \qquad (29\text{ a \& b})$$

where $g(.\,|\,w)$ is the density of $G(.\,|\,w)$.

We turn to discuss the weight function $q(.)$ given in equations (2) and (3). Because the rich contribute disproportionately more than the poor, we take the weight functions to be convex up to a cap. In particular, we specify that for both parties the weight function is given by

$$q(w) = \begin{cases} \hat{q}(w) = q_0 + q_1 \exp(q_2 w) & w \le w_{cap} \\ 1 & w > w_{cap} \end{cases}, \qquad (30)$$

where $\hat{q}(w)$ satisfies $\hat{q}(0) = 0$ and $\hat{q}(w_{cap}) = 1$. We set w_{cap} as the 99th centile of the wage rate distribution. (So all individuals whose incomes are greater than the 99th percentile have equal weights.)

The two conditions, $\hat{q}(0)=0$ and $\hat{q}(w_{cap})=1$, imply that $q_0=-q_1$ and $q_1=\dfrac{1}{\exp(q_2 w_{cap})-1}$. The value of q_2 is estimated using Bartels' (2002) result that constituents at the 75th percentile of the income distribution have three times as much influence as those at the 25th percentile .

We compute the *bargaining power* of the two factions in each party at a PUNEEP. Suppose α^J_{opp} is the Nash bargaining weight of the opportunist faction in party J and τ^J is the equilibrium party platform of party J. Then the bargaining power of militants against opportunists in party J is

$$\frac{1-\alpha^J_{opp}}{\alpha^J_{opp}}=x^J\,\frac{V^J(\tau^J)-V^J(\tau^{J'})}{\pi^J(\tau)}, \tag{31}$$

where $J=D,R$, $J'\neq J$, $\tau=(\tau^D,\tau^R)$. See Roemer (2001, Chapter 8) for the derivation.

F. The policy bundle effect and the anti-solidarity effect

We provide a preview of our strategy. In section 4, we will estimate the distribution of types and all the parameters of the utility function. Our model specification at these estimated values will be extremely good in predicting observed values. We then perform two counterfactual experiments.

First, we counterfactually run an election in which taxation is the only policy. Thus, we assume that the government's racial policy is exogenously fixed at some $r=\bar{r}$. (This is equivalent to assuming that $\gamma=0$.) In this experiment, the phenomenon of poor, racist voters voting Republican because the Republicans put forth racist positions (i.e., the policy bundle effect) *will not exist*, because neither party offers a position on race. However, voters will still be equipped with their anti-solidaristic preferences, which are, in part, a consequence of racism, and those continue to influence the equilibrium tax rate. The difference between the tax rates in the equilibria of this counterfactual and the tax policy in the full model is the *policy bundle effect* of racism.

We next run a second experiment in which we continue to assume that the race issue is not a policy issue; we also now assume that all voters have non-racist preferences -- that is, we assign the lowest possible value of ρ, i.e., $\rho_{\min}$, to all voters. We again compute PUNEEPs by solving equations (28a) and (29a). The tax policies in these PUNEEPs are what we predict taxes would be if racial attitudes were *neither* reducing solidarity among citizens *nor* were the policy bundle effect active.

Schematically, our decomposition procedure is as follows. Let t^J be equilibrium tax policy for party J. Then for each party J the total effect of voter racism on the tax rate can be decomposed into:

$$\begin{array}{cll} & t^J(\text{full model}) - t^J(\mathrm{r} = \bar{\mathrm{r}}, \rho = \rho_{\min}) & \text{total effect} \\ = & t^J(\text{full model}) - t^J(\mathrm{r} = \bar{\mathrm{r}}) & \text{policy bundle effect} \\ + & t^J(\mathrm{r} = \bar{\mathrm{r}}) - t^J(\mathrm{r} = \bar{\mathrm{r}}, \rho = \rho_{\min}) & \text{anti-solidarity effect.} \end{array} \tag{32}$$

One could say that the degree of redistribution *sans* the anti-solidarity effect and the policy bundle effect is what democratic politics would produce in the United States if the polity were as racially homogeneous as, let us say, Norway was before 1970.

We conclude this section with a methodological remark. Consider the utility function (24) and suppose that an individual derives from the policy of party J the random utility of

$$v^J = \tilde{\phi}(t^J, w) - \frac{\gamma}{2}(r^J - \rho)^2 + (\delta_0 - \delta_2\rho)\tilde{E}(t^J) + \varepsilon^J, \tag{33}$$

where J=D, R is an index for a party, and ε^J is a random error term. Then at the observed vector of platforms $(t^D_{obs}, t^R_{obs}, r^D_{obs}, r^R_{obs})$ (see below), the individual will vote party R if and only if

$$\begin{aligned} \varepsilon^D - \varepsilon^R < -\left[\tilde{\phi}(t^D_{obs}, w) - \tilde{\phi}(t^R_{obs}, w)\right] + \frac{\gamma}{2}\left[(r^D_{obs} - \rho)^2 - (r^R_{obs} - \rho)^2\right] \\ - \delta_0[\tilde{E}(t^D_{obs}) - \tilde{E}(t^R_{obs})] + \delta_2\rho[\tilde{E}(t^D_{obs}) - \tilde{E}(t^R_{obs})]. \end{aligned} \tag{34}$$

Note that $(r^D_{obs} - \rho)^2 - (r^R_{obs} - \rho)^2$ can be expanded into $2(r^D_{obs} - r^R_{obs})(\frac{r^D_{obs} + r^R_{obs}}{2} - \rho)$. Rearranging terms of (34) while using this expansion, we have

$$\varepsilon^D - \varepsilon^R < \left[\tilde{\phi}(t^R_{obs}, w) - \tilde{\phi}(t^D_{obs}, w)\right] + [\delta_2(\tilde{E}(t^D_{obs}) - \tilde{E}(t^R_{obs})) - \gamma(r^D_{obs} - r^R_{obs})]\rho + \text{constant} \qquad (35)$$

The first term on the right-hand side of expression (35) is a function of w while the second term is a function of ρ. If one assumes that the term $\left[\tilde{\phi}(t^R_{obs}, w) - \tilde{\phi}(t^D_{obs}, w)\right]$ can be approximated by a linear (or log-linear) function of income and other demographic variables such as education, and $\varepsilon^* \equiv \varepsilon^D - \varepsilon^R$ is distributed by a distribution function Φ, one may be able to run a binary choice regression model with variables measuring income, racial position, and other controls.

But as is clear from equation (35), what can be estimated is the size of $\delta_2(E(t^D_{obs}) - E(t^R_{obs})) - \gamma(r^D_{obs} - r^R_{obs})$. This is an identification problem in econometrics, but points out an important issue in empirical studies on the politics of race. Many empirical researchers set similar specifications to (35) to determine the effect of 'racism' on voting behavior, and our regression (6) in Table 2-1 is also of this type. But as equation (35) shows, the coefficient of ρ combines two effects (the policy bundle effect and the anti-solidarity effect), because it involves both δ_2, associated with the anti-solidarity effect, and γ, associated with the policy bundle effect.

4. Estimation of the data in the model

We estimate the parameter values of the utility function, marginal tax rates and transfer payments, the joint distribution of voter traits, and the observed policies of the two parties, etc., using two sources of micro data: the Panel Study of Income Dynamics (PSID) and the National Election Studies (NES). Our discussion will be brief, highlighting only the important issues. Details of our estimation procedure are described in Appendix 4.

Estimation of densities of voter types and thus our numerical computation is based upon four sets of data pooled over two adjacent election years; 1976-80, 1980-84, 1984-88, and 1988-92. The reason for pooling is twofold. First, having accurate density estimates for the distribution of voter types is very important for improving the fit of our model; a small number of samples will increase the bias of our non-parametric density estimates significantly. Second, by pooling samples in two adjacent election years, we have relatively *stable* results that will not be driven by year-specific political issues (e.g., candidate personality), which we did not model.

Other parameter values are estimated for each election year (Table A-4-3 in Appendix 1), but the average values of two years are applied to each of pooled data in numerical computation.

In our model, voters are characterized by a trait vector $(\hat{w}, \rho)$. We define ρ to be the racism-induced aid-to-blacks that we constructed in section 2. Because racial attitudes are not significantly influenced by income, we estimate the joint distribution of voter traits by estimating $f(w)$ and $g(\rho)$ separately.[6] In the estimation of densities, we apply the Rosenblatt-Parzen kernel density estimation

[6] We do not find a significant difference of the conditional densities $g(\rho \mid w)$ across income groups. (See Figure A-4-2 in Appendix 1.) We formally tested the independence assumption using two non-parametric test statistics. First, we compute the Kolmogorov-Smirnov similarity statistic (see Appendix 3) for each pair of conditional densities to see whether they differ across income groups. (The computed KS statistics and p-values are presented in Table A-4-4 in Appendix 1.) Except in a few cases, we were unable to reject the hypothesis that a pair of two conditional densities is identical. Second, we calculate the T_1 statistic suggested by Ahmad and Li (see Pagan and Ullah (1999; p.71) and Appendix 3 in this paper); we were again unable to reject the null hypothesis of independence against the alternative of dependence. Indeed estimating a fully bivariate density when the correlation between the two variables is very weak does more harm than good, because kernel estimates of joint densities are in general inaccurate unless the sam-

method. (See Appendix 3 for details.) The real wage rate is the nominal representative wage rate, estimated from the PSID using only SRC sample with positive taxable incomes, adjusted by the Consumer Price Index (1984=100).

Figure 4-1 shows the estimated densities of ρ, while Figure A-4-1 in Appendix 1 shows the estimated densities of $\hat{w}$ and ρ, together with the 95% asymptotic confidence intervals for their marginal densities; the marginal densities are quite tightly estimated.

[Figure 4-1 about here]

We also computed the observed marginal tax rates and transfer payments (t_{obs} and b_{obs}) by regressing post-fisc family income on pre-fisc family income with a constant term. (Thus the slope coefficient is *(1-t)* and the constant corresponds to *b.*) The regression results are reported in Table 4-1.

[Table 4-1 about here]

Te linear fit is extremely good. The R^2 is higher than 0.90 in almost all years, and the regression with the quadratic or cubic terms does not add much explanatory power. We compared our linear fit with non-parametric fits based on locally weighted smoothing (lowess) with two different bandwidths (0.2 and 0.8); one cannot tell the difference between them except in the range where very few high income samples exist as outliers. (See Figure A-4-4 in Appendix 1.)

The marginal tax rates increase until 1980, and then decline gradually. As the marginal tax rates decline over time, the transfer payments also decline in real terms. As the last column of Table 4-1

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ple size is large. Silverman (1986; pp. 92-3) describes the 'empty-space phenomenon' where very few points are around the origin when the dimension is greater than 1.

indicates, the transfer payments calculated in real terms using the Consumer Price Index declined from \$6609.9 in 1976 to \$5295.6 in 1990.

The parameter vector that characterizes the labor supply functions, $(\beta_M, \beta_F, \lambda_M, \lambda_F)$ was estimated using those estimates of uncompensated wage elasticities of labor supply estimated by Hausman (1981) and Triest (1990). (See Appendix 4 for details.)

Once the distribution of voter types and parameter values for the sub-utility function are estimated we can estimate the Laffer curve in the model. Figure 4-2 shows the estimated Laffer curves together with the observed policy pair (t_{obs}, b_{obs}) (estimated by the average value of two years). We also computed, by a bootstrapping method, the asymptotic confidence interval of the Laffer curve by considering only the estimation errors inherited from the estimation of the wage distribution.[7]

The solid line represents the Laffer curve based on our non-parametric estimation of the wage distribution. The fit of our model is remarkably accurate; the observed fiscal policy (the large dot) lies very close to the estimated Laffer curve for all periods! For the sake of comparison, we also estimated the Laffer curve based on the lognormal wage distribution function, two parameters of which are estimated from the data (the dotted curve) by minimizing the L_2-norm of the difference between the lognormal density and the kernel density. Supremacy of the non-parametric estimation method is clear. The tax rate that maximizes the Laffer curve is about 0.71-0.74, which is very high.

[Figure 4-2 about here]

Observed vote shares (φ_{obs}) are easy to obtain but observed racial policies (r^D_{obs} and r^R_{obs}) and fiscal policies (t^D_{obs} and t^R_{obs}) of the two parties are difficult to estimate. The NES provides informa-

[7] The bootstrap sample size is 1000. The actual confidence interval would be wider than shown here if we considered estimations errors inherited from parameter values.

tion on the public perception about the presidential candidates' position on aid-to-blacks (see Figure A-2-2 in Appendix 1). Assuming that voters are perceptive, we simply took the mean values as the candidates' positions on the racial issue (r^D_{obs} and r^R_{obs}). The tax rates 'announced' by parties are rarely observable. We simply assume that the observed fiscal policy before the enactments of the two major Reagan tax reforms is the announced policy of party D, whereas the policy after the reforms is the announced policy of party R. Indeed, the fiscal system in the US was basically unchanged between the New Deal and the early 1980s. Thus we set $t^D_{obs} = 0.372$ and $t^R_{obs} = 0.2793$.

We apply equation (35) to estimate $(\delta_0, \delta_2, \gamma)$. But recall that we cannot estimate all these parameters with regression techniques because of an identification problem. First, we can only estimate the size of $\delta_2(E(t^D_{obs}) - E(t^R_{obs})) - \gamma(r^D_{obs} - r^R_{obs})$, which gives a linear relationship between δ_2 and γ. Second, we cannot estimate δ_0 because it is absorbed into the constant term.

To further reduce the dimension of the parameter space, we impose the following condition: $\varphi(t^D_{obs}, t^R_{obs}, r^D_{obs}, r^D_{obs}; \delta_0, \delta_2, \gamma) = \varphi_{obs}$. (Thus we have one degree of freedom in the choice of parameters.[8]) The justification for this constraint is that our full model must be correctly specified at least in one aspect, to make our counterfactual experiments meaningful. As we have seen earlier through the tight fit of the Laffer curve (Figure 4-2), our model is very well specified on the economic side.

5. Numerical solution of the model

[8] This constraint is not tautological, because we are imposing the condition that the vote share our model predicts at the *observed* platform be equal to the observed vote share.

With those parameters and density functions estimated in section 4, we carry out the computation separately for 4 periods: 1976-80, 1980-84, 1984-88, and 1988-1992. Finding equilibrium values for all three models requires about 1000 iterations for each set of parameter values in each period. Details of the computation procedure are explained in Appendix 4.

Table 5-1 shows the results obtained by this procedure when $\delta_0 = 1$ for all periods. The expected tax rate is the average of the tax rates of the two parties, weighted by the vote share that each party gets.

[Table 5-1 about here]

First, we remark that the equilibrium prediction in the full model is very close to the observed values; as well, the time series pattern is close to the historical trend reported in Table 4-1. For instance, the expected tax rate at the equilibrium changes from 29.3% in 1976-80 to 34.65% in 1980-1984, and then declines afterwards up to 28.7% in 1988-92. This is remarkable, because we only imposed the specification condition that the vote share predicted by our model at the observed platforms be equal to the observed vote share.

Because the expected tax rate is determined by three factors – the vote share, the tax rate proposed by party D, and the tax rate proposed by party R – looking only at the expected tax rate may not be enough. So we examined each of these factors separately.

The equilibrium tax rates are differentiated between the two parties. The tax rate proposed by the Democratic Party is usually 12-16% higher than that proposed by the Republican Party. In 1984-88, for instance, the Democratic Party proposes a marginal tax rate of 37% while the Republican Party proposes a tax rate of 23.9%, which is close to the observed tax rates that we postulated in section 4.

The equilibrium vote share of party D is also close to the historical vote share, although its prediction is poor in 1980-84. Our equilibrium prediction is that the vote share for the Democratic Party in that period is greater than 50%, although the Republican Party won that election.

One reason for inaccuracy in some years is because the true value of δ_0, which we are unable to identify, may not be equal to 1 for these years. Nevertheless, we believe that the level of prediction accuracy achieved by a model that controls only two dimensions of American political life is high.

The effect of racism on redistribution in the United States is large. We predict that the Republican Party would have proposed a marginal tax rate of 40% in 1984-88, absent racism. Due to the existence of racism, however, the Republican Party was able to propose a tax rate of 23.9% in this period; thus the effect of racism on the tax rate is about 16.5 % in 1984-1988 for the Republican Party. The effect of racism on the tax rate of the Democratic Party is also large. Absent racism, we predict party D would have proposed a marginal tax rate of 49.9%; due to the existence of racism, it proposed 37%.

The fact that the total effect of racism appears to be large for both parties implies that voter racism pushes both parties in the United States *significantly to the right* on the economic issue. Absent race as an issue in American politics, the fiscal policy in the USA would look quite similar to fiscal policies in Northern Europe.

Although the total effect is large for both parties, the composition of the total effect differs between the two parties; see Table 5-1. In terms of the tax policy, the policy bundle effect is bigger than the anti-solidarity effect for the Republican Party whereas the anti-solidarity effect is bigger for the Democratic Party. In 1980-84, for example, for party D, 82% of the total effect of racism on the tax rate is attributed to the anti-solidarity effect.

The effect of racism on redistribution varies across time, reflecting changes in the distribution of voter traits. In terms of the expected tax rate, the smallest effect is in 1980-1984, where the distribution of racial views among citizens is least skewed and has the lowest mean.

The effect of voter racism on the *vote share* for party D is also very large. The biggest effect occurred in 1984-88 when the Democrats lost about 38% of vote share due to racism. We note that for some years (1980-84 and 1988-92) the anti-solidarity effect of voter racism *on vote share* is *positive* rather than negative. Recall that the vote shares are affected through two channels: the direct channel mediated through changes in parameter values and the indirect channel through changes in equilibrium platforms. Indeed when we compute the vote share while fixing the platform at the value obtained from the full model, the two effects of voter racism on D vote share is always negative; the indirect effect induced by the platform change has a large influence on the vote share.

Another way of looking at the significance of the policy bundle effect is to examine the equilibrium party membership. (Recall that our model determines party memberships endogenously, together with the equilibrium policy vectors.) In Figure 5-1, we have drawn the party membership separation hyper-space, together with the observed membership distribution of voter types, for three models: the full model and the two counterfactual models.

[Figure 5-1 about here]

Figure 5-1(a) shows that party membership is more sensitive to voters' racial positions than to their economic positions. The hyper-space that separates the type space into the two parties is negatively sloped in the full model but the slope is small. Figures 5-1(b) and 5-1(c) indicate that, were the race issue not a dimension of political competition, citizens would be partitioned into parties more according to their economic position rather than their racial position.

Alternatively phrased, our model predicts an alignment of political parties in the US primarily along the racial issue, in the sense that party membership is best characterized by a partition of the space of voter types which differentiates citizens according to their racial views, not their incomes. If, somehow, the race issue were to disappear from politics, there would be realignment so that membership would be defined primarily by differentiation of voters along the economic dimension. We take this difference between party identification in the multi- and unidimensional policy problems to be quite significant.

We next compare the equilibrium separation of citizens into the two parties, determined by the model, with the real party identification estimated from the actual data; Figure 5-2 shows the graph.

[Figure 5-2 about here]

Each cell in Figure 5-2 represents the type space, with the wage on the abscissa and racial view in the ordinate. In the graph we represent different densities of *observed* D party membership (i.e., the fraction voting D) across 25 discrete cells with different shades of gray; the darker the cell is, the higher the observed Democratic membership. Shown together with the density plots is the party separation graph $\rho = \Psi(w, \tau^D, \tau^D)$, the cutoff hyper-space for party membership in the model. Since there are many PUNEEPs, there are as many Ψ graphs as there are PUNEEPs. The graph of Ψ drawn in Figure 5-2 is based on the (weighted) mean value of the platform vector (τ^D, τ^R). If reality conformed perfectly to the model, then each of these graphs would be all black below the curve and all white above the curve. Albeit imperfect, the separation of party membership by the hyper-space is quite close to the actual separation of party membership.

Figure 5-2 shows the historical voter realignment more clearly than Figure 5-1. In 1976-1980 and 1980-84, the model predicts that many poor racist voters should have voted for the Democratic

Party. But these voters are shown to defect from the Democrats to the Republicans gradually, and in 1984-88, poor racist voters no longer vote Democratic. In 1988-1992, poor voters again should vote Democratic, but this is not because the slope of the voter separation curve has changed; the slope of the curve is quite similar. Rather it is mainly because the curve itself has shifted up.

6. Conclusion

We conclude that both the policy bundle effect and anti-solidarity effect of racism on fiscal policy are significant and negative in this period. Voter racism pushes both parties in the United States significantly to the right on economic issues.

Our analysis provides a very different perspective on the importance of the race issue in American politics than those of Poole of Rosenthal (1997) and McCarty, Poole, and Rosenthal (2003), who argue that, although race has sometimes been a significant second issue, it is of only marginal significance. The Poole-Rosenthal-McCarty analysis, as it is not based on an equilibrium model, is unable to postulate counterfactual histories. Indeed Figures 5-1 and 5-2 show how radically the partition of the set of types into two parties would change were race to cease to be an issue. With the race issue present, the D-R party partition is defined very sharply with respect to racial views, and much less sharply with respect to income class. Thus a unidimensional (economic) model of American politics gravely mischaracterizes the nature of political competition.

Indeed the historical observation that the United States experienced increasing income inequality *and* significant tax cuts since the 1980s raises one puzzle to the well known claim of unidimensional Downsian models, that the equilibrium tax rate is positively correlated with inequality. If the dimension of income had become more and more important in determining the voting pattern, how could one explain that the equilibrium tax rates have been declining in the period of rising inequality?[9] The current paper provides an answer to this question: the existence of a non-economic dimension, such as race, changes the alignment of voters in a significantly different way from that predicted by one dimensional models.

Our analysis also provides a different perspective on the importance of the race issue in American politics than that of Alesina et al. (2001). These authors attribute the effect of racism largely to what we call the anti-solidarity effect, but we have shown that the policy bundle effect is non-negligible. As we indicated in section 3.F, attributing the magnitude of the coefficient on the racism variable to the anti-solidarity effect significantly overestimates its importance.

The research strategy employed in the current paper might be fruitfully employed for other countries. In Europe, with the exception of the UK, the influx of people of color has, in large part, been a phenomenon of the last forty years, via immigration from Asia, Asia Minor, and Africa. There have recently emerged, in several countries, politically significant movements and parties, which are anti-immigrant and xenophobic: Le Pen in France is the best known, but one must also mention Austria, the Netherlands, Denmark, and Switzerland. Indeed, the phenomenon of ethnocentrism or xenophobia is 'realigning' voters in these countries; many who used to vote Left are now voting for the new Right. In particular, many unskilled white workers, who feel most threatened by immigration, globalization and skill biased technological change, have switched their allegiance. In future work, we will examine how the anti-solidarity effect and the policy bundle effect differ across countries.

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[9] This does not mean that there have been no attempts at explaining the disparity between the theoretical prediction of the Downsian models and the historical observation. Bénabou and Tirole (2002) show that beliefs in a just world may affect redistribution politics in a significant way. Piketty (1996) show how the perception about social mobility can affect the equilibrium outcome.

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Table 2-1: Determinants of whites' racial and political attitudes (Source: NES)

	(1)OLS	(2)OLS	(3)OPROB	(4)PROB	(5)PROB	(6)PROB
	7pt aid-to-blacks scale 1=pro ... 7=con	blacks must try harder 1=agree ... 5=disagree	how much has position of negro changed 1=not much ... 3=a lot	defectionD	defectionR	presvoteR
racism	0.539** (15.93)	-0.436** (12.88)	0.293** (9.17)	0.256** (3.34)	-0.122+ (1.69)	0.311** (6.90)
libertarianism	0.192** (5.71)	0.027 (0.74)	-0.051+ (1.74)	-0.003 (0.04)	-0.069 (1.10)	0.023 (0.56)
compassion	-0.344** (9.39)	0.137** (3.74)	-0.012 (0.40)	-0.192* (2.54)	0.069 (0.98)	-0.240** (5.52)
feminism	-0.343** (9.80)	0.240** (6.37)	-0.066* (2.16)	-0.303** (4.11)	0.206** (2.61)	-0.415** (9.17)
incomevalue10k	0.001* (2.20)	-0.000 (0.68)	-0.001 (1.19)	0.003+ (1.94)	-0.001 (0.55)	0.002** (3.05)
education==1	0.380+ (1.81)	-0.971** (4.66)	0.253 (1.61)	-0.029 (0.08)	0.018 (0.03)	-0.258 (1.05)
education==2	0.375** (4.47)	-0.648** (7.30)	0.283** (3.75)	0.089 (0.48)	0.294+ (1.74)	-0.045 (0.42)
education==3	0.289** (3.54)	-0.322** (3.42)	0.121 (1.57)	0.233 (1.26)	0.122 (0.74)	0.133 (1.26)
upmobile	0.039 (0.46)	0.003 (0.03)	0.035 (0.48)	0.519** (2.84)	0.095 (0.59)	0.189+ (1.75)
downmobile	0.192 (1.27)	0.207 (1.14)	-0.004 (0.03)	0.057 (0.16)	0.342 (1.26)	0.294 (1.56)
pastecon-omy*incumbentisD				0.096 (0.88)		
pastecon-omy*incumbentisR					0.199** (3.40)	-0.244** (6.79)
respondent age	0.000 (0.07)	0.004 (0.69)	0.004 (0.95)	0.243+ (1.75)	-0.006 (0.04)	0.115 (1.38)
pre_crm_cohort	-0.195 (1.47)	-0.151 (1.02)	0.069 (0.57)	-0.003 (0.02)	-0.137 (0.94)	0.109 (1.23)
post_crm_cohort	-0.083 (0.76)	0.027 (0.22)	-0.080 (0.81)	-1.033+ (1.85)	0.201 (0.59)	-0.285 (1.29)
femaledummy	-0.064 (0.96)	-0.019 (0.27)	-0.101+ (1.72)	-0.300+ (1.80)	-0.118 (0.64)	-0.276** (2.67)
marrieddummy	-0.059 (0.81)	-0.043 (0.59)	0.016 (0.25)	-0.037 (0.39)	-0.227** (2.66)	0.203** (3.78)
unemployeddummy	0.011 (0.07)	-0.185 (1.23)	-0.169 (1.36)	-0.018+ (1.78)	-0.004 (0.41)	-0.005 (0.76)
unionmemdummy	0.058 (0.71)	-0.155+ (1.77)	-0.040 (0.55)	0.227 (0.83)	-0.025 (0.09)	0.053 (0.32)
protestantism	-0.004 (0.10)	0.045 (1.00)	-0.019 (0.48)	-0.362 (1.56)	-0.005 (0.02)	-0.168 (1.19)
region==2 (Mid-west)	0.118 (1.29)	0.112 (1.18)	0.060 (0.73)	-0.285 (1.43)	0.160 (0.80)	0.074 (0.62)
region==3 (South)	0.206* (2.09)	0.006 (0.06)	0.288** (3.23)	-0.052 (0.26)	-0.195 (0.89)	0.127 (1.01)
region==4 (West)	0.018 (0.18)	0.293** (2.80)	0.097 (1.10)	-0.096 (0.50)	0.113 (0.55)	-0.031 (0.25)
Observations	1905	986	1697	537	595	1234
Covered years	all	88,92	76,84,88,92	80,84,88,92	80,84,88,92	80,84,88,92
R-squared	0.25	0.28				

Robust t statistics for OLS and z statistics for OPROB (Ordered Probit)and PROB in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%
Year dummies and constant are controlled but not reported here.

Table 4-1: Estimation of marginal tax rates and transfer payments (Source: PSID)

Year	Source	b	(1-t)	R^2	Obs	Marginal tax rate	CPI-adjusted transfers (1984=100)
1971	PSID 1972	2230.54 (42.41)	0.6927 (172.95)	0.9174	2695	0.3073	5953.1
1972	**PSID 1973**	**2341.2 (44.94)**	**0.6926 (185.7)**	**0.9268**	**2725**	**0.3074**	**5819.3**
1975	PSID 1976	3379.2 (51.63)	0.6481 (175.98)	0.9119	2995	0.3519	6525.9
1976	**PSID 1977**	**3619.9 (52.33)**	**0.6504 9(183.22)**	**0.9161**	**3077**	**0.3496**	**6609.9**
1979	PSID 1980	4938.8 (48.72)	0.6246 (157.33)	0.8828	3288	0.3754	7067.9
1980	**PSID 1981**	**5198.7 (50.81)**	**0.6278 (167.26)**	**0.8955**	**3268**	**0.3722**	**6555.0**
1983	PSID 1984	5643.9 (44.38)	0.6820 (197.5)	0.9202	3386	0.3180	5887.7
1984	**PSID 1985**	**5807.7 (45.97)**	**0.6796 (219.06)**	**0.9338**	**3405**	**0.3204**	**5807.7**
1987	PSID 1988	5920.1 (39.24)	0.7102 (229.18)	0.9378	3485	0.2898	5414.5
1988	**PSID 1989**	**6273.3 (39.44)**	**0.7192 (233.07)**	**0.9398**	**3479**	**0.2808**	**5509.8**
1990	**PSID 1991**	**6661.1 (38.21)**	**0.7207 (234.08)**	**0.9397**	**3518**	**0.2793**	**5295.6**

Note: (1) The estimation is based on the following linear regression:

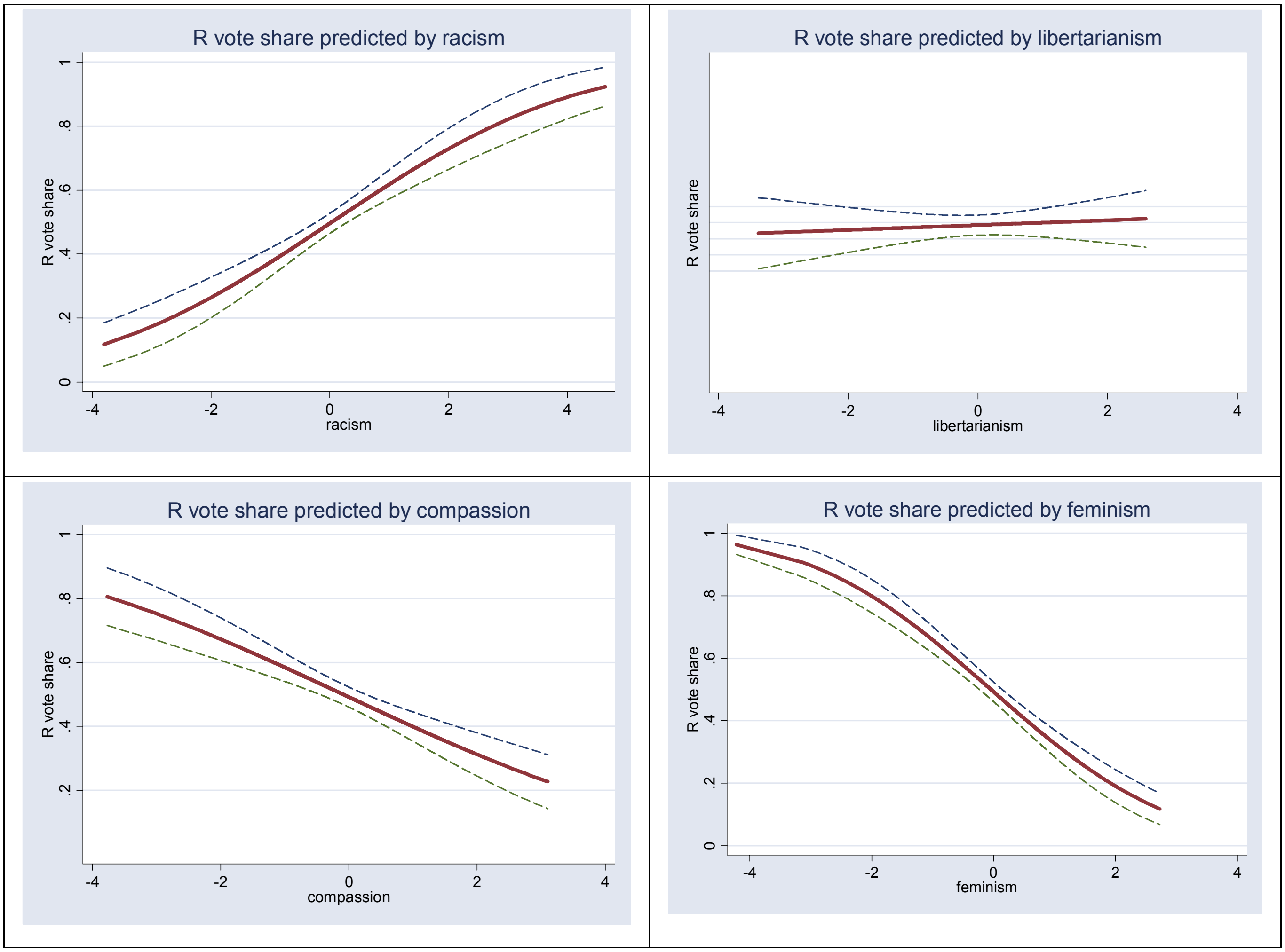
$$(\text{Post - fisc income}) = b + (1-t)(\text{Pre - fisc income}) .$$

(2) Numbers in parentheses are t-values.

Table 5-1: PUNEEPs and the decomposition of racism effect ($\delta_0 = 1$)

1976-80	Full	r=rbar	r=rbar, ρ=ρrmin	Total effect	PB	AS	PB (%)	AS (%)
αD (mode)	0.5421							
αR (mode)	0.1940							
tD	0.3473	0.3791	0.4824	0.1351	0.0318	0.1033	23.54%	76.46%
tR	0.2212	0.3432	0.4450	0.2238	0.1220	0.1018	54.51%	45.49%
RD	2.7663							
RR	4.1144							
Exp tax rate	**0.2927**	**0.3696**	**0.4742**	**0.1815**	0.0769	0.1046	42.36%	57.64%
Vote share	0.5166	0.7351	0.7814	0.2648	0.2185	0.0463	82.52%	17.48%
# of PUNEEP	9	45	26					
1980-84	Full	r=rbar	r=rbar, ρ=ρrmin	Total effect	PB	AS	PB (%)	AS (%)
αD (mode)	0.5932							
αR (mode)	0.2214							
tD	0.4025	0.4137	0.4666	0.0641	0.0112	0.0529	17.47%	82.53%
tR	0.2129	0.3638	0.4391	0.2262	0.1509	0.0753	66.71%	33.29%
RD	3.4307							
RR	3.7914							
Exp tax rate	**0.3465**	**0.4011**	**0.4567**	**0.1102**	0.0546	0.0557	49.48%	50.52%
Vote share	0.5609	0.7466	0.6417	0.0808	0.1857	-0.1049	229.83%	-129.83%
# of PUNEEP	11	42	19					
1984-88	Full	r=rbar	r=rbar, ρ=ρrmin	Total effect	PB	AS	PB (%)	AS (%)
αD (mode)	0.5545							
αR (mode)	0.4909							
tD	0.3709	0.3859	0.4993	0.1284	0.0150	0.1134	11.68%	88.32%
tR	0.2392	0.3234	0.4042	0.1650	0.0842	0.0808	51.03%	48.97%
RD	2.7771							
RR	3.6483							
Exp tax rate	**0.3109**	**0.3659**	**0.4699**	**0.1590**	0.0550	0.1040	34.61%	65.39%
Vote share	0.4049	0.6804	0.7906	0.3857	0.2755	0.1102	71.43%	28.57%
# of PUNEEP	23	52	15					
1988-92	Full	r=rbar	r=rbar, ρ=ρrmin	Total effect	PB	AS	PB (%)	AS (%)
αD (mode)	0.5529							
αR (mode)	0.0705							
tD	0.3154	0.3320	0.4409	0.1255	0.0166	0.1089	13.23%	86.77%
tR	0.1504	0.3004	0.4030	0.2526	0.1500	0.1026	59.38%	40.62%
RD	2.8738							
RR	4.1953							
Exp tax rate	**0.2870**	**0.3241**	**0.4270**	**0.1400**	0.0371	0.1028	26.53%	73.47%
Vote share	0.5797	0.7508	0.6320	0.0523	0.1711	-0.1188	327.15%	-227.15%
# of PUNEEP	15	36	11					

Figure 2-1: Changes in the predicted R vote share with respect to changes in 4 core ideologies based on a probit regression (column (6)) of Table 2-1



Note: (1) Graphs are based on the estimated coefficients reported in column (6) of Table 2-1. We fixed all other variables at their mean values.

(2) Thin dotted lines around the thick solid lines are upper and lower bounds of 95% asymptotic confidence intervals. The asymptotic standard errors of the predicted R vote shares are computed using a delta method (see Greene, W., 2000, *Econometric Analysis*, 4th edition, New York, NY: Prentice Hall, p. 824).

Figure 4-1: Distribution of racial policy attitude: Whites only (Source: NES)

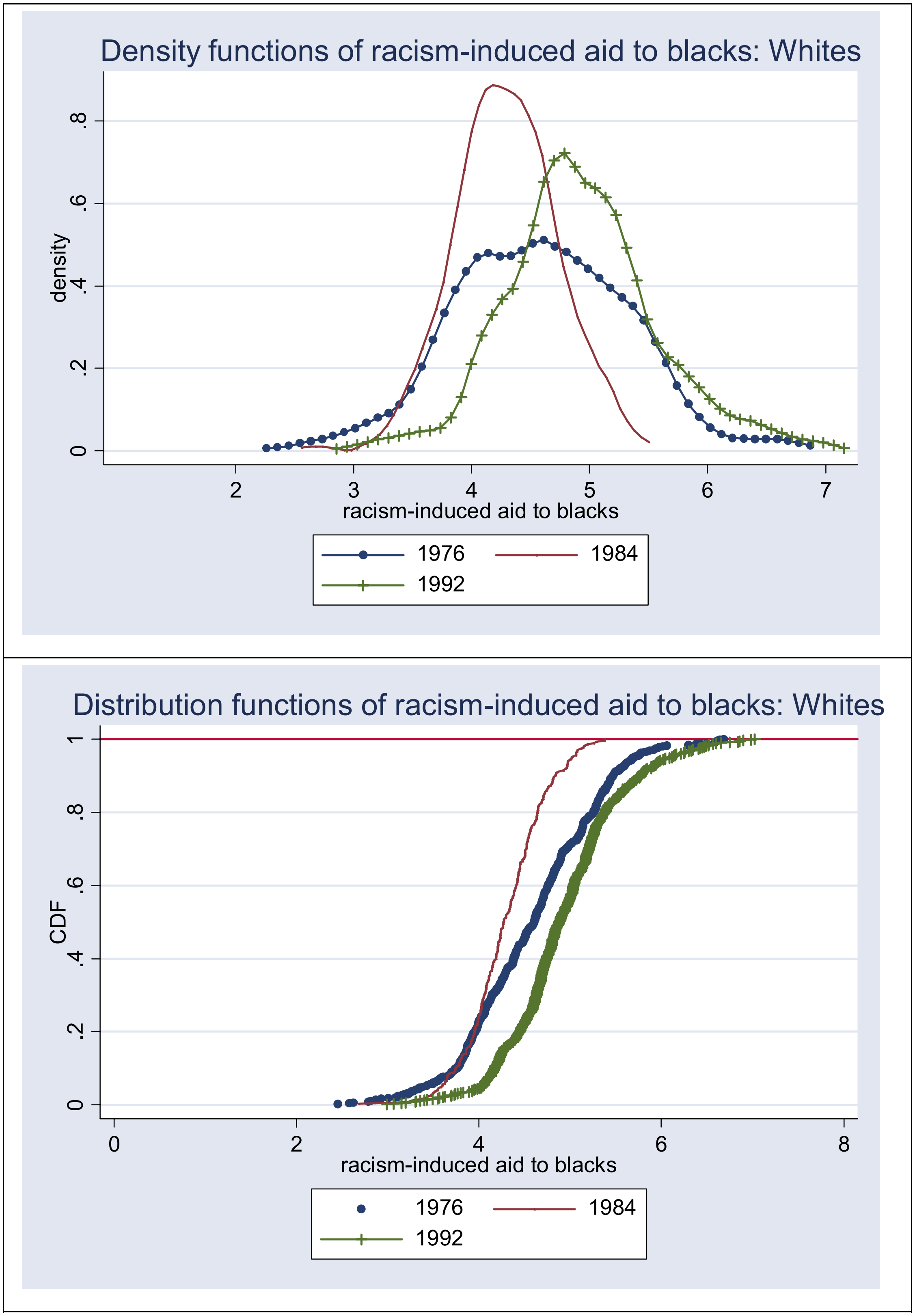
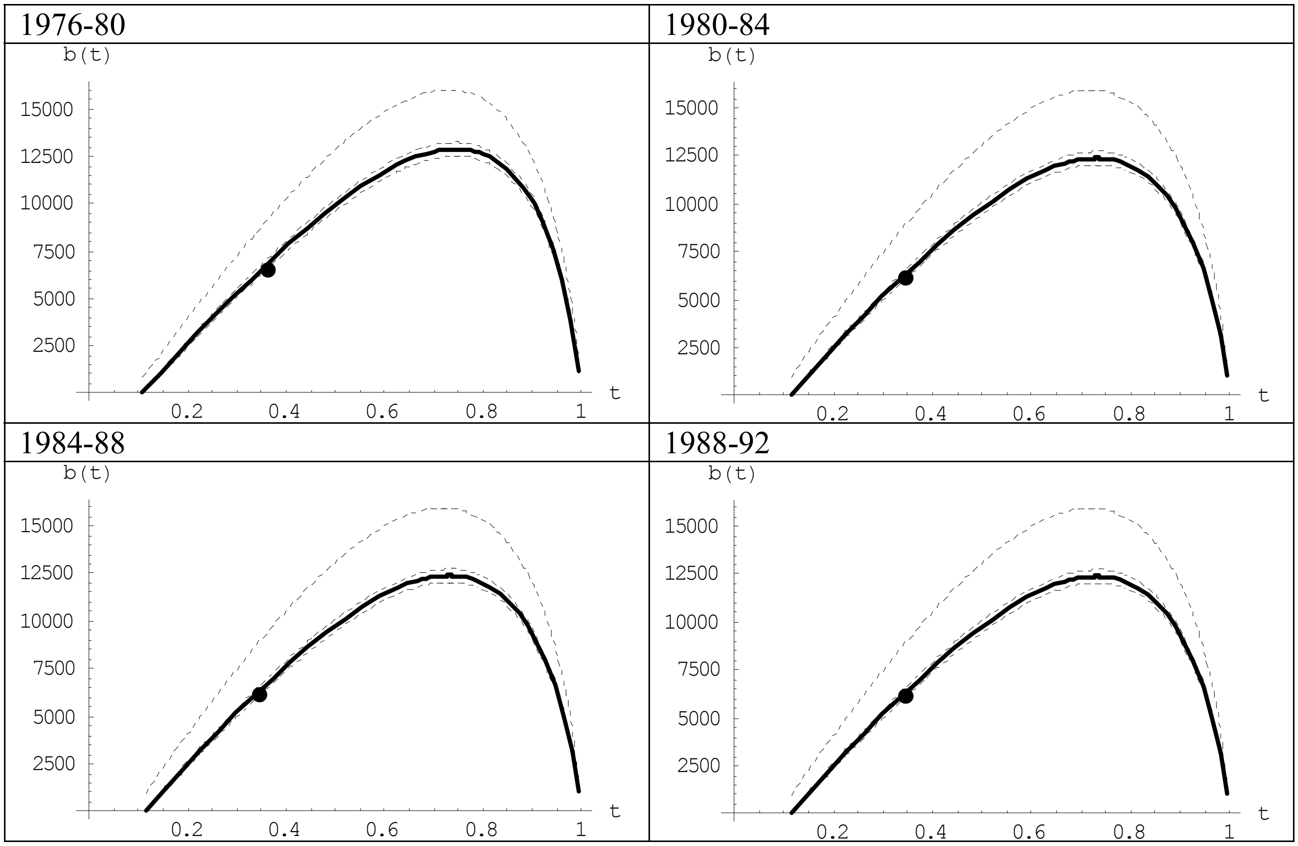


Figure 4-2: The estimated transfer function (Laffer curve), the function *b(t)*



Note: (1) The solid line represents the estimated Laffer curve when the wage distribution is estimated non-parametrically. The dotted line represents the estimated Laffer curve when the wage distribution is assumed to be lognormal and its two parameters are estimated by minimizing the L_2 -norm of the difference between the lognormal density and the kernel density.

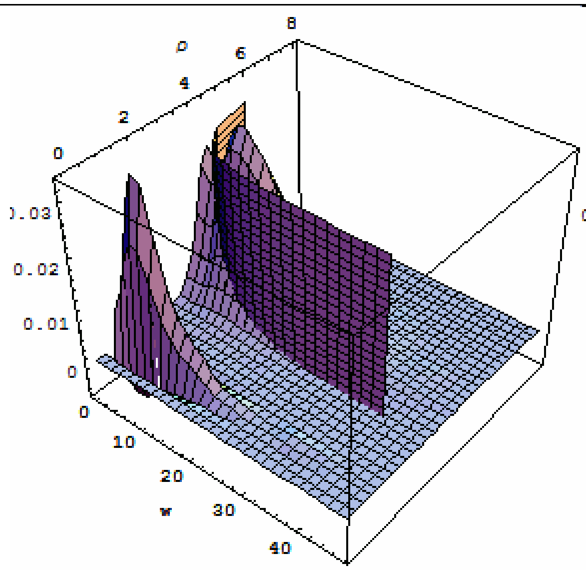
(2) The big black dot in the graph represents (t_{obs}, b_{obs}) estimated from the data in section 4. (See Table A-4-3 in Appendix 1.)

(3) The precise values of b_{obs} and $b(t_{obs})$, and t_{max} for other years are as follows:

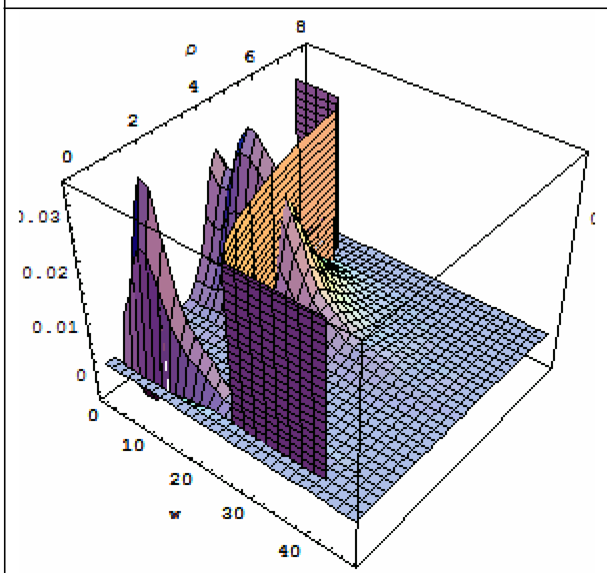
	76-80	80-84	84-88	88-92
b_{obs}	6582.45	6181.35	5685.75	5402.70
$b(t_{obs})$	6815.52	6353.38	5860.17	5459.48
t_{max}	0.745	0.732	0.714	0.711

Figure 5-1: Equilibrium Party membership at PUNEEPs: 1984-1988

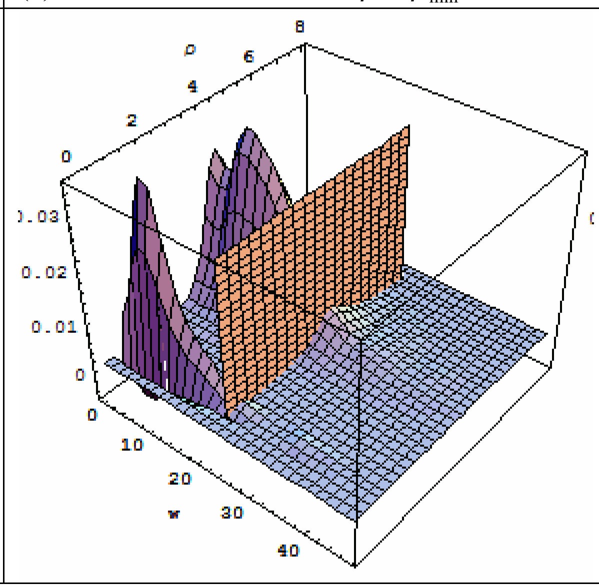
(a) Full model



(b) Model with $r = \bar{r}$



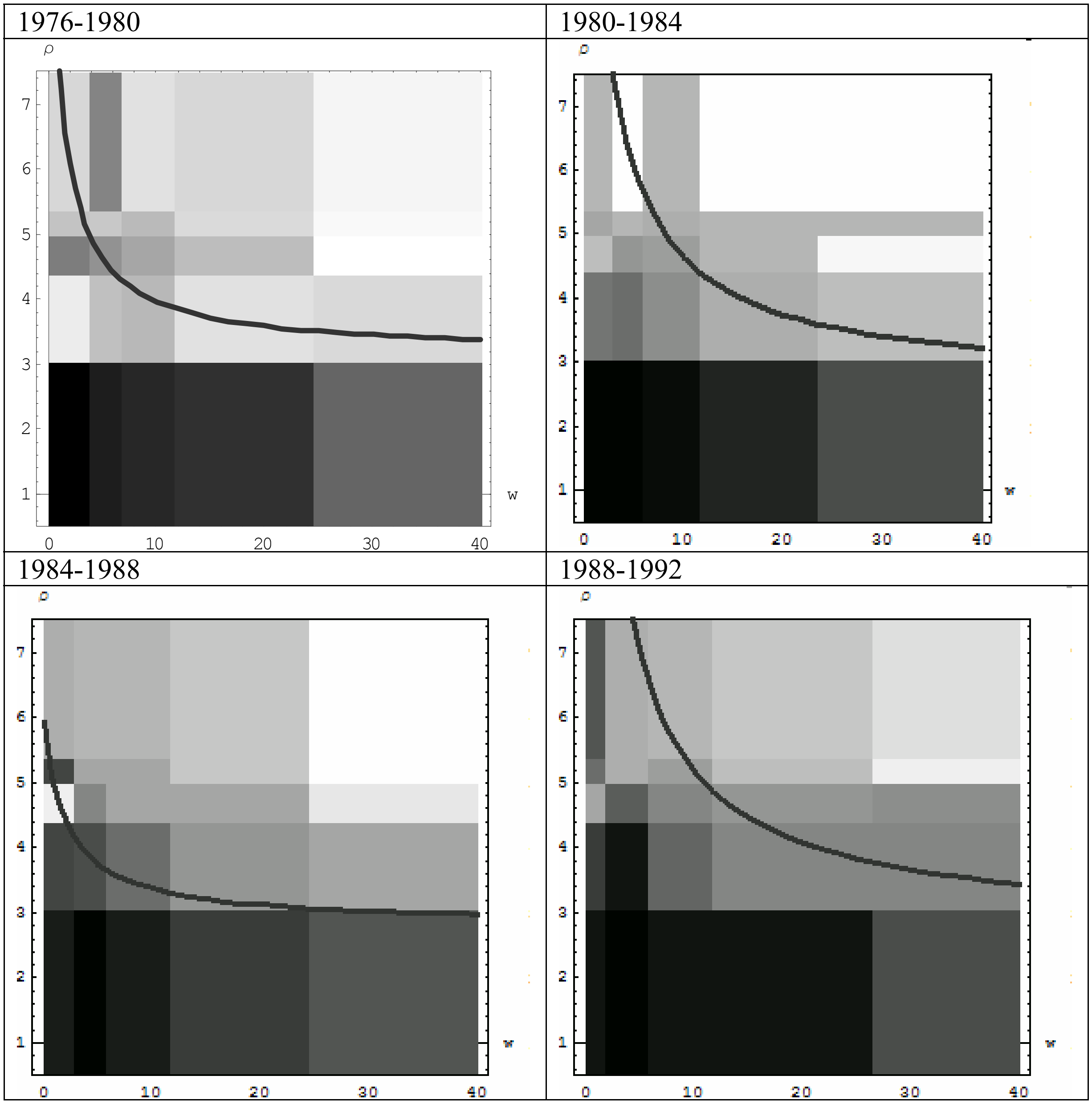
(c) Model with $r = \bar{r}$ and $\rho = \rho_{min}$



Note: (1) Voter separation hyperplanes are drawn at the mean value of equilibrium policy vectors.

(2) Parameter values for these graphs are: $\delta_0 = 1, \delta_2 = 0.1508, \gamma = 0.3559$.

Figure 5-2: Equilibrium and observed party membership



Note: (1) Parameter values for these graphs are:

	76-80	80-84	84-88	88-92
δ_0	1	1	1	1
δ_2	0.0640	0.0955	0.1508	0.0787
γ	0.1584	0.2999	0.3559	0.1632

(2) Shades of gray represent the density plot of observed D party membership computed from actual data; the darker the cell is, the higher the observed membership.
(3) The downward sloping curves represent the equilibrium party separation graph in the model.

Appendices for Referees (Not for publication)

Appendix 1: Other tables and figures

Table A-2-1: Voting fractions in the United States (Source: NES)

A. Entire population (Whites and Blacks)

		Fraction voting for				Net change from 1960-1964		
	Period	D	R	Third	Total	D	R	Third
All								
	1960-64	60.48	39.11	0.4	100			
	1968-72	37.24	57.83	4.92	100	-23.24	18.72	4.52
	1980-88	43.78	53.06	3.17	100	-16.7	13.95	2.77
	1992-96	47.9	37.85	14.26	100	-12.58	-1.26	13.86
Whites								
	1960-64	57.86	41.7	0.44	100			
	1968-72	32.22	62.51	5.27	100	-25.64	20.81	4.83
	1980-88	38.19	58.4	3.41	100	-19.67	16.7	2.97
	1992-96	42.68	41.6	15.72	100	-15.18	-0.1	15.28
Blacks								
	1960-64	93.06	6.94	0	100			
	1968-72	89.09	10	0.91	100	-3.97	3.06	0.91
	1980-88	91.16	7.18	1.66	100	-1.9	0.24	1.66
	1992-96	91.72	4.46	3.82	100	-1.34	-2.48	3.82

B. Whites only

		Fraction voting for				Net change from 1960-1964		
	Period	D	R	Third	Total	D	R	Third
Non-rich Whites	1960-64	61.76	37.83	0.41	100			
	1968-72	33.43	60.39	6.19	100	-28.33	22.56	5.78
	1980-88	42.32	54.63	3.05	100	-19.44	16.8	2.64
	1992-96	47.85	38.8	13.34	100	-13.91	0.97	12.93
Rich Whites	1960-64	52.97	46.53	0.5	100			
	1968-72	30.11	65.84	4.04	100	-22.86	19.31	3.54
	1980-88	32.26	64.02	3.72	100	-20.71	17.49	3.22
	1992-96	35.34	44.4	20.26	100	-17.63	-2.13	19.76
Uneducated Whites	1960-64	59.7	39.8	0.49	100			
	1968-72	32.52	61.7	5.78	100	-27.18	21.9	5.29
	1980-88	38.36	58.88	2.76	100	-21.34	19.08	2.27
	1992-96	45.3	37.44	17.26	100	-14.4	-2.36	16.77
Educated Whites	1960-64	42.31	57.69	0	100			
	1968-72	30.92	66.18	2.9	100	-11.39	8.49	2.9
	1980-88	37.62	57.04	5.34	100	-4.69	-0.65	5.34
	1992-96	38.52	48.98	12.5	100	-3.79	-8.71	12.5

Table A-2-2: Varimax-rotated factor loadings: Whites only (Source: NES)

1976 (obs.=497)

Variable	1 feminism	2 compassion	3 libertarianism	4 racism	Uniqueness
Antiblack affect	0.01822	-0.07963	-0.07387	**0.82937**	0.30001
Civil rights push too fast	-0.20691	0.0181	0.19432	**0.69206**	0.44015
Poor thermometer	-0.05059	**0.74197**	0.12747	0.01666	0.43039
Welfare thermometer	0.07812	**0.77161**	-0.08294	-0.19544	0.35343
Union thermometer	0.06135	**0.58147**	-0.40796	0.18032	0.45918
Strong government	0.08319	-0.05828	**0.7398**	0.07416	0.43688
Trust government	0.07357	-0.01298	**-0.70663**	0.00232	0.49509
Women equal	**-0.80756**	0.25927	0.0293	0.08598	0.27238
Women liberty thermometer	**0.81714**	0.24631	0.05921	0.02117	0.26766
Political Ideology	-0.54612	-0.19377	0.10397	0.22827	0.60128
Eigenvalues	2.03891	1.59067	1.1905	1.12346	
Difference	0.44824	0.40017	0.06704	0.23372	
Proportion	0.2039	0.1591	0.1191	0.1123	
Cumulative	0.2039	0.363	0.482	0.5944	

1992 (obs.=608)

Variable	1 feminism	2 compassion	3 anti-libertarianism	4 racism	Uniqueness
Antiblack affect	0.03785	-0.06921	0.01671	**0.86212**	0.25024
Civil rights push too fast	-0.37889	0.02574	-0.07252	**0.62184**	0.46384
Poor thermometer	-0.02324	**0.7910**	-0.05156	0.05249	0.36837
Welfare thermometer	0.09675	**0.7356**	-0.02186	-0.31366	0.35067
Union thermometer	0.13894	**0.68017**	0.20075	0.10673	0.46637
Strong government	-0.23476	-0.19503	**-0.67365**	0.04696	0.45084
Trust government	-0.06428	-0.05826	**0.85737**	0.01266	0.25723
Women equal	**-0.80464**	0.08237	0.01048	-0.08149	0.33902
Women liberty thermometer	**0.63397**	0.42618	0.10187	-0.13395	0.38814
Political Ideology	-0.71939	-0.13268	-0.03531	0.18314	0.43009
Eigenvalue	2.57095	1.39317	1.21693	1.05412	
Difference	1.17777	0.17624	0.16281	0.30858	
Proportion	0.2571	0.1393	0.1217	0.1054	
Cumulative	0.2571	0.3964	0.5181	0.6235	

Table A-2-3 (1): Determinants of whites' racial attitudes (Source: NES)

	(1)OLS	(2)OLS	(3)OLS	(4)OLS	(5)OLS	(6)OPROB
	7pt aid-to-blacks scale 1=pro ... 7=con	conditions make it difficult for blacks 1=agree ... 5=disagree	blacks should not have special favors 1=agree ... 5=disagree	blacks must try harder 1=agree ... 5=disagree	blacks gotten less than they deserve 1=agree ... 5=disagree	how much has position of negro changed 1=not much ... 3=a lot
Racism	0.539** (15.93)	0.423** (10.89)	-0.425** (13.32)	-0.436** (12.88)	0.468** (13.38)	0.293** (9.17)
Libertarianism	0.192** (5.71)	0.027 (0.67)	-0.031 (0.93)	0.027 (0.74)	-0.003 (0.10)	-0.051+ (1.74)
Compassion	-0.344** (9.39)	-0.189** (4.53)	0.163** (4.87)	0.137** (3.74)	-0.199** (5.45)	-0.012 (0.40)
Feminism	-0.343** (9.80)	-0.272** (6.46)	0.261** (7.58)	0.240** (6.37)	-0.255** (6.99)	-0.066* (2.16)
incomevalue10k	0.001* (2.20)	0.001+ (1.81)	-0.002** (3.08)	-0.000 (0.68)	0.001* (2.45)	-0.001 (1.19)
education1==1	0.380+ (1.81)	0.625** (2.65)	-0.942** (6.36)	-0.971** (4.66)	0.468* (2.28)	0.253 (1.61)
education1==2	0.375** (4.47)	0.366** (3.61)	-0.625** (7.42)	-0.648** (7.30)	0.309** (3.58)	0.283** (3.75)
education1==3	0.289** (3.54)	0.386** (3.78)	-0.431** (4.74)	-0.322** (3.42)	0.288** (3.19)	0.121 (1.57)
Upmobile	0.039 (0.46)	0.012 (0.12)	-0.017 (0.20)	0.003 (0.03)	-0.029 (0.34)	0.035 (0.48)
Downmobile	0.192 (1.27)	0.174 (0.69)	-0.094 (0.60)	0.207 (1.14)	0.186 (0.97)	-0.004 (0.03)
respondent age	0.000 (0.07)	-0.002 (0.31)	0.006 (1.28)	0.004 (0.69)	-0.009+ (1.77)	0.004 (0.95)
pre_crm_cohort	-0.195 (1.47)	-0.258 (1.55)	-0.416** (3.17)	-0.151 (1.02)	0.112 (0.79)	0.069 (0.57)
post_crm_cohort	-0.083 (0.76)	-0.243+ (1.69)	-0.003 (0.02)	0.027 (0.22)	-0.167 (1.36)	-0.080 (0.81)
Femaledummy	-0.064 (0.96)	-0.034 (0.43)	0.000 (0.00)	-0.019 (0.27)	-0.053 (0.77)	-0.101+ (1.72)
Marrieddummy	-0.059 (0.81)	-0.061 (0.73)	0.026 (0.37)	-0.043 (0.59)	0.026 (0.35)	0.016 (0.25)
unemployeddummy	0.011 (0.07)	0.146 (0.81)	-0.211 (1.35)	-0.185 (1.23)	-0.033 (0.21)	-0.169 (1.36)
Unionmemdummy	0.058 (0.71)	0.022 (0.22)	0.019 (0.23)	-0.155+ (1.77)	0.041 (0.47)	-0.040 (0.55)
Protestantism	-0.004 (0.10)	-0.040 (0.75)	-0.055 (1.27)	0.045 (1.00)	-0.066 (1.41)	-0.019 (0.48)
region==2 (Midwest)	0.118 (1.29)	-0.075 (0.66)	0.019 (0.20)	0.112 (1.18)	0.028 (0.30)	0.060 (0.73)
region==3 (South)	0.206* (2.09)	0.022 (0.18)	0.042 (0.43)	0.006 (0.06)	0.070 (0.68)	0.288** (3.23)
region==4 (West)	0.018 (0.18)	-0.256* (2.23)	0.110 (1.07)	0.293** (2.80)	-0.013 (0.13)	0.097 (1.10)
Observations	1905	989	989	986	986	1697
Covered years	all	88,92	88,92	88,92	88,92	76,84,88,92
R-squared	0.25	0.20	0.30	0.28	0.26	

Robust t statistics for OLS and z statistics for OPROB (Ordered Probit) in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%
Year dummies and constant are controlled but not reported here

Table A-2-3 (2): Determinants of whites' attitude on political parties (Source: NES)

	(1)OLS democratic party affect	(2)OLS republican party affect	(3)PROB defectionD	(4)PROB defectionR	(5)PROB presvoteR
Racism	-0.214** (4.86)	0.298** (6.82)	0.256** (3.34)	-0.122+ (1.69)	0.311** (6.90)
Libertarianism	-0.060 (1.43)	-0.047 (1.14)	-0.003 (0.04)	-0.069 (1.10)	0.023 (0.56)
Compassion	0.216** (4.95)	-0.155** (3.60)	-0.192* (2.54)	0.069 (0.98)	-0.240** (5.52)
Feminism	0.513** (11.79)	-0.541** (12.52)	-0.303** (4.11)	0.206** (2.61)	-0.415** (9.17)
incomevalue10k	-0.001 (1.64)	0.002* (2.04)	0.003+ (1.94)	-0.001 (0.55)	0.002** (3.05)
education1==1	0.744** (3.12)	0.166 (0.71)	-0.029 (0.08)	0.018 (0.03)	-0.258 (1.05)
education1==2	0.067 (0.62)	0.033 (0.31)	0.089 (0.48)	0.294+ (1.74)	-0.045 (0.42)
education1==3	-0.203+ (1.82)	0.249* (2.25)	0.233 (1.26)	0.122 (0.74)	0.133 (1.26)
upmobile	-0.208+ (1.94)	0.365** (3.41)	0.519** (2.84)	0.095 (0.59)	0.189+ (1.75)
downmobile	-0.406* (2.13)	0.091 (0.48)	0.057 (0.16)	0.342 (1.26)	0.294 (1.56)
pastecon-omy*incumbentisD	-0.230* (2.25)		0.096 (0.88)		
pastecon-omy*incumbentisR		-0.225** (6.30)		0.199** (3.40)	-0.244** (6.79)
femaledummy	0.191* (2.25)	0.059 (0.70)	0.243+ (1.75)	-0.006 (0.04)	0.115 (1.38)
marrieddummy	-0.147 (1.63)	0.094 (1.05)	-0.003 (0.02)	-0.137 (0.94)	0.109 (1.23)
unemployeddummy	-0.312+ (1.69)	-0.006 (0.03)	-1.033+ (1.85)	0.201 (0.59)	-0.285 (1.29)
unionmemdummy	0.180+ (1.66)	-0.337** (3.14)	-0.300+ (1.80)	-0.118 (0.64)	-0.276** (2.67)
protestantism	-0.109+ (1.94)	0.153** (2.74)	-0.037 (0.39)	-0.227** (2.66)	0.203** (3.78)
respondent age	0.000 (0.01)	-0.015* (2.43)	-0.018+ (1.78)	-0.004 (0.41)	-0.005 (0.76)
pre_crm_cohort	-0.008 (0.04)	0.289+ (1.65)	0.227 (0.83)	-0.025 (0.09)	0.053 (0.32)
post_crm_cohort	-0.067 (0.46)	-0.145 (1.00)	-0.362 (1.56)	-0.005 (0.02)	-0.168 (1.19)
region==2 (Midwest)	-0.055 (0.45)	-0.037 (0.30)	-0.285 (1.43)	0.160 (0.80)	0.074 (0.62)
region==3 (South)	-0.062 (0.49)	-0.011 (0.09)	-0.052 (0.26)	-0.195 (0.89)	0.127 (1.01)
region==4 (West)	0.135 (1.07)	-0.096 (0.76)	-0.096 (0.50)	0.113 (0.55)	-0.031 (0.25)
Observations	1527	1527	537	595	1234
Covered years	80,84,88,92	80,84,88,92	80,84,88,92	80,84,88,92	80,84,88,92
R-squared	0.17	0.22			

Robust t statistics for OLS and z statistics for Probit in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%
Year dummies and constant are controlled but not reported here.

Table A-2-4: Determinants of whites' attitude on various social issues (Source: NES)

	(1)OLS	(2)OLS	(3)OPROB	(4)OPROB	(5)OPROB	(6)OPROB
	7pt govt services/ spending: 1=decrease ... 7=increase	7pt govt health insurance scale 1=pro ... 7=con	food stamps spending - federal budget 1=increase ... 3=decrease	public schools spending - fed budget 1=increase ... 3=decrease	social security spending - federal budget 1=increase ... 3=decrease	environment spending - federal budget 1=increase ... 3=decrease
racism	-0.205** (4.22)	0.226** (4.25)	0.196** (5.33)	0.067+ (1.74)	-0.029 (0.76)	0.157** (4.02)
libertarianism	-0.061 (1.56)	0.056 (1.14)	0.024 (0.71)	0.108** (2.92)	0.030 (0.85)	-0.061+ (1.67)
compassion	0.234** (5.16)	-0.326** (6.22)	-0.375** (10.16)	-0.083* (2.20)	-0.111** (3.01)	-0.056 (1.48)
feminism	0.338** (7.50)	-0.376** (7.28)	-0.236** (6.56)	-0.264** (7.07)	-0.126** (3.41)	-0.279** (7.31)
incomevalue10k	-0.001+ (1.73)	0.005** (5.52)	0.002* (2.30)	0.001 (1.03)	0.002* (2.56)	0.000 (0.59)
Ieducation1	0.484 (1.56)	-0.353 (1.28)	0.214 (1.08)	-0.401+ (1.87)	-0.822** (3.91)	0.333+ (1.65)
education1==2	0.386** (3.85)	-0.204+ (1.69)	0.171+ (1.94)	-0.172+ (1.83)	-0.561** (6.13)	-0.023 (0.24)
education1==3	-0.025 (0.26)	-0.175 (1.41)	0.263** (2.86)	0.039 (0.40)	-0.216* (2.32)	0.036 (0.37)
upmobile	-0.235* (2.37)	0.254* (2.03)	0.158+ (1.84)	0.256** (2.84)	0.020 (0.22)	0.023 (0.25)
downmobile	-0.181 (0.83)	-0.039 (0.17)	0.090 (0.48)	0.492* (2.57)	0.230 (1.19)	0.235 (1.19)
respondent age	-0.007 (1.20)	-0.012+ (1.69)	-0.005 (1.03)	0.017** (3.07)	0.002 (0.34)	0.005 (0.96)
pre_crm_cohort	0.073 (0.44)	0.321 (1.64)	0.109 (0.74)	-0.291+ (1.91)	0.211 (1.40)	-0.345* (2.21)
post_crm_cohort	0.176 (1.24)	-0.114 (0.71)	-0.011 (0.09)	-0.050 (0.39)	0.016 (0.13)	-0.153 (1.19)
femaledummy	0.277** (3.45)	-0.147 (1.53)	-0.102 (1.47)	-0.166* (2.26)	-0.328** (4.57)	0.035 (0.47)
marrieddummy	0.036 (0.42)	0.158 (1.50)	0.137+ (1.88)	-0.066 (0.84)	-0.074 (0.98)	0.134+ (1.69)
unemployeddummy	-0.052 (0.32)	-0.213 (0.95)	-0.544** (3.57)	-0.293+ (1.66)	-0.302+ (1.90)	0.019 (0.12)
unionmemdummy	0.120 (1.23)	-0.265* (2.16)	0.025 (0.28)	-0.140 (1.46)	-0.099 (1.06)	-0.210* (2.15)
protestantism	-0.170** (3.12)	0.172** (2.71)	0.007 (0.16)	0.029 (0.60)	-0.028 (0.59)	0.054 (1.12)
region==2 (Midwest)	-0.110 (1.00)	0.504** (3.58)	0.158 (1.60)	-0.040 (0.38)	0.228* (2.21)	0.228* (2.08)
region==3 (South)	-0.110 (0.90)	0.476** (3.13)	0.330** (3.13)	-0.286* (2.55)	0.120 (1.09)	0.198+ (1.71)
region==4 (West)	0.006 (0.05)	0.207 (1.41)	0.228* (2.16)	-0.261* (2.33)	0.124 (1.14)	0.228* (1.96)
Observations	1156	1541	1193	1225	1222	1216
Covered years	84,88,92	76,84,88,92	84,88,92	84,88,92	84,88,92	84,88,92
R-squared	0.19	0.17				

Robust t statistics for OLS and z statistics for OPROB (Ordered Probit) in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%
Year dummies and constant are controlled but not reported here

Table A-2-4 Continued

	(7)OLS	(8)OLS	(9)OLS	(10)OPROB	(11)PROBIT	(12)PROBIT
	7pt govt guarantted jobs scale 1=pro ... 7=con	should worry less about equality 1=agree ... 5=disagree	poor-welfare-union therm 0-100	does govt waste tax money 1=a lot ... 3=not much	will people take advan-tage of someone 0=no ... 1=yes	are people helpful 0=no ... 1=yes
racism	0.160** (3.67)	-0.310** (7.64)	-0.627** (4.97)	-0.029 (0.89)	0.273** (4.03)	-0.266** (5.81)
libertarianism	0.200** (5.57)	-0.086* (2.29)	-1.499** (13.90)	-0.346** (11.26)	0.179** (2.71)	-0.174** (3.86)
compassion	-0.310** (7.65)	0.200** (5.23)	13.163** (104.77)	0.068* (2.10)	0.015 (0.21)	0.016 (0.35)
feminism	-0.318** (7.72)	0.364** (9.59)	2.560** (17.55)	0.064* (1.99)	-0.087 (1.29)	0.079+ (1.72)
incomevalue10k	0.003** (4.71)	-0.000 (0.08)	-0.004+ (1.91)	-0.001+ (1.94)	-0.001 (0.41)	-0.001 (1.22)
Ieducation1	-0.173 (0.79)	-0.781** (3.19)	1.639** (2.66)	0.243 (1.53)	0.698* (2.45)	-0.573** (2.70)
education1==2	-0.112 (1.26)	-0.441** (4.70)	0.362 (1.28)	-0.109 (1.37)	0.450* (2.32)	-0.329** (2.85)
education1==3	0.126 (1.41)	-0.229* (2.39)	-0.371 (1.32)	-0.216* (2.56)	0.397* (2.00)	-0.178 (1.47)
upmobile	0.205* (2.21)	-0.088 (0.97)	-0.227 (0.79)	0.039 (0.50)	-0.247 (1.40)	-0.010 (0.09)
downmobile	-0.025 (0.15)	0.482* (2.16)	0.105 (0.26)	-0.258 (1.63)	0.234 (0.90)	-0.371* (2.01)
respondent age	0.006 (1.14)	-0.004 (0.82)	-0.009 (0.57)	-0.008+ (1.90)	-0.008 (0.90)	0.006 (1.05)
pre_crm_cohort	-0.186 (1.27)	0.020 (0.13)	0.651 (1.46)	0.121 (0.94)	0.061 (0.22)	-0.019 (0.11)
post_crm_cohort	-0.131 (1.07)	0.155 (1.22)	0.477 (1.34)	0.109 (1.04)	0.091 (0.43)	-0.147 (1.01)
femaledummy	-0.177* (2.43)	-0.020 (0.28)	0.231 (1.09)	0.036 (0.57)	-0.201 (1.54)	0.134 (1.53)
marrieddummy	0.045 (0.57)	-0.075 (0.94)	0.093 (0.41)	0.019 (0.28)	-0.086 (0.58)	0.305** (3.23)
unemployeddummy	-0.491** (2.92)	-0.350* (2.01)	-0.172 (0.41)	-0.075 (0.54)	0.721* (2.51)	-0.432* (2.51)
unionmemdummy	-0.294** (3.09)	0.017 (0.18)	1.841** (7.39)	-0.222** (2.80)	0.076 (0.49)	-0.154 (1.38)
protestantism	0.055 (1.14)	-0.067 (1.38)	-0.067 (0.47)	0.055 (1.33)	-0.020 (0.22)	0.093 (1.57)
region==2 (Mid-west)	0.118 (1.11)	-0.063 (0.62)	0.272 (0.91)	-0.227** (2.60)	0.175 (0.97)	-0.207+ (1.67)
region==3 (South)	-0.083 (0.76)	-0.224* (2.04)	0.068 (0.22)	-0.246** (2.71)	0.274 (1.39)	-0.301* (2.27)
region==4 (West)	-0.040 (0.36)	0.059 (0.52)	0.020 (0.06)	-0.295** (3.15)	0.091 (0.45)	-0.166 (1.23)
Observations	1863	1232	2010	2005	463	1000
Covered years	all	84,88,92	all	all	76	76,92
R-squared	0.16	0.22	0.90			

Robust t statistics for OLS and z statistics for OPROB (Ordered Probit) in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%
Year dummies and constant are controlled but not reported here

Table A-2-4 Continued

	(13)OLS	(14)OLS	(15)OLS	(16)OPROB	(17)OLS
	7pt defense spending scale 1=decrease ... 7=increase	7pt urban unrest scale 1=solve by helping poor ... 7=solve by force	authority of the bible 1=agree ... 4=disagree	schoolprayer 1=agree ... 3=disagree	when should abortion be allowed by law 1=never ... 4=always
racism	0.325** (7.82)	0.447** (7.31)	-0.099** (4.65)	-0.166** (2.93)	-0.081** (2.93)
libertarianism	-0.031 (0.83)	0.100+ (1.78)	0.032 (1.60)	-0.061 (1.10)	0.018 (0.72)
compassion	-0.003 (0.06)	-0.263** (4.11)	-0.052* (2.52)	0.010 (0.18)	-0.108** (3.93)
feminism	-0.223** (5.45)	-0.333** (5.15)	0.075** (3.60)	0.268** (4.44)	0.277** (10.83)
incomevalue10k	0.002* (2.48)	0.002 (1.47)	0.001** (2.71)	0.001 (1.00)	0.002** (3.57)
Ieducation1	0.469+ (1.90)	0.601+ (1.85)	-0.426** (3.19)	-0.448 (1.51)	-0.387* (2.57)
education1==2	0.319** (3.54)	0.271+ (1.85)	-0.268** (5.31)	-0.507** (3.50)	-0.259** (4.03)
education1==3	0.347** (3.96)	0.206 (1.51)	-0.198** (3.97)	-0.227 (1.59)	-0.074 (1.17)
upmobile	0.250** (2.78)	-0.009 (0.06)	0.008 (0.18)	-0.193 (1.41)	-0.140* (2.21)
downmobile	0.080 (0.49)	0.118 (0.47)	0.009 (0.10)	-0.086 (0.41)	-0.046 (0.44)
respondent age	-0.004 (0.75)	-0.006 (0.69)	0.004 (1.31)	0.003 (0.39)	-0.005 (1.25)
pre_crm_cohort	0.148 (1.03)	0.283 (1.15)	-0.018 (0.22)	0.115 (0.49)	0.258* (2.52)
post_crm_cohort	-0.054 (0.43)	-0.329+ (1.74)	-0.027 (0.43)	0.519** (2.84)	0.063 (0.73)
femaledummy	-0.151* (2.06)	-0.552** (4.81)	-0.026 (0.65)	-0.202+ (1.82)	-0.012 (0.24)
marrieddummy	0.113 (1.46)	0.081 (0.65)	-0.059 (1.33)	-0.099 (0.82)	-0.148** (2.78)
unemployeddummy	0.354+ (1.91)	0.151 (0.73)	0.203+ (1.79)	0.141 (0.59)	0.103 (0.96)
unionmemdummy	-0.125 (1.37)	0.143 (1.01)	0.057 (1.24)	0.141 (1.05)	0.080 (1.31)
protestantism	-0.002 (0.05)	0.104 (1.36)	-0.217** (8.59)	-0.165* (2.22)	-0.128** (3.76)
region==2 (Mid-west)	-0.019 (0.18)	0.023 (0.14)	-0.127* (2.21)	0.193 (1.18)	-0.189* (2.55)
region==3 (South)	0.314** (2.93)	0.325+ (1.84)	-0.138* (2.48)	-0.082 (0.52)	-0.079 (1.06)
region==4 (West)	-0.111 (1.06)	0.037 (0.21)	-0.042 (0.70)	0.557** (3.49)	0.063 (0.86)
Observations	1473	916	951	543	1511
Covered years	80,84,88,92	76,92	80,84,88	80,84	80,84,88,92
R-squared	0.26	0.20	0.23		0.20

Robust t statistics for OLS and z statistics for OPROB (Ordered Probit) in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%
Year dummies and constant are controlled but not reported here

Table A-4-1: CPI indices and OASDI tax rate table used in the paper

	CPI	multiplier	OASDI and HI tax rate table				
			OASDI			HI	
			employees	self-employed	taxable maximum	employees	self-employed
1971	40.5	2.565432	0.0460	0.0690	$7,800	0.0060	0.0060
1972	41.8	2.485646	0.0460	0.0690	$9,000	0.0060	0.0060
1975	53.8	1.931227	0.0495	0.0700	$14,100	0.0090	0.0090
1976	56.9	1.826011	0.0495	0.0700	$15,300	0.0090	0.0090
1979	72.6	1.431129	0.0508	0.0705	$22,900	0.0105	0.0105
1980	82.4	1.260922	0.0508	0.0705	$25,900	0.0105	0.0105
1983	99.6	1.043173	0.0540	0.0805	$35,700	0.0130	0.0130
1984	103.9	1	0.0570	0.1140	$37,800	0.0130	0.0260
1987	113.6	0.914613	0.0570	0.1140	$43,800	0.0145	0.0290
1988	118.3	0.878276	0.0606	0.1212	$45,000	0.0145	0.0290
1990	130.7	0.79495	0.0620	0.1240	$51,300	0.0145	0.0290

Source: (1) CPI indices are taken from Table B-60 in the *Economic Report of the President* (2001).

(2) OASDI and HI tax rates are taken from the tax rate table posted in the official web site of the Social Security Administration (URL: http://www.ssa.gov/OACT/COLA).

Table A-4-2: Comparison of percentile incomes (nominal) in the NES and the PSID

Year		16 pctile	33 pctile	67 pctile	95 pctile	97 pctile
1976	W-NES	3999	7999	14999	34999	
	W-PSID (3077)	3500	8500	17800	36530	
	w-PSID (2473)	2.28	4.10	7.09	13.78	37.54
1980	W-NES	6999	11999	24999	49999	
	W-PSID (3268)	5296	11828	25230	53000	
	w-PSID (2662)	3.23	5.60	10.20	19.30	53.63
1984	W-NES	6999	12999	29999	59999	
	W-PSID (3405)	7763	15500	33500	71000	
	w-PSID (2704)	3.39	6.65	12.50	24.50	64.35
1988	W-NES	9999	14999	34999	89999	
	W-PSID (3479)	8386	19000	41146	90768	
	w-PSID (2781)	3.92	7.35	14.70	31.28	96.53
1992	W-NES	9999	19999	39999	89999	
	W-PSID (3518)	8000	19685	45000	99010	
	w-PSID (2790)	3.87	7.83	15.31	33.28	96.53

Note: The statistics in 1992 for the PSID is based on 1990 data (using the 1991 PSID).

Table A-4-3: Estimated parameter values of the model (Summary)

	1976	1980	1984	1988	1992	Source
cpi multiplier (1984==1)	1.826	1.2609	1	0.8783	0.7949	ERP
w_M: male hourly wage (nominal $)	6.18	8.65	10.75	12.79	13.46	PSID
w_F: female hourly wage (nominal $)	2.72	3.95	5.26	6.78	7.77	PSID
L_M: male annual working hours	1951.2	1919.8	1925.7	1973.6	1974.5	PSID
L_F: female annual working hours	850.3	966.0	1101.0	1176.9	1208.1	PSID
Y_M: male labor income (nominal $)	12790.2	17790.8	23049.4	27769.6	30099.3	PSID
Y_F: female labor income (nominal $)	3563.7	5542.5	8160.6	11009.1	12703.3	PSID
O: Other family income (nominal $)	1504.3	2124.0	3557.6	4381.5	4331.9	PSID
W: Pre-fisc family income (nominal $)	14978.0	21217.7	29085.3	36310.3	39320.5	PSID
X: Post-fisc family income (nominal $)	13361.7	11357.3	25574.0	32385.9	35000.9	PSID
Gini: Pre-fisc family income (nominal)	0.4211	0.4206	0.4351	0.4489	0.4627	PSID
Gini: Post-fisc family income (nominal)	0.3273	0.3237	0.3471	0.3633	0.3734	PSID
Theil: Pre-fisc family income (nominal)	0.3097	0.3034	0.3435	0.3654	0.3878	PSID
Theil: Post-fisc family income (nominal)	0.1792	0.1734	0.2155	0.2401	0.2534	PSID
$k_1=w_F/w_M$	0.4397	0.4562	0.4889	0.5301	0.5772	PSID
k_3=O/W	0.1004	0.1001	0.1223	0.1207	0.1238	PSID
uncompensated elasticity (male)	0.03		0.05			HT
uncompensated elasticity (female)	0.99		0.97			HT
t_{obs}: observed tax rate	0.3496	0.3722	0.3204	0.2808	0.2793	PSID
b_{obs}: observed per capita transfer (real $)	6609.9	6555.0	5807.7	5509.8	5295.6	PSID
C: per capita public good (nominal $)	1616.3	2697.8	3511.3	3924.4	4319.6	PSID
tD_{obs}	0.3496	0.3496	0.3496	0.3496	0.3496	PSID
tR_{obs}	0.2793	0.2793	0.2793	0.2793	0.2793	PSID
bD_{obs} (real $)	6609.9	6609.9	6609.9	6609.9	6609.9	PSID
bR_{obs} (real $)	5295.6	5295.6	5295.6	5295.6	5295.6	PSID
RD_{obs}	3.1751	3.1322	3.1683	3.3604	3.3087	NES
RR_{obs}	3.9209	4.9712	4.5281	4.7850	4.9128	NES
white population ratio	0.880	0.879	0.877	0.874	0.870	SAUS
observed D vote share	0.511	0.447	0.408	0.461	0.535	SAUS
self-reported D vote share	0.49	0.43	0.43	0.49	0.57	NES
observed R vote share	0.489	0.553	0.592	0.539	0.465	SAUS

Note: (1) PSID= Panel Study of Income Dynamics; NES=National Election Studies; ERP=Economic Report of the President; SAUS= Statistical Abstracts of the United States; HT= Hausman (1981) and Triest(1990)
(2) Parameter values for 1992 estimated from the PSID are based on the 1991 PSID.

Table A-4-4: Kolmogorov-Smirnov statistic and p-value for evaluating similarities of $g(\rho \mid w)$ across 5 income groups in the NES

1976-1980				
	2	3	4	5
1	0.1175	0.1669	0.1798	0.1498
	0.649	0.115	0.076	0.426
2		0.1186	0.1396	0.1562
		0.235	0.107	0.236
3			0.0633	0.0674
			0.662	0.882
4				0.1005
				0.597
1980-1984				
	2	3	4	5
1	0.1196	0.0864	0.1396	0.1718
	0.747	0.855	0.317	0.439
2		0.0971	0.0793	0.1436
		0.748	0.931	0.672
3			0.0826	0.1475
			0.549	0.489
4				0.1876
				0.186
1984-1988				
	2	3	4	5
1	0.1163	0.1338	0.1042	0.1631
	0.687	0.244	0.554	0.573
2		0.0614	0.1184	0.2158
		0.981	0.396	0.236
3			0.1177	0.2308
			0.061	0.089
4				0.1305
				0.705
1988-1992				
	2	3	4	5
1	0.1882	0.1155	0.0882	0.2012
	0.638	0.226	0.541	0.084
2		0.0993	0.1851	0.2743
		0.343	0.004	0.004
3			0.1258	0.2141
			0.006	0.016
4				0.1389
				0.256

Note: The numbers in the first cell are Kolmogorov-Smirnov statistic whereas the numbers in the second cell are p-values.

Table A-4-5 (1): R vote share weighted probit regression; the variable past-economy is not controlled

	(1)76-80	(2)80-84	(3)84-88	(4)88-92
racism_induced_aidtoblacks	0.193+ (1.94)	0.702** (4.11)	0.770** (6.83)	0.590** (6.23)
libertarianism	0.144* (2.42)	0.113 (1.58)	-0.186** (2.87)	-0.055 (1.02)
compassion	-0.300** (4.88)	-0.266** (3.62)	-0.143* (2.11)	-0.273** (4.52)
feminism	-0.234** (3.77)	-0.222** (2.88)	-0.455** (6.26)	-0.686** (10.35)
logrealwage	0.104 (1.25)	0.228* (2.36)	0.289** (3.43)	0.149* (2.03)
education1=1	-0.796** (2.98)	-0.009 (0.02)	-0.147 (0.42)	-0.512 (1.53)
education1==2	-0.399* (2.53)	0.118 (0.62)	-0.050 (0.30)	-0.314* (2.17)
education1==3	-0.236 (1.47)	0.149 (0.81)	0.289+ (1.78)	0.114 (0.79)
upmobile	0.076 (0.48)	0.349+ (1.86)	0.445** (2.88)	0.328* (2.21)
downmobile	0.132 (0.66)	0.368 (1.35)	-0.784 (1.55)	-0.156 (0.53)
blackdummy	-1.237** (2.67)	0.340 (0.50)	1.016* (2.15)	0.581 (1.34)
femaledummy	-0.054 (0.46)	-0.032 (0.22)	-0.022 (0.17)	-0.075 (0.67)
marrieddummy	0.202 (1.48)	0.092 (0.56)	0.002 (0.01)	0.153 (1.24)
unemployeddummy	0.178 (0.62)	0.046 (0.13)	-0.314 (0.87)	-0.384 (1.36)
unionmemdummy	-0.352** (2.59)	-0.642** (3.81)	-0.588** (3.79)	-0.162 (1.15)
protestantism	0.096 (1.23)	0.128 (1.35)	0.147+ (1.79)	0.223** (2.99)
respondent age	-0.002 (0.21)	-0.028** (2.60)	-0.009 (0.90)	0.006 (0.72)
pre_crm_cohort	0.107 (0.48)	0.498+ (1.66)	0.114 (0.45)	-0.089 (0.39)
post_crm_cohort	0.110 (0.58)	-0.466* (2.00)	-0.313 (1.42)	0.109 (0.54)
region==2 (Midwest)	-0.011 (0.07)	-0.125 (0.58)	0.076 (0.40)	0.125 (0.78)
region==3 (South)	-0.203 (1.19)	0.067 (0.32)	0.099 (0.48)	-0.131 (0.75)
region==4 (West)	0.028 (0.16)	0.113 (0.52)	0.047 (0.24)	-0.210 (1.20)
Observations	623	450	585	785

Absolute values of z statistics in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%
Year dummies and constant are controlled but not reported here

Table A-4-5 (2): R vote share weighted probit regression; the variable past-economy is controlled (Source: NES)

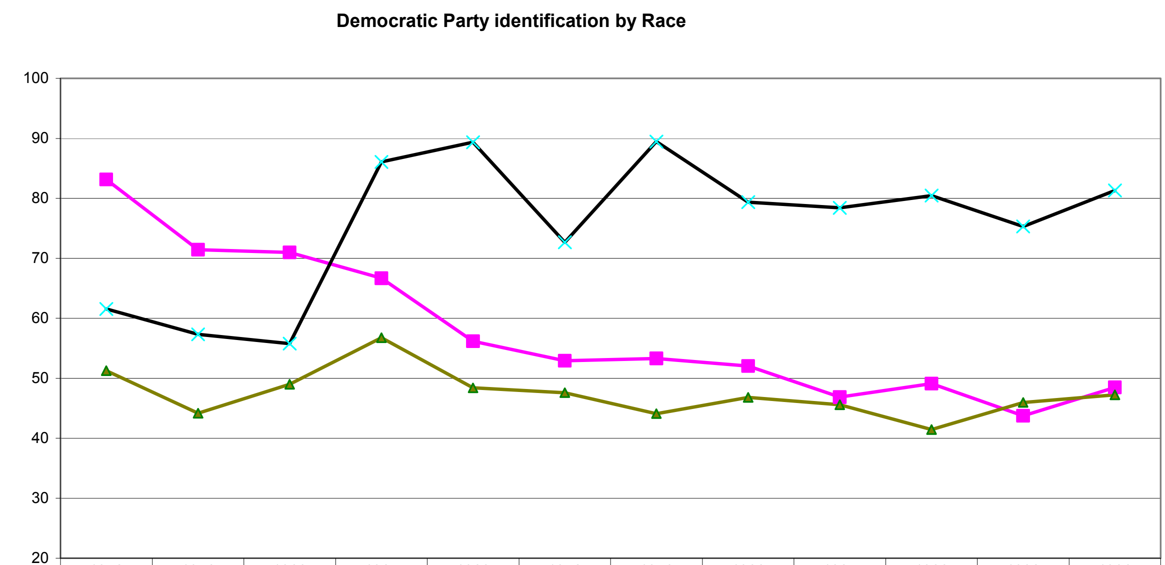
	(1)76-80	(2)80-84	(3)84-88	(4)88-92
racism_induced_aidtoblacks	0.193+ (1.94)	0.695** (3.98)	0.741** (6.41)	0.584** (6.06)
libertarianism	0.144* (2.42)	0.134+ (1.83)	-0.146* (2.19)	-0.032 (0.58)
compassion	-0.300** (4.88)	-0.253** (3.38)	-0.142* (2.03)	-0.270** (4.38)
feminism	-0.234** (3.77)	-0.217** (2.79)	-0.430** (5.71)	-0.658** (9.70)
logrealwage	0.104 (1.25)	0.219* (2.24)	0.283** (3.29)	0.160* (2.14)
education1==1	-0.796** (2.98)	-0.030 (0.08)	-0.184 (0.49)	-0.589+ (1.66)
education1==2	-0.399* (2.53)	0.173 (0.89)	0.033 (0.19)	-0.282+ (1.91)
education1==3	-0.236 (1.47)	0.153 (0.81)	0.329* (1.97)	0.154 (1.04)
upmobile	0.076 (0.48)	0.272 (1.38)	0.266+ (1.65)	0.205 (1.33)
downmobile	0.132 (0.66)	0.398 (1.42)	-0.537 (1.02)	0.005 (0.02)
pasteconomy*incumbentisR		-0.218** (2.98)	-0.237** (4.97)	-0.239** (5.06)
blackdummy	-1.237** (2.67)	0.375 (0.54)	1.005* (2.07)	0.691 (1.56)
femaledummy	-0.054 (0.46)	0.011 (0.08)	0.080 (0.60)	0.003 (0.03)
marrieddummy	0.202 (1.48)	0.106 (0.64)	0.002 (0.01)	0.159 (1.26)
unemployeddummy	0.178 (0.62)	-0.011 (0.03)	-0.354 (0.98)	-0.391 (1.37)
unionmemdummy	-0.352** (2.59)	-0.536** (3.08)	-0.530** (3.31)	-0.188 (1.31)
protestantism	0.096 (1.23)	0.129 (1.34)	0.126 (1.50)	0.214** (2.81)
respondent age	-0.002 (0.21)	-0.023* (2.12)	-0.006 (0.61)	0.006 (0.70)
pre_crm_cohort	0.107 (0.48)	0.384 (1.27)	0.079 (0.30)	-0.093 (0.40)
post_crm_cohort	0.110 (0.58)	-0.422+ (1.79)	-0.267 (1.17)	0.079 (0.38)
region==2 (Midwest)	-0.011 (0.07)	-0.108 (0.49)	0.085 (0.44)	0.127 (0.77)
region==3 (South)	-0.203 (1.19)	0.123 (0.57)	0.168 (0.79)	-0.146 (0.82)
region==4 (West)	0.028 (0.16)	0.128 (0.58)	0.055 (0.27)	-0.209 (1.17)
Observations	623	448	580	781

Absolute value of z statistics in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%
Year dummies and constant are controlled but not reported here.

Table A-5-1: PUNEEPs and the decomposition of racism effect ($\delta_0 = 0.9$)

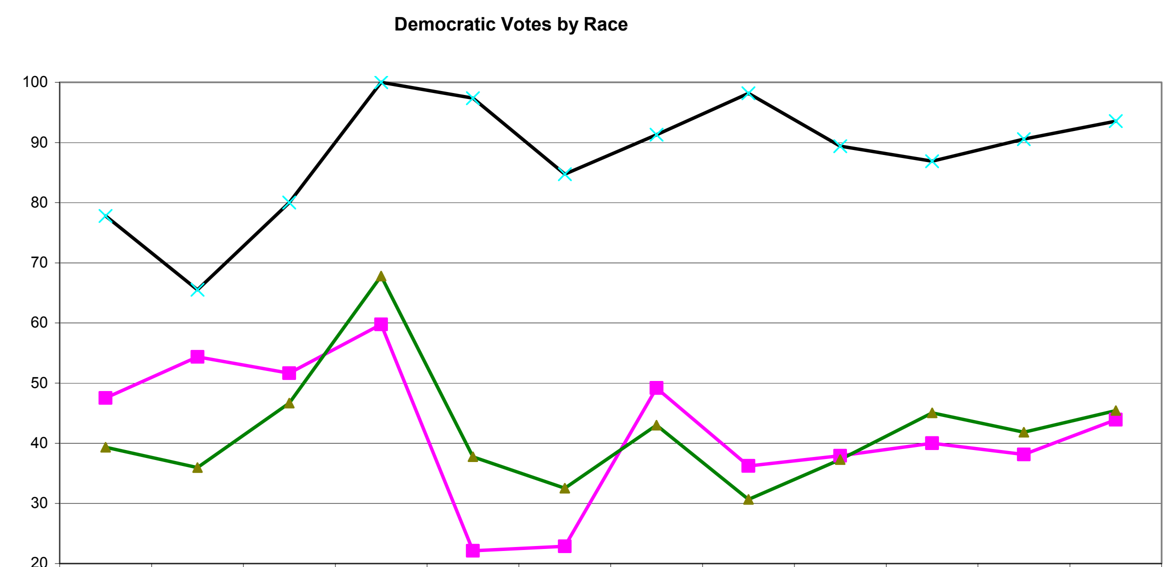
1976-80	Full	r=rbar	r=rbar, ρ=ρmin	Total effect	PB	AS	PB (%)	AS (%)
bpower of D (mode)	0.6042							
bpower of R (mode)	0.2493							
tD	0.3371	0.3619	0.4716	0.1345	0.0248	0.1097	18.44%	81.56%
tR	0.2027	0.3321	0.4157	0.2130	0.1294	0.0836	60.75%	39.25%
RD	3.2162							
RR	4.2044							
Exp tax rate	**0.2872**	**0.3537**	**0.4605**	**0.1733**	0.0665	0.1068	38.37%	61.63%
Vote share	0.4966	0.7251	0.8017	0.3051	0.2285	0.0766	74.89%	25.11%
# of PUNEEP	6	30	15					
1980-84	Full	r=rbar	r=rbar, ρ=ρmin	Total effect	PB	AS	PB (%)	AS (%)
bpower of D (mode)	0.5026							
bpower of R (mode)	0.2742							
tD	0.3985	0.4072	0.4433	0.0448	0.0087	0.0361	19.42%	80.58%
tR	0.2094	0.3638	0.4109	0.2015	0.1544	0.0471	76.63%	23.37%
RD	3.1437							
RR	3.9426							
Exp tax rate	**0.3301**	**0.3920**	**0.4336**	**0.1035**	0.0619	0.0417	59.75%	40.25%
Vote share	0.5204	0.6487	0.7013	0.1809	0.1283	0.0526	70.92%	29.08%
# of PUNEEP	13	43	18					
1984-88	Full	r=rbar	r=rbar, ρ=ρmin	Total effect	PB	AS	PB (%)	AS (%)
bpower of D (mode)	0.4993							
bpower of R (mode)	0.3204							
tD	0.3573	0.3801	0.4731	0.1158	0.0228	0.0930	19.69%	80.31%
tR	0.2309	0.2842	0.3824	0.1515	0.0533	0.0982	35.18%	64.82%
RD	2.9184							
RR	3.8346							
Exp tax rate	**0.3072**	**0.3504**	**0.4550**	**0.1478**	0.0432	0.1046	29.23%	70.77%
Vote share	0.4496	0.6903	0.8002	0.3506	0.2407	0.1099	68.65%	31.35%
# of PUNEEP	18	48	13					
1988-92	Full	r=rbar	r=rbar, ρ=ρmin	Total effect	PB	AS	PB (%)	AS (%)
bpower of D (mode)	0.6393							
bpower of R (mode)	0.1759							
tD	0.3044	0.3237	0.4097	0.1053	0.0193	0.0860	18.33%	81.67%
tR	0.1642	0.2987	0.3999	0.2357	0.1345	0.1012	57.06%	42.94%
RD	2.9781							
RR	4.0335							
Exp tax rate	**0.2642**	**0.3162**	**0.4067**	**0.1425**	0.0520	0.0905	36.52%	63.48%
Vote share	0.5476	0.7012	0.6924	0.1448	0.1536	-0.0088	106.08%	-6.08%
# of PUNEEP	12	30	13					

Figure A-2-1: Voter realignment since 1952 (Source: NES)



	1952	1956	1960	1964	1968	1972	1976	1980	1984	1988	1992	1996
Southern Whites	83.13	71.43	70.97	66.67	56.17	52.9	53.3	52.04	46.83	49.1	43.73	48.48
Non-southern Whites	51.26	44.17	48.99	56.75	48.4	47.6	44.09	46.81	45.58	41.46	45.97	47.24
Blacks	61.54	57.32	55.77	86.08	89.33	72.66	89.47	79.38	78.4	80.47	75.3	81.31

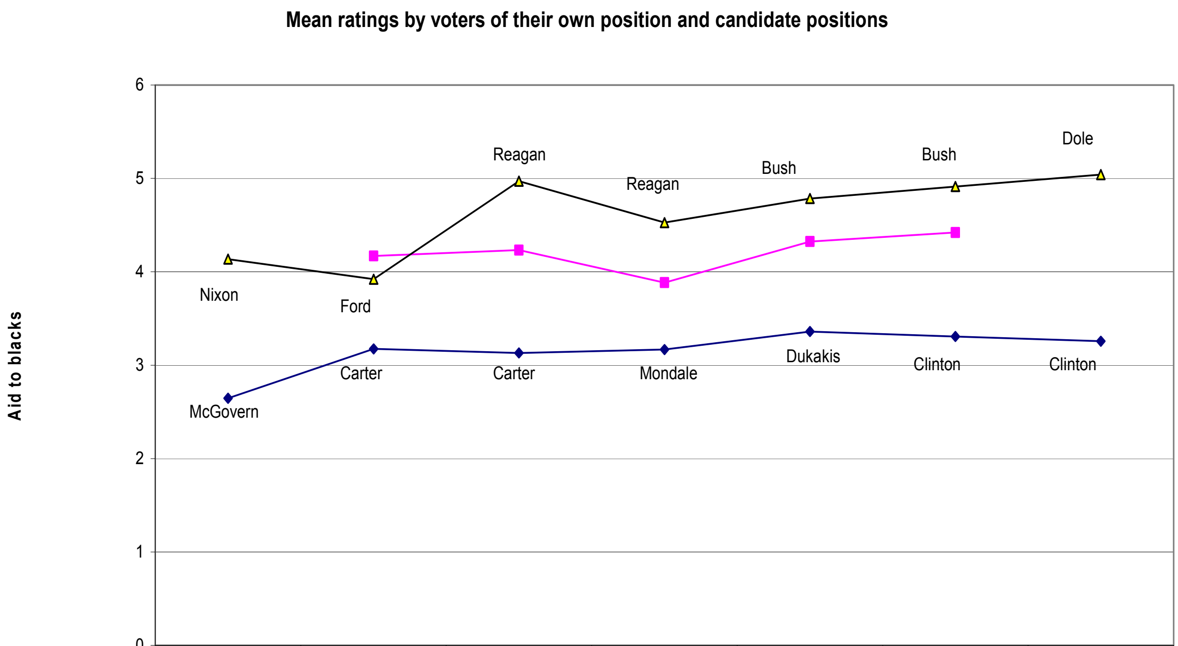
Year



	1952	1956	1960	1964	1968	1972	1976	1980	1984	1988	1992	1996
Southern Whites	47.5	54.37	51.65	59.77	22.11	22.86	49.18	36.21	37.93	40	38.13	43.92
Non-southern Whites	39.33	35.93	46.65	67.8	37.73	32.53	43.01	30.67	37.29	45.06	41.84	45.43
Blacks	77.78	65.52	80	100	97.37	84.72	91.3	98.15	89.39	86.89	90.53	93.55

Year

Figure A-2-2: Mean ratings of position on the racial issue: Voter's racism-induced position and candidate positions (Source: NES)



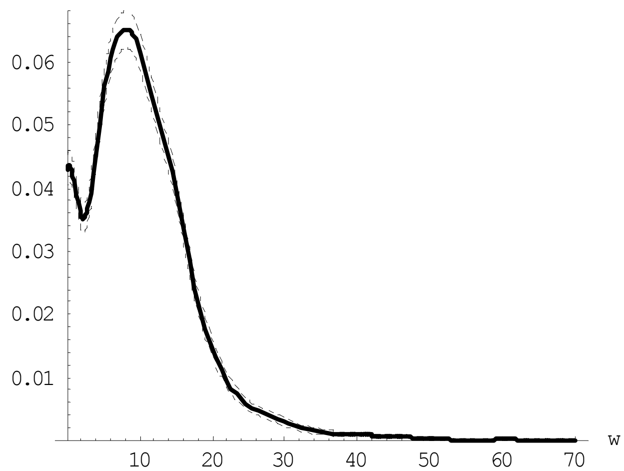
	1972	1976	1980	1984	1988	1992	1996
D candidate	2.646986	3.17507	3.132216	3.168258	3.36043	3.308692	3.256954
Voters		4.170318	4.233192	3.884771	4.323333	4.42179	
R candidate	4.135945	3.920912	4.971193	4.52809	4.784978	4.912797	5.040616

Year

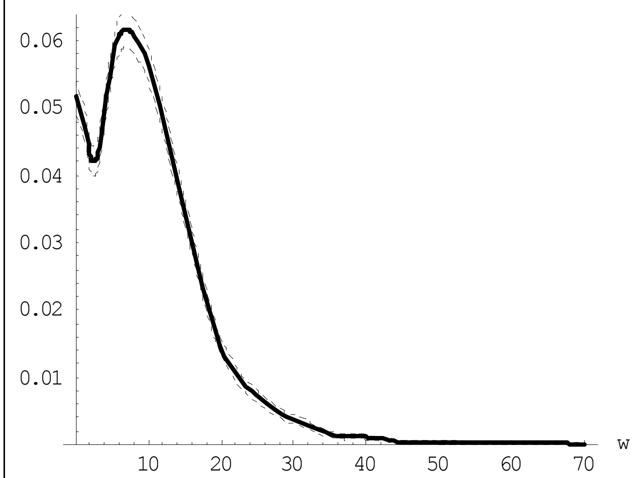
Note: (1) Voters' racial policy position is computed by the mean score of racism-induced aid-to-blacks.
(2) Candidate positions are computed by the mean scores of aid-to-blacks of candidates perceived by voters.

Figure A-4-1: Kernel density estimates of voter types and their 95% asymptotic confidence intervals: 1976-1980 and 1988-92, Whites only

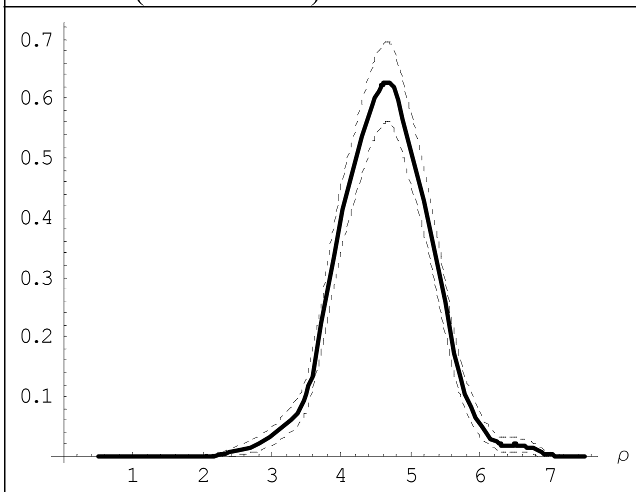
Density of real representative wage rates: 1976-1980 (Source: PSID)



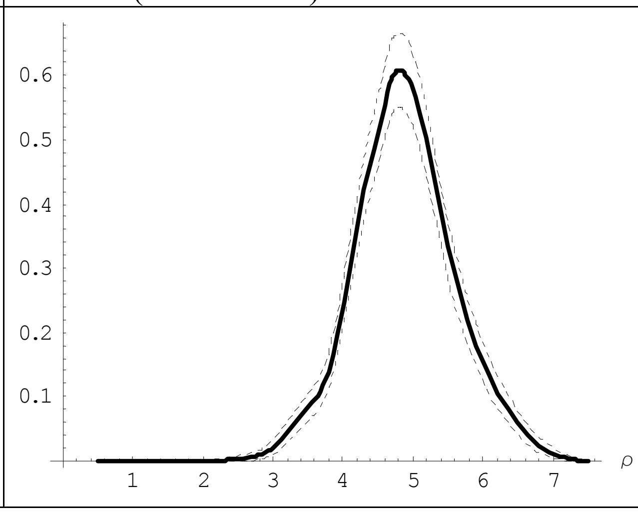
Density of real representative wage rates: 1988-1992 (Source: PSID)



Density of racism-induced aid-to-blacks scores: 1976-80 (Source: NES)



Density of racism-induced aid-to-blacks scores: 1988-92 (Source: NES)



Note: (1) Thick solid lines are density estimates, and thin dotted lines are upper and lower bounds of 95% confidence intervals. (See Appendix 3.)

(2) Kernel=Gaussian, bandwidth= $h = 0.9 * n^{-1/5} Min[Var, \frac{IQR}{1.349}]$, where n is the number of samples, Var is the variance, and IQR is the inter-quartile range.

Figure A-4-2: Racism-induced aid-to-blacks across income levels: Whites only (Source: NES)

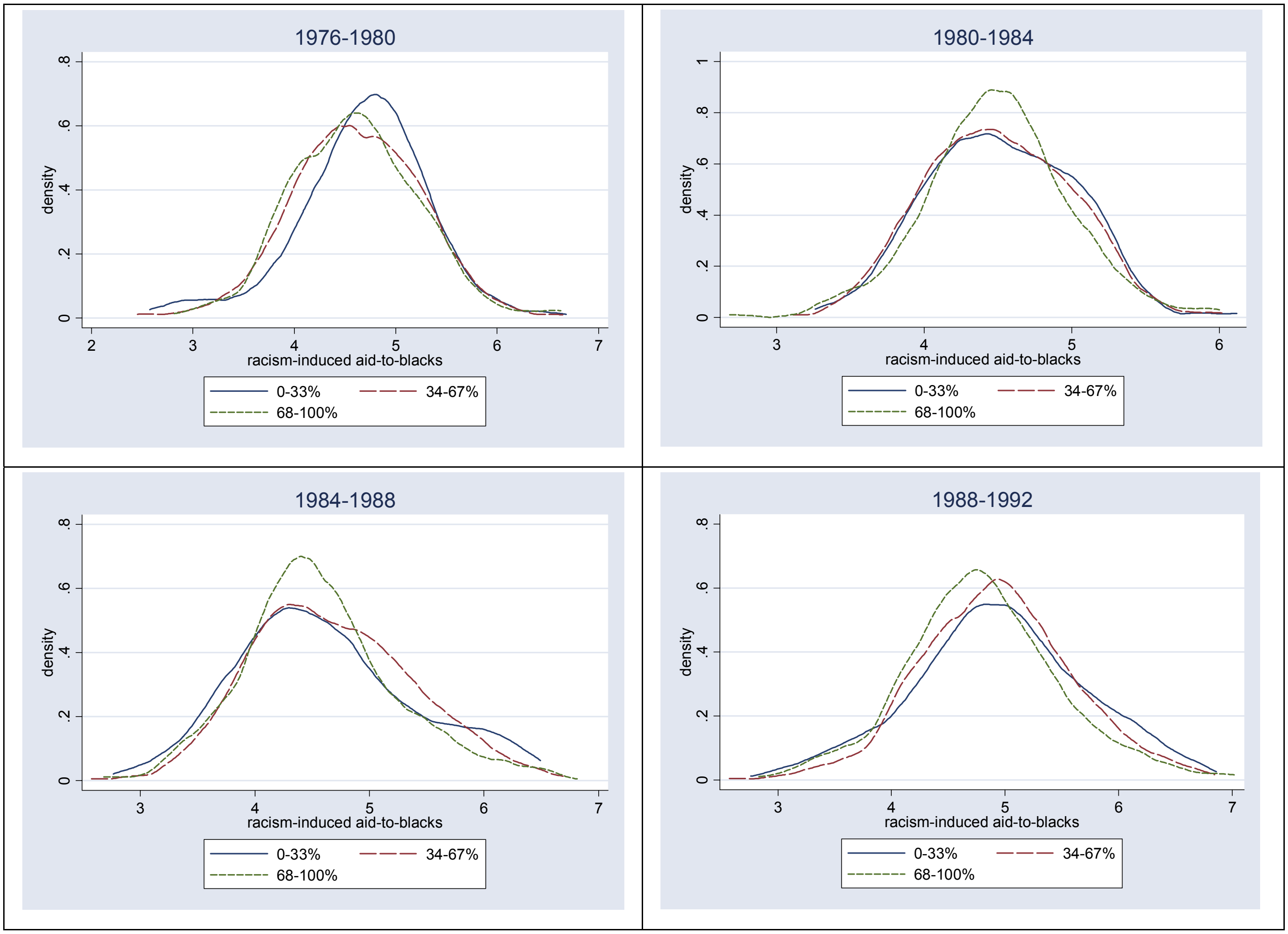
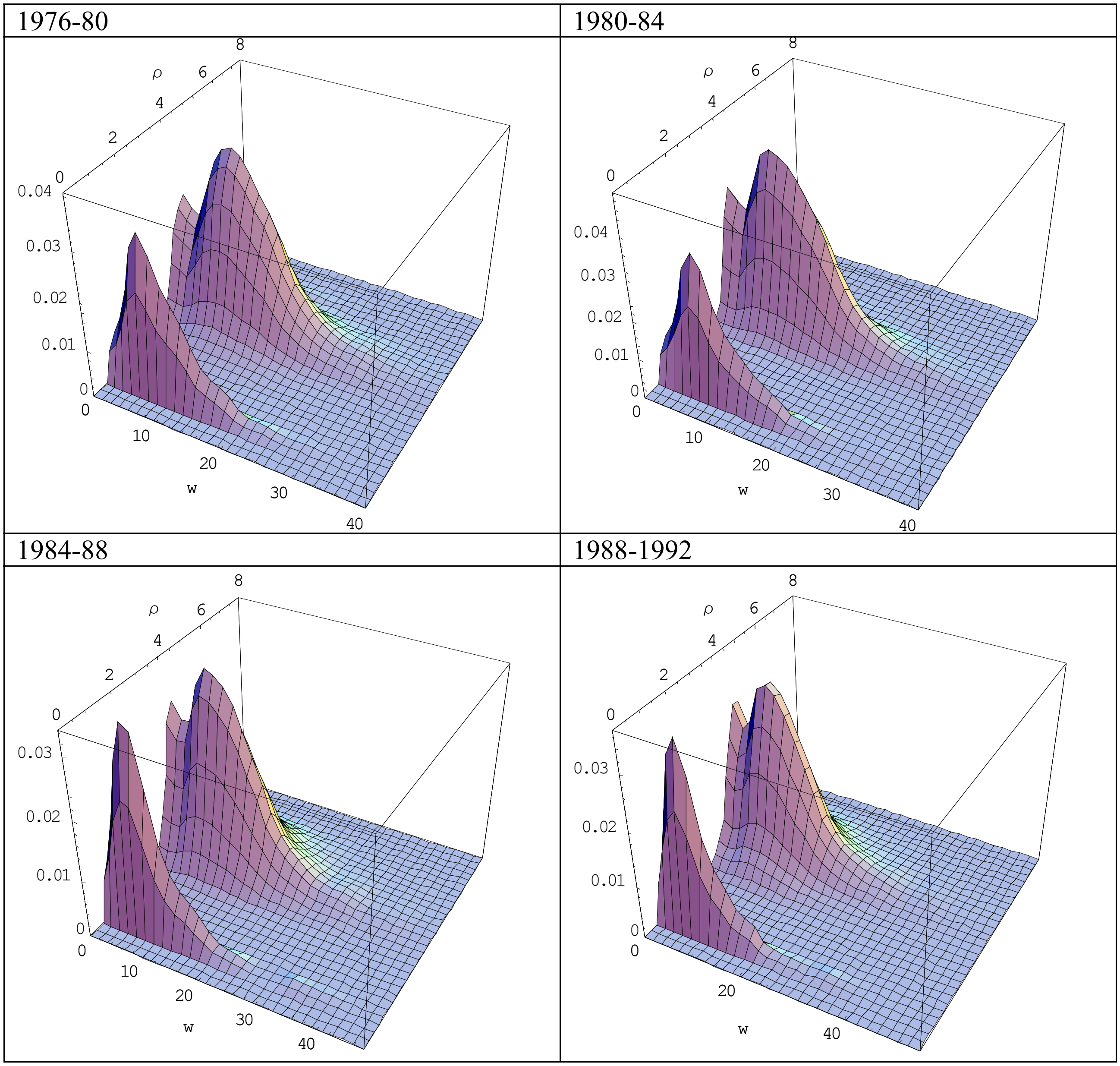


Figure A-4-3: Joint density of voter types (Source: NES and PSID)



Note: We have drawn the joint densities for blacks and whites separately.

Figure A-4-4: Goodness-of-fit of the regression line estimating the marginal tax rate (Source: PSID)

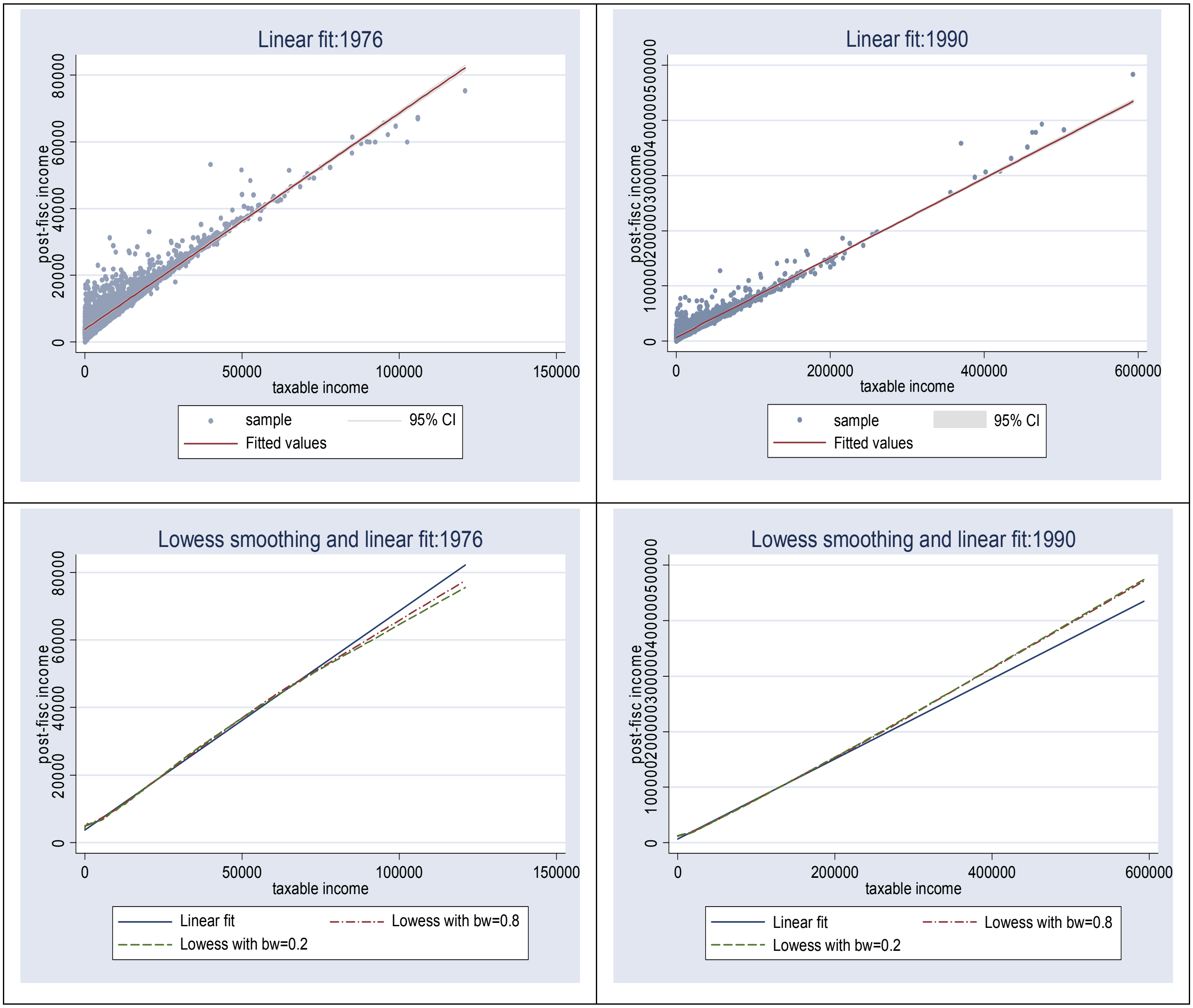
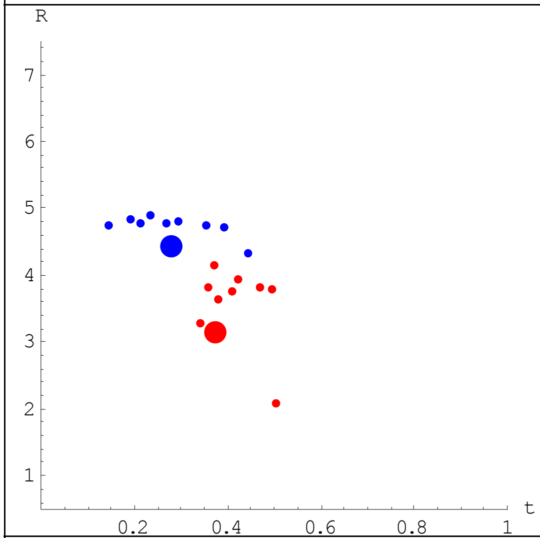
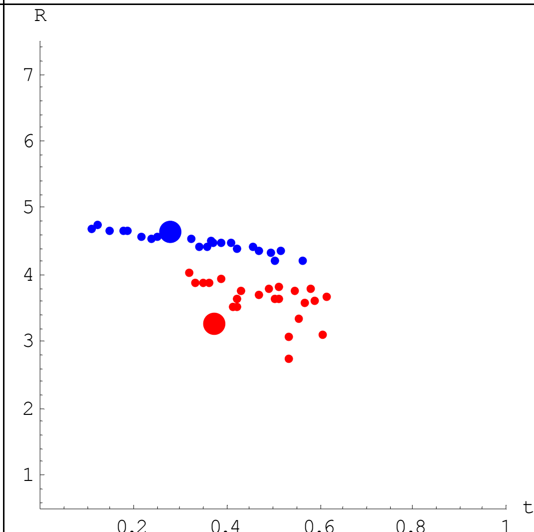
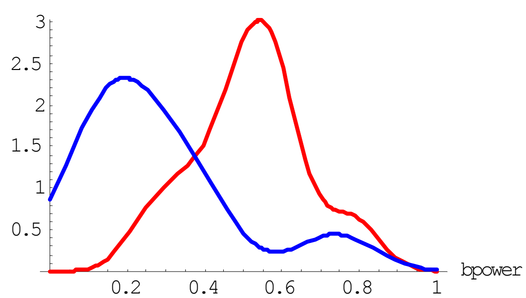
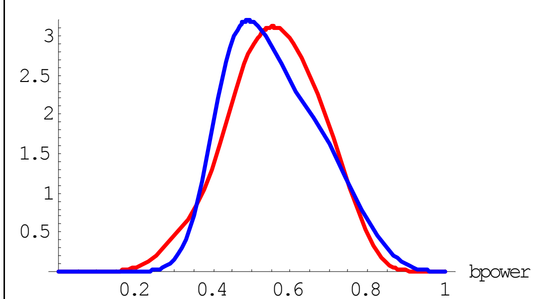


Figure A-5-1: PUNEEPs' in 1984-1988

1976-80	1984-88
	
Likelihood function of bargaining powers	Likelihood function of bargaining powers
	

Appendix 2: Variables from the National Election Studies

Variable Name	Definition and Coding
Abortion law	There has been some discussion about abortion during recent years. Which one of the opinions on this page best agrees with your view? 1. By law, abortion should never be permitted. 2. The law should permit abortion only in case of rape, incest, or when the woman's life is in danger. 3. The law should permit abortion for reasons other than rape, incest, or danger to the woman's life, but only after the need for the abortion has been clearly established. 4. By law, a woman should always be able to obtain an abortion as a matter of personal choice.
Aid to blacks	Some people feel that the government in Washington should make every possible effort to improve the social and economic position of blacks (1970: Negroes) and other minority groups. Others feel that the government should not make any special effort to help minorities because they should help themselves. 1.Government should help minority groups/blacks 2…6 7. Minority groups/blacks should help themselves
Bible authority	Here are four statements about the Bible and I'd like you to tell me which is closest to your own view. 1. The Bible is God's word and all it says is true 2. The Bible was written by men inspired by God but it contains some human errors. 3. The Bible is a good book because it was written by wise men, but God had nothing to do with it. 4. The Bible was written by men who lived so long ago that it is worth very little today.
Black deserve	Over the past few years blacks have gotten less than they deserve. 1. agree strongly; 2. agree somewhat; 3. neither agree nor disagree; 4. disagree somewhat; 5. disagree strongly
Black difficult	Generations of slavery and discrimination have created conditions that make it difficult for blacks to work their way out of the lower class. 1. agree strongly; 2. agree somewhat; 3. neither agree nor disagree; 4. disagree somewhat; 5. disagree strongly
Black effort	It's really a matter of some people not trying hard enough; if blacks would only try harder they could be just as well off as whites. 1. agree strongly; 2. agree somewhat; 3. neither agree nor disagree; 4. disagree somewhat; 5. disagree strongly
Black favor	Irish, Italians, Jewish and many other minorities overcame prejudice and worked their way up. Blacks should to the same without any special favors. 1. agree strongly; 2. agree somewhat; 3. neither agree nor disagree; 4. disagree somewhat; 5. disagree strongly
Civil rights too fast	Some say that the civil rights people have been trying to push too fast. Others feel they haven't pushed fast enough. 1. Too slowly; 2. About right; 3. Too fast
Feeling (affect) thermometer ratings	We would like to get your feelings towards some of these groups (Blacks, Whites, Poor People, Women's Liberation, Labor Union)… We call it a "feeling thermometer" because it measures your feelings towards groups. … If you don't know too much about a group or don't feel particularly warm or cold toward them, then you should place them in the middle, at the 50 degree mark. If you have a warm feeling toward a group or feel favorably toward it, you would give it a score somewhere between 50 degrees and 100 degrees, depending on how warm your feeling is toward the group. On the other hand, if you don't feel very favorably toward some of these groups—if there are some you don't care for too much—then you would place them somewhere between 0 degrees and 50 degrees.
Govt spending	Some people think the government should provide fewer services, even in areas such as health and education, in order to reduce spending. Other people feel that it is important for the government to provide many more services even if it means an increase in spending. Where would you place yourself on this scale, or haven't you thought much about this?

	1. Government should provide many fewer services: reduce spending a lot 2…6 7. Government should provide many more services: increase spending a lot
Govt defense spending	Some people believe that we should spend much less money for defense. Others feel that defense spending should be greatly increased. Where would you place yourself on this scale or haven't you thought much about this? 1. Greatly decrease defense spending 2…6 7. Greatly increase defense spending.
Govt environmental spending	Should federal spending on <item> be increased, decreased or kept about the same? 1. increased; 2. same; 3. decreased or cut out entirely
Govt food stamp spending	Should federal spending on <item> be increased, decreased or kept about the same? 1. increased; 2. same; 3. decreased or cut out entirely
Govt health insurance	There is much concern about the rapid rise in medical and hospital costs. Some feel there should be a government insurance plan which would cover all medical and hospital expenses. Others feel that medical expenses should be paid by individuals, and through private insurance. Where would you place yourself on this scale, or haven't you thought much about this? 1. Government insurance plan 2…6 7. Private insurance plan
Govt public school spending	Should federal spending on <item> be increased, decreased or kept about the same? 1. increased; 2. same; 3. decreased or cut out entirely
Govt social security spending	Should federal spending on <item> be increased, decreased or kept about the same? 1. increased; 2. same; 3. decreased or cut out entirely
Helpful	Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves? 1. Just look out for themselves; 2. Try to be helpful
Job guarantee	Some people feel that the government in Washington should see to it that every person has a job and a good standard of living. Others think the government should just let each person get ahead on his/their own. And, of course, some other people have opinions somewhere in between. Where would you place yourself on this scale, or haven't you thought much about this? 1. Government see to job and good standard of living 2…6 7. Government let each person get ahead on his own
Less equality	The country would be better off if we worried less about how equal people are. 1. agree strongly; 2. agree somewhat; 3. neither agree nor disagree; 4. disagree somewhat; 5. disagree strongly
Party of Presidential vote	Who did you vote for President? 1. Democrat; 2. Republican; 3. Major third party candidate
Political ideology: Liberal-conservative scale	We hear a lot of talk these days about liberals and conservatives. Here is a 7-point scale on which the political views that people might hold are arranged from extremely liberal to extremely conservative. Where would you place yourself on this scale? 1. Extremely liberal; 2. Liberal; 3. Slightly liberal; 4. Moderate 5. Slightly conservative; 6. Conservative; 7. Extremely conservative
Political party affect	This is the number of Democratic (Republican) party 'likes' minus the number of Democratic (Republican) party 'dislikes' (VCF0314-VCF0315). -5 Maximum negative …. +5 Maximum positive
School prayer	Some people think it is all right for the public schools to start each day with a prayer. Others feel that religion does not belong in the public schools but should be taken care of by the family and the church. Have you been interested enough in this to favor one side over other? (IF YES) Which do you think--schools should be allowed to start each day with a prayer or religion does not belong in the schools?

	1. SCHOOLS SHOULD BE ALLOWED TO START WITH PRAYER 3. OTHER; DEPENDS; BOTH (1964-1968); DK; no interest; 5. RELIGION DOES NOT BELONG IN THE SCHOOL
Strong govt	Some people are afraid the government in Washington is getting too powerful for the good of the country and the individual person. Others feel that the government in Washington is not getting too strong. Do you have an opinion on this or not? 1.Opinion: the government has not gotten too strong 2. DK; depends; other; pro-con; no interest; no opinion 3. Opinion: the government is getting too powerful
Take advantage	Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair? 0. Would try to be fair; 1. Would take advantage
Trust govt	People have different ideas about the government in Washington. These ideas don't refer to Democrats or Republicans in particular, but just to government in general. We want to see how you feel about these ideas. How much of the time do you think you can trust the government in Washington to do what is right -- just about always, most of the time or only some of the time? 1. None of the time; 2. Some of the time; 3. Most of the time; 4. Just about always
Urban unrest	There is much discussion about the best way to deal with the problem of urban unrest and rioting. Some say it is more important to use all available force to maintain law and order -- no matter what results. Others say it is more important to correct the problems of poverty and unemployment that give rise to the disturbances. Where would you place yourself on this scale, or haven't you thought much about this? 1. Solve problems of poverty and unemployment 2…6 7. Use all available force
Waste tax money	Do you think that people in the government waste a lot of money we pay in taxes, waste some of it, or don't waste very much of it? 1. a lot; 2. some; 3. not very much
Women equal role	Recently there has been a lot of talk about women's rights. Some people feel that women should have an equal role with men in running business, industry and government. Others feel that a women's place is in the home. Where would you place yourself on this scale or haven't you thought much about this? 1. Women and men should have an equal role 2…6 7. Women's place is in the home

AGE: Age of respondents (VCF 0101)
COHORTS: To see the cohort effect, we construct cohort dummies from AGE. Our baseline cohort is the civil rights movement cohort, i.e., people born in 1935-1947.

> **PRE-CRM-COHORT**: pre-civil rights movement cohort (1 for people born before 1935; 0 otherwise)
> **POST-CRM-COHORT**: post-civil rights movement cohort (1 for people born after 1948; 0 otherwise)

EDUCATION: 1 = Grade school or less (0-8 grades); 2 = High school (12 grades or fewer, incl. non-college training if applicable); 3 = Some College (13 grades or more but no degree); 4 = College or advanced degree
FEMALE: 1=female; 0=male
INCOME: Only income brackets are provided in the NES. We chose a mid-point in each income bracket and converted it to the unit of $10,000.
MARRIED: Respondent's marital status: 1= married; 0= otherwise
MOBILITY: There are two questions asking about how people are getting along financially these days. One question asks whether the respondent is better off than (1), the same as (2), or the worse off than (3) he/she was a year ago (PERSONAL FINANCIAL SITUATION IN PAST YR). The other question asks PERSONAL FINANCIAL SITUATION IN NEXT YR. From these two questions, we constructed two dummy variables measuring upward mobility and downward mobility.

> **UPMOBILE**=1 if the respondent is financially better off now than in last year and his/her personal financial situation is expected to be better next year; 0 otherwise
> **DOWNMOBILE**=1 if the respondent is financially worse off now than in last year and his/her personal financial situation is expected to be worse next year; 0 otherwise

PROTESTANTISM: 2= protestant and attend church more than twice in a month; 1=protestant but attend church not regularly (less than twice in a month); 0=otherwise
PASTECONOMY: Would you say that over the past year the nation's economy has gotten better, stayed about the same or gotten worse? 1. Better; 3. Stayed same; 5. Worse
REGION: 1. Northeast (CT, ME, MA, NH, NJ, NY, PA, RI, VT); 2. North Central (IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI); 3. South (AL, AR, DE, D.C., FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV); 4. West (AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY)
UNEMPLOYED: Unemployment dummy constructed from VCF0116 (Respondent's WORK STATUS)
1= temporarily laid off or unemployed; 2= otherwise
UNIONMEM: Union membership dummy constructed from VCF0127 (HOUSEHOLD UNION MEMBERSHIP)
1= someone in household belongs to a labor union; 2 = no one in household belongs to a labor union
URBANISM: This variable represents respondent's sampling address. 1=central cities 2=suburban area; 3=rural areas and small towns

Appendix 3: Kernel density estimator and asymptotic statistics

(1) The kernel density estimate for variable *x* with a sample $\{x_i\}$, which is independently and identically drawn from an unknown density *f*, is given by

$$\hat{f}(x) = \frac{1}{N_x}\sum_{i=1}^{N_x}\left(\frac{1}{h_x}K(\frac{x-x_i}{h_x})\right),$$

where x_i is the ith sample point for variable *x*, N_x is the number of observations for variable *x*, h_x is a bandwidth (or a smoothing parameter), and *K(.)* is a kernel function.

The kernel estimator clearly depends on the choice of a kernel and a bandwidth, but it is well known that the choice of a kernel is a minor issue. Indeed the difference between the values of the Mean Integrated Square Error attained by most kernels and the optimal kernel, often called the Bartlett-Epanechnikov kernel, is small (Silverman, 1986: p. 43). We chose the Gaussian kernel.

In contrast, the selection of a bandwidth is crucial. Several methods for estimating an optimal bandwidth have been suggested in the literature (e.g., cross-validation methods, plug-in methods), but these methods are computationally expensive and the rate of convergence is extremely slow, being of the order of $N_x^{-1/10}$. Also when the criterion function used in estimating the optimal bandwidth has several local minima, quite different values of estimated bandwidths may be derived for data sets coming from the same distribution. Therefore, in setting the optimal bandwidth, we follow Silverman's rule of thumb:

$$h_x^{opt} = 0.9 * N_x^{-1/5} Min[Var_x, \frac{IQR_x}{1.349}],$$

where *N* is the number of samples, *Var* is the variance, and *IQR* is the inter-quartile range.

One minor issue is that the above estimates are based on the assumption that the support of the density is the entire real line. This assumption may generate a somewhat inaccurate estimate if the support is bounded. We find that the estimate of the wage distribution is somewhat inaccurate around the origin because there are many non-working individuals. So we adjust the density estimate by using the reflection method described in Silverman (1986: p.30). More precisely, we estimate the wage density by the formula:

$$\hat{f}(x) = \frac{1}{N_x}\sum_{i=1}^{N_x}\left(\frac{1}{h_x}K(\frac{x-x_i}{h_x}) + \frac{1}{h_x}K(\frac{x+x_i}{h_x})\right),$$

(2) The bias of the kernel estimator is:

$$Bias\hat{f} \equiv E\hat{f} - f = \int K(\psi)[f(h_x\psi + x) - f(x)]d\psi \approx \frac{h_x^2}{2}\mu_2 f''(x),$$

where $\psi = \dfrac{x - x_i}{h}$, and its variance is given by

$$Var\hat{f} = \frac{1}{N_x h_x}\int K^2(\psi)f(h_x\psi + x)d\psi - \frac{1}{N_x}[\int K(\psi)f(h_x\psi + x)d\psi]^2 \approx \frac{1}{N_x h_x} f(x)\int K^2(\psi)d\psi .$$

(See Pagan and Ullah (1998, p. 22).)

It is well known that under some regularity conditions, the kernel estimator is asymptotically unbiased ($\lim E\hat{f} = f$), consistent weakly ($\hat{f} \xrightarrow{p} f$) and strongly ($\hat{f} \xrightarrow{a.s} f$), and asymptotically normal ($\sqrt{N_x h_x}(\hat{f} - f) \xrightarrow{d} Normal(0, f\int K^2(\psi)d\psi)$). Hence a pointwise 95% confidence interval for the density estimate is:

$$\hat{f}(x) \pm 1.96\frac{1}{\sqrt{N_x h_x}}[f(x)\int K^2(\psi)d\psi]^{1/2} .$$

By replacing f with its consistent estimator (i.e, $\hat{f}$) and computing $\int K^2(\psi)d\psi$ (which is approximately 0.2821 if the kernel is Gaussian), we obtain the asymptotic confidence interval for $\hat{f}$.

(3) The Kolmogorov-Smirnov statistic is intended to evaluate the goodness of fit of two empirical distribution functions in terms of the sup norm. Suppose $\hat{F}_{N_1}(x)$ and $\hat{F}_{N_2}(x)$ are the empirical distribution functions of two (independent) samples $(X_1,..., X_{N_1})$ and $(Y_1,..., Y_{N_2})$. The KS statistic is $KS = \sup\left|F_{N_1}(x) - F_{N_2}(x)\right|$. Smirnov derives the limiting distribution of $\sqrt{\frac{N_1 N_2}{N_1+N_2}}KS$: $\lim_{N_1, N_2 \to \infty} \Pr(\sqrt{\frac{N_1 N_2}{N_1+N_2}}KS \leq z) = 1 - 2\sum_{i=1}^{\infty}(-1)^{i-1}\exp(-2i^2 z^2)$. The p-value for the KS statistic is obtained by evaluating the limiting distribution of the KS statistic. Exact p-values can be computed, but we use the first 5 terms to form the approximate p-values.

(4) The bivariate density estimate $\hat{h}(\mathbf{z})$ for a sample $\{\mathbf{z_i}\} = \{(x_i, y_i)\}$ is given by the formula

$$\begin{aligned}\hat{h}(x, y) &= \frac{1}{Nh^2}\sum_{i=1}^{N}\left(\frac{1}{h}K(\frac{x - x_i}{h}, \frac{y - y_i}{h})\right) \\ &= \frac{1}{Nh^2\sqrt{\mathbf{V}}}\sum_{i=1}^{N}\left(\widetilde{K}(\frac{(\mathbf{z} - \mathbf{z}_i)'\mathbf{V}^{-1}(\mathbf{z} - \mathbf{z}_i)}{h^2})\right),\end{aligned}$$

where N is the number of observation for $\{\mathbf{z_i}\}$, $\mathbf{V}$ is the sample covariance matrix of the data, $K(.,.)$ is the standard bivariate normal distribution and $\widetilde{K}(.)$ is the function such that $\widetilde{K}(\mathbf{z}'\mathbf{z}) = K(\mathbf{z})$; if $K(.,.)$ is the standard bivariate normal, $\widetilde{K}(u)$ is equal to $\dfrac{\exp(-\frac{1}{2}u)}{2\pi}$ (Silverman, 1986: p. 78).

The independence assumption requires testing $H_0 : h(x,y) = f(x)g(y)$. Ahmad and Li show (Pagan and Ullah, 1999: p.71) that under H_0 and as $h \to 0$ and $Nh^2 \to \infty$,

$$T_1 = \frac{Nh\bar{I}_1}{\hat{\sigma}_3} \xrightarrow{d} Normal(0,1) \text{, where}$$

$$\hat{\sigma}_3 = \frac{1}{N^2}\sum_{i=1}^{N}\hat{f}(x_i)\sum_{i=1}^{N}\hat{g}(y_i)\int[K_x(\psi)]^2 d\psi \int[K_y(\psi)]^2 d\psi ,$$

and

$$\bar{I}_1 = \frac{1}{(Nh)^2}\sum_{i\neq j}\sum_{j}K_x(\frac{x_i - x_j}{h})K_y(\frac{y_i - y_j}{h}) + \frac{1}{(N^2h)^2}\sum_{i\neq j}\sum_{j}K_x(\frac{x_i - x_j}{h})\sum_{i\neq j}\sum_{j}K_y(\frac{y_i - y_j}{h})$$
$$-2\frac{1}{N^3h^2}\sum_{i\neq j}\sum_{j\neq k}\sum_{k}K_x(\frac{x_i - x_j}{h})K_y(\frac{y_j - y_k}{h}),$$

where $K_x(.)$ is the kernel for $\hat{f}(.)$ and $K_y(.)$ is the kernel for $\hat{g}(.)$.

(5) A local regression scatter plot smoother, known as lowess, fits a line to a scatter plot by estimating the relationship between y and x at a number of target points over the range of the observed x values. It first identifies the q nearest neighbors of a target point x_0, denoted by $N(x_0)$, and then calculates weights w_i for each point in $N(x_0)$ using a weight function $W(\frac{|x_0 - x_i|}{\max_{N(x_0)}|x_0 - x_i|})$.

Then it regresses y on $(1,x)$ for local linear fitting, using weighted least squares. Repeating this procedure for each target point traces out a function, the smoothed fit of y against x. As in the case of density estimation, the calculated smoother clearly depends on the choice of a weight function and a bandwidth. The choice of a weight function is a minor issue; we chose the tricube weight function: $W(z) = (1 - z^3)^3 \mathbf{I}_{[0,1]}(z)$. Bandwidths could be estimated using cross-validation or plug-in methods as in the case of density estimates.

Appendix 4: Procedure of estimation and numerical computation

I. Estimation of model parameters

A. Distribution of voter types

We explain the estimation of the real wage rate. The PSID sample consists of two independent samples: a cross-sectional national sample drawn by the Survey Research Center (SRC) and a sample of low-income families drawn from the Survey of Economic Opportunity (SEO); the latter sample is confined to Standard Metropolitan Statistical Areas (SMSA's) in the north and non-SMSA's in the southern region. To avoid the risk of over-sampling poor families, we drop the SEO sample, and base our calculation only on the SRC sample with positive taxable incomes.[10] The PSID dataset in year *s* pertains to calendar year *s*-1; the labor market data for year *s* below were constructed from the PSID dataset in year *s*+1. The last election year in the current paper is 1992. But the last year for which we can calculate income taxes, post-fisc income and pre-fisc income from PSID is 1990 (using the 1991 PSID). Hence for 1992, we had to use the labor market information in 1990 contained in PSID 1991.[11]

Our real wage rate is the nominal wage rate computed from the PSID, adjusted by the CPI index (normalized to the 1984 level). (For the Consumer Price Index, see Table A-4-1 in Appendix 1.)

B. Estimation of observed tax rates and transfer payments (t_{obs} and b_{obs})

To calculate the observed marginal tax rates and transfer payments consistent with the affine tax scheme of our model, we regress post-fisc family income on pre-fisc family income with a constant term.

[10] Positive taxable income at the family level does not necessarily mean that the wage rate earned by the male in the family is positive.

[11] Is the distribution of incomes among respondents in the NES close to the distribution of incomes among respondents in the PSID? We compared percentile incomes in the NES with the corresponding percentile incomes in the PSID; we find that they are very similar. (See Table A-4-2 in Appendix 1.)

To run the regressions, we need to estimate post-fisc incomes. To calculate post-fisc family income, we first subtracted federal income taxes, social security taxes (paid by employees) and Medicare taxes (paid by employees) from the taxable (i.e., pre-fisc) family income, and then added government transfer payments received by each family.

Federal income taxes paid by each household are already provided in PSID, but the other two taxes are not. We calculated them using the social security and Medicare tax rate table. (See Table A-4-1 in Appendix 1.) Since an individual's retirement benefits are linked to past social security tax payments, treating all social security taxes as pure taxes is problematic. We treat the employee contribution as a pure tax, and ignored the employer contribution as in Triest (1990).

For government transfers, we included the following: AFDC, SSI (Supplemental Security Income), other welfare, VAP (Veterans Administrations Pension), other retirement benefit, unemployment benefit, worker's compensation, child benefit, government subsidy for heating costs, and monetary value of food stamps.[12]

C. Parameter values of the sub-utility function

In Table A-4-3 in Appendix 1, we also report the wage rates of males and females, labor incomes and other incomes. They are used in calculating the ratios of female wage rates to male wage rates (k_1) and of non-wage incomes to total pre-fisc incomes (k_3).

Table A-4-3 also reports the estimated value of C, which is equal to the difference between the mean of pre-fisc and post-fisc incomes.[13]

It remains to estimate the parameter vector that characterizes the labor supply functions, $(\beta_M, \beta_F, \lambda_M, \lambda_F)$. Hausman (1981) and Triest (1990) estimated uncompensated wage elasticities of labor supply for both males and females for 1976 (Hausman) and 1984 (Triest) using non-reduced form labor supply functions, which correspond to equations (13) and (14) in our model,

[12] There may be some bias in our estimated post-fisc incomes. First, taxes reported in the PSID are calculated after taking out exemptions but not deductions. Also the post-fisc income does not include tax credits (such as child credit, or EIC). These two facts will generate a downward bias in the estimated post-fisc incomes.
Second, we are unable to include the housing rent subsidy, and the monetary value of public education or public health (such as Medicaid), because there is no information about their value. This will also generate downward bias in the estimated transfer amounts and hence post-fisc incomes.

[13] If tax revenues are completely redistributed, then C must equal zero, because in that case, the sum of pre-fisc incomes across families is equal to the sum of post-fisc incomes.

and using the same methodology and the same dataset, PSID. (These elasticities are reported in Table A-4-3. [14])

Their estimates are based upon the assumption that husbands do not take into account the labor income of wives (i.e., $Y_F = w_F L_F$ in our model) in making their labor supply decision, while wives do take into account the labor income of husbands. In the context of our model, the elasticities computed from non-reduced form equations (13) and (14) are:

$$\xi_M = \frac{\partial \log L_M}{\partial \log w_M} = \frac{\frac{\beta_M}{1+\beta_M}\left(\frac{b}{1-t} + Y_F + O\right)\frac{1}{w_M}}{L_M}, \tag{36}$$

$$\xi_F = \frac{\partial \log L_F}{\partial \log w_F} = \frac{\frac{\beta_F}{1+\beta_F}\left(\frac{b}{1-t} + Y_M + O\right)\frac{1}{w_F}}{L_F}, \tag{37}$$

where

$$L_M = \frac{\lambda_M}{1+\beta_M} - \frac{\beta_M}{1+\beta_M}\left(\frac{b}{1-t} + Y_F + O\right)\frac{1}{w_M}, \tag{38}$$

$$L_F = \frac{\lambda_F}{1+\beta_F} - \frac{\beta_F}{1+\beta_F}\left(\frac{b}{1-t} + Y_M + O\right)\frac{1}{w_F}. \tag{39}$$

We use the Triest estimates for all years since 1984 and the Hausman estimates for 1976 and 1980 (assuming that the elasticity of labor supply does not change much over time). We estimate the four parameters $(\beta_M, \beta_F, \lambda_M, \lambda_F)$ by solving the above four equations simultaneously while setting $Y_F = 0$ and substituting yearly estimated values of t and b and the mean values of working hours, O, Y_M, w_M and w_F into the equations.

D. Observed party membership

Our model identifies those who vote for a party with its membership, in equilibrium. It is useful to look at how party membership is distributed over voter types. We calculate the party membership probabilistically from the NES by looking at the fraction of citizens voting for party J in each of the 25 discrete voter types. The observed party membership for party D calculated in that way will be compared with the equilibrium party membership later (see Figure 5-2, for instance).

[14] They estimate elasticities by several methods; we chose those elasticities recommended in Blundell and MaCurdy (1991).

E. Remaining parameters

There remain three un-estimated parameters in the utility function related to the equality term and the salience of racial issue: $(\delta_0, \delta_2, \gamma)$.

We apply equation (35) to estimate some of them. We ran probit regressions to estimate the size of $\delta_2(E(t^D_{obs}) - E(t^R_{obs})) - \gamma(r^D_{obs} - r^R_{obs})$, which appears as the size of the coefficient on the racism-induced aid-to-blacks. The results are reported in Table A-4-5.

Perception about the performance of the economy in the past is an important explanatory variable for vote shares of all years. Dropping this variable will cause some bias for the estimated coefficient. Unfortunately, information on this variable is not available for 1976. We ran two regressions, one with the past-economy variable as a regressor (except 1976-1980) and the other without it. The coefficients are slightly different. We use the estimated coefficients from the regressions with the past-economy variable included, except for 1976-80.[15]

II. Numerical computation

For the full model, we use equations (28a & b)-(29a & b), which form a system of 4 equations in 6 unknowns (the four policy variables and the two Lagrangean multipliers). Consequently, we can expect to find a 2-manifold of solutions in the full model if there are any solutions. We solve the four equations for r^D, r^R, x^D, and x^R for the values of t^D and t^R, which was randomly chosen from fine grids of the relevant domain, while checking $x^D \geq 0$ and $x^R \geq 0$. For the two counterfactual models, we solve the two equations (28a) and (29a) for x^D and x^R, while checking whether $x^D \geq 0$ and $x^R \geq 0$ hold.

In the calibrations, we use the parameters and density functions estimated in section 4. Because there is one degree of freedom, we varied δ_0 and determined δ_2 and γ by the two estimated equations:

$$\delta_2(E(t^D_{obs}) - E(t^R_{obs})) - \gamma(r^D_{obs} - r^R_{obs}) = \text{regression coefficient on } \rho, \tag{40}$$

and

$$\varphi(t^D_{obs}, t^R_{obs}, r^D_{obs}, r^D_{obs}; \delta_0, \delta_2, \gamma) = \varphi_{obs}. \tag{41}$$

[15] Thus there may be some bias in our estimated coefficients in this period.

We found that the *admissible* range of δ_0 is not wide. If δ_0 is too small, γ or δ_2 become negative. When δ_0 is too large, equilibria fail to exist. (Recall that we have to find equilibria for all three models.) The admissible range of δ_0 that allows us to obtain the equilibrium for *all* years and for all *three* models is approximately between 0.85 and 1.1. We have no way of estimating δ_0. We carry out numerical computations with two parameter values: $\delta_0 = 0.9$ and $\delta_0 = 1$. We discuss the results for $\delta_0 = 1$. The results for $\delta_0 = 0.9$ are reported in Appendix 1 (Table A-5-1).

As predicted by our model, we find many PUNEEPs. PUNEEPS are graphically illustrated in Figure A-5-1 for selective years.

PUNEEPs are somewhat scattered. But they are not uniformly scattered. To see whether they appear *equally likely* and what the likelihood of PUNEEPs would be if the same computation were carried out many times, we examined the likelihood functions of PUNEEPs for both parties. In particular, the likelihood function of the bargaining power of opportunist faction is highly concentrated for both parties. The mean values of the relative bargaining power of the Opportunists are approximately 0.5545 for party D and 0.4909 for party R.

Because there are many PUNEEPs, we need summary statistics. Because PUNEEPs are concentrated, we take a weighted average, where weights are computed according to the following rule:

(1) For each year, we first compute the likelihood function of the bargaining power in each party and identify its mode (i.e., the value of the bargaining power that is most likely to appear).

(2) For the i^{th} equilibrium, we then compute its weight for each party, ω_i^J, as follows: $\omega_i^J = W\left(\dfrac{\left|\alpha_i^J - \alpha_{\text{mod}}^J\right|}{\max_i \left|\alpha_i^J - \alpha_{\text{mod}}^J\right|}\right)$, where $W(.)$ is a weight function and α_i^J is the bargaining power of the Opportunist in party J at the i^{th} equilibrium. We chose the popular tri-cube weight function $W(z) \equiv (1 - z^3)^3 \mathbf{I}_{[0,1]}(z)$.[16] Thus if α_i^J is identical to the mode, the platform of party J in the i^{th} equilibrium gets the weight of 1; it is penalized as α_i^J moves away from the mode.

(3) Finally we apply the computed weights to calculate the weighted average of each party's platform vector.

[16] $\mathbf{I}_{[0,1]}(z)$ is an indicator function which takes the value of 1 if z is in the interval [0,1] and 0 otherwise.