Radio's Impact on Public Spending

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Abstract

Mass media carry political information to the voter. This makes voters using mass media more likely to respond to campaign promises and to hold politicians accountable for policies that hurt them. As a consequence, politicians should target mass media users. These ideas are developed in a voting model which also forms the basis for empirical investigation.

To isolate the effects of mass media on government spending empirically, this paper looks at a period of rapid change in the mass media market. It analyzes a major New Deal relief program implemented in the middle of the expansion period of the radio.

The main empirical finding is that counties with many radio listeners received more relief funds. More funds were allocated to poor counties with high unemployment, but controlling for these and other variables, the effects of the radio are large and highly significant. A one standard-deviation increase in the share of households with radios raises spending by 9 percent. If other government funds were distributed in a similar fashion, then the introduction of the radio may have led to major reallocations in the government budget.

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Knowledge is power.[1]

1. Introduction and summary

The public believes that mass media play an important role in politics. Politicians act and behave on the basis of the same assumption. Surprisingly, the idea of an important role for the media has not found strong support in academic research. The classic study in this field, Lazarsfeld, Berelson and Gaudet (1944), and sequels that followed,[2] found that mass media had only minimal effects on voter's choices. More recent studies have extended the search beyond mass media's effects on voting to effects on public opinion and employed new research designs and techniques.[3] While the results from these studies are more encouraging they are far from conclusive.

One reason for the apparent tension between popular beliefs and academic research might be that mass media's influence is more visible in other dimensions of politics than voting and public opinion. To pin-point areas where media effects would be the largest, Strömberg (1999) develops a formal model of the complex interactions between voters, politicians and mass media. He finds that mass media's main impact is likely to be on *policy*. The impact on voting is likely to be small as the endogenous response of political parties to news stories tend to keep voting intentions relatively constant.

Guided by these theoretical insights, this paper will look for effects of mass media on policy. The few earlier empirical investigations in this area, notably by Cook et al. (1983) and Protess et al. (1985), are mainly case studies of how the publication of particular news stories affected policy making. These studies find some evidence that media affects policy. However, the interpretation of their results are not obvious since it is very hard to ascertain the policy developments had the news stories not been publicized. This problem is aggravated by their finding that politicians deliver news worthy material to journalists when these politicians are seeking policy changes. News coverage may therefore be endogenous to future policy changes.

[1] Francis Bacon, Sacred Meditations, (1597).

[2] Berelson, Lazarsfeld and McPhee (1954), Campbell, Guerin, and Miller (1954), Campbell, Converse, and Miller (1960).

[3] See Iyengar and Kinder (1991) and Bartels (1993).

In contrast to these studies, this paper studies how the access to a mass medium, the radio, affected peoples ability to attract government funds. An advantage of this approach is that the increasing use of radio was the result of technical innovation and thus exogenous to the political process.

The innovation of a new mass medium may change public policy because mass media provide the bulk of the information people use in elections.[4] Further, mass media are not neutral devices, uniformly distributing information to everyone. Rather, each of the large mass media creates its specific distribution of informed and uninformed citizens, partly because of its specific costs and revenue structure. As a result, the characteristics of those informed also change when the mass media technology changes. For example, it is more costly to supply remote areas with newspapers than with radio waves. Radio can also more easily than newspapers reach the part of the population with reading difficulties. As a result, during the late 1930s, radio became the main information provider to low-education groups and rural listeners with less ready access to daily newspapers than people living in cities[5]. If better informed people are more politically powerful, then the introduction of the radio should have led to more favorable policies to low-education and rural groups.

Mass media's role in affecting policy is analyzed theoretically in section 2, which develops a model based on Strömberg (1998). In this model, information from radio is of importance both directly, through a *vote choice effect*, and indirectly via a *voter turnout effect*, see Figure 1.1. The *vote choice effect* arises because politicians use mass media to convey campaign promises to the electorate. The idea can be illustrated by an example. If a politician in the early 1920s would have promised to start a farm-subsidy program, the return in the form of rural votes might have been meagre as many rural voters did not have a daily newspaper and would not have been aware of this promise. Ten years later, this politician could go on radio and make the same promise directly to a much larger rural audience.

A *vote choice effect* may also arise if voters judge politicians by their past performance in office. Radio provides information about who is responsible for making cuts or increases in government programs, and voters who know these things can better hold politicians accountable. Therefore politicians should pro-

[4]For example, when a survey organization asked a cross section of American voters about their principal source of information in the 1940 presidential campaign, 52 percent answered "radio", and 38 percent "newspapers"(Gallup, 1940).

[5]Sterling and Kitross (1978).

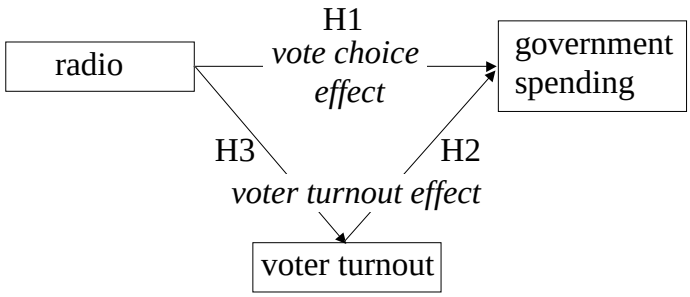

Figure 1.1:

vide more favorable policies to these voters. This role of mass media is analyzed in Appendix 1.

The reason for the *voter turnout effect* is straightforward. Although a politician may increase voter sympathies by promising favorable policies to some group, this will do the vote-seeking politician no good unless these more sympathetic voters actually turn out to vote. Therefore, politicians have stronger incentives to promise favorable policies to groups with a higher voter turnout. Studies of the determinants of voter turnout typically find that political knowledge is important[6]. Studies of the determinants of political knowledge, in turn, often find that media exposure, education, income, race, age, and gender are important[7]. Putting these facts together, the vote-seeking politicians should spend more money in areas with a large number of highly educated, rich, white, elderly, males who read newspapers and listen to radio broadcasts.

Section 2 concludes by formulating three hypotheses, illustrated in Figure 1.1. The first is the *vote choice effect* hypothesis, H1: politicians should allocate more government funds to areas where a larger share of the households have radios,

[6] Political knowledge is normally computed as an index based on replies to survey questions asking respondents to name political representatives and their stands on issues of the day, or questions about political institutional facts.

For example, Palfrey and Poole (1987) report a positive correlation between the amount of information a person had and her probability of voting in the 1980 presidential election. Delli Carpini and Keeter (1996, p. 224) find that in the 1988 American presidential election, "nearly nine out of ten of the most knowledgeable 10 percent of respondents voted. By comparison, among the least informed decile, only two in ten did so. In between, we observe a nearly monotonic increase in turnout as knowledge rises. "

[7] See Delli Carpini and Keeter (1996).

everything else equal. The remaining two hypotheses are the building blocks of the *voter turnout effect*. Hypothesis H2 states that politicians should allocate more funds to areas with higher voter turnout, and hypothesis H3 states that voter turnout should be higher where a larger share of the households have radios.

In section 3 hypotheses H1 and H2 are tested by examining whether the allocation of funds in a main New Deal program – the Federal Emergency Relief Act (FERA) – depended on the share of households with radios and on voter turnout. The FERA was a large, new program implemented during a period of rapidly increasing radio use (1933-1935). A cross section of county-level data comprising approximately 3 000 observations is used. Hypothesis H3 about the effect of radios on voter turnout is tested in a short panel consisting of county level data for the period $1920 - 1940$. A county-level investigation of all three hypotheses is possible since the 1930 and 1940 Censuses collected county-level data on the share of households with radios.

The empirical results support both a *vote choice* and a *voter turnout effect*. Figure 1.2 summarizes the main findings. The total effect of an increase in the share of households with radios by one percentage point is an increase in state FERA-spending to the county by 0.54 percent. Of this total effect, 0.47 percent is due to the *vote choice effect* and the remaining 0.07 percent to the *voter turnout effect*. The numbers in parenthesis are standard errors[8]. The s*wing vote effect* is substantially larger and the links of the *voter turnout effect* have substantially smaller p-values. The effects are not only highly significant statistically, but also economically important. The estimates imply that a one standard-deviation increase in the share of households with radios caused governors to increase spending to the county by 9 percent, on average.

Another interesting finding is that less funds were allocated to counties with a large number of illiterates. For every percentage point increase in the illiteracy rate, spending appears to have been cut by on average 2 percent. This finding is highly statistically significant, and also supports the notion that information affects the incentives for vote-seeking politicians.

The findings do not suggest that FERA money went to rich counties, where many happened to have radios and few were illiterate. In fact, including income and wealth variables in the regression makes the estimate of the coefficient on radio more significant. The reason is that radio is positively related to income

[8]The standard error on the effect of voter turnout on government spending is a linear transformation of the estimated standard error of the coefficient estimate of the logarithm of voter turnout.

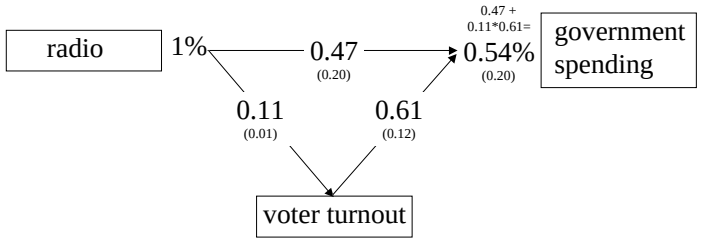

Figure 1.2:

and wealth, which are, in turn, negatively related to the need for relief funds. Excluding income and wealth from the regression introduces a downward bias in the estimate of the radio coefficient.

Section 4 discusses the federal allocation to states. Finally, section 5 discusses the results and concludes.

2. Model

In this section, I develop a model of political competition at the state level. In each state, two gubernatorial candidates simultaneously announce their election platforms. Some voters are informed about these platforms by mass media or other sources. Then all voters choose whether to vote and, if so, for whom. Finally, the winning candidate implements his platform.

The two gubernatorial candidates are indexed by r and d. State s has a population of n_s inhabitants indexed by i. This population is lives in C_s counties, indexed by c. Each county c has n_c inhabitants, and $\sum n_c = n_s$. The gubernatorial candidates' election platforms specify how much per capita spending z_c they promise to give to every county c in the state. These promises must be consistent with the budget constraint $\sum_{c=1}^{C_s} n_c z_c \leq I_s$, where I_s is a fixed state budget. Let z_c^d and z_c^r denote the per capita spending that candidates d and r respectively promise to give to county c.

Each individual i in county c derives utility $u_i(z_c)$ from per capita spending z_c in his county. As in Lindbeck and Weibull (1987), individuals also care about other fixed policies or personal characteristics of the candidates. This is captured by the individual specific preference parameters d_i and r_i. The utility that voter i would receive should the Democratic candidate be elected is $u_i\left(z_c^d\right) + d_i$, whereas

the voter would receive utility $u_i(z_c^r) + r_i$ should the Republican candidate be elected. Given their evaluations of the candidates, the inhabitants in the state choose whether to vote for candidate r, candidate d, or abstain from voting.

2.1. The gubernatorial candidates' problem

An individual in county c casts his ballot for the Democratic gubernatorial candidate if he turns out to vote, and if

$$\Delta u_i^e = E\left[u_i\left(z_c^d\right) - u_i\left(z_c^r\right)\right] \geq r_i - d_i.$$

Some voters are informed about what the candidates' have promised their counties: z_c^d and z_c^r. For this subset, $\Delta u_i^e = \Delta u_i = u_i\left(z_c^d\right) - u_i\left(z_c^r\right)$. The remainder of the electorate base their expectation on their knowledge of the equilibrium allocation. For these voters, $\Delta u_i^e = \overline{\Delta u}_i$, that is, a constant, independent of any campaign promises the candidates might make. The candidates assign probability distribution F_i to the difference $r_i - d_i$. They further assign a probability t_i that individual i will vote and a probability σ_i that he will learn about their campaign promises. From the candidates' points of view, turnout is fixed – it does not depend on variables they can control[9]. The probability that individual i will vote for the Democratic candidate is $t_i F_i(\Delta u_i^e)$, and the expected total votes of the Democratic candidate equals $\sum_{i \in s} t_i F_i(\Delta u_i^e)$.

The candidates maximize expected votes. For example, the Democratic candidate in state s solves

$$\max_{z_c^d} \sum_{i \in s} t_i \sigma_i F_i\left[\Delta u_i\right] + t_i\left(1 - \sigma_i\right) F_i\left[\overline{\Delta u}_i\right], \tag{2.1}$$

subject to the budget constraint

$$\sum_{c=1}^{C_s} n_c z_c = I_s.$$

Under the assumptions discussed in Lindbeck and Weibull (1986), this problem has a unique solution which is found by evaluating the first order condition of the above maximization problem at the point where both candidates choose the same

[9] Turnout does depend on whether the voters hear the election promise or not, but to simplify the exposition, this is not explicit in the notation.

allocation, $z_c^d = z_c^{r\,10}$:

$$\sum_{i \in c} \sigma_i t_i f_i(0) u_i' \left(z_c^d \right) = n_c \lambda_s. \tag{2.2}$$

Equation (2.2) contains all the model's insights about how a politician should allocate government funds. The expected gains from slightly increasing the allocation to county c are on the left hand side, while the costs, which are proportional to the number of people in the county, are on the right hand side. In equilibrium, the politicians equate the number of votes they get per dollar in each county to λ_s. If the number of votes per dollar were not equalized in equilibrium, then the politician could gain votes by moving funds to counties where votes were cheaper.

To understand the equilibrium allocation, study the left-hand side of equation (2.2). When a candidate promises a county marginally higher spending, the probability that a voter i will change his vote in favor of this candidate is proportional to the probability that the voter will hear this election promise, σ_i, that he will turn out to vote, t_i, and be sufficiently close to indifferent, $f_i(0)$, between voting for d or r to change his vote given his valuation of the extra money, $u_i'(z_c^d)$. If a politician promised the same allocation to all counties, then more votes would be gained on the margin in counties where σ_i, t_i, and $f_i(0)$, on average, are high. Therefore, votes would be cheaper in these counties. Realizing this, the politicians would increase the allocation to these counties, thereby pushing up the price of votes since $u_i'(z_c)$ is decreasing in z_c. In equilibrium, counties where σ_i, t_i, and $f_i(0)$, on average, are high will receive more funds.

More money will also be given to counties where people are more easily persuaded to change their votes in response to more generous campaign promises. That is, where $u_i'(z_c)$ on average is higher for any given level of z_c. This could, for example, be because that the extra money was more valuable to poor unemployed voters than to well-off voters. In the model, this will be captured by parameters in the utility functions:

$$u_i(z_c) = k - \frac{a_i}{\frac{1}{\alpha} - 1} (z_c)^{-\frac{1}{\alpha}+1}$$

The parameter a_i captures individual sensitivity, and the parameter α captures a common sensitivity to spending within the program. For the utility function to

[10] In the appendix, the same equations are generated as the equilbrium of a game with backward looking voters. See Lindbeck and Weibull (1987) or Strömberg (1998), for a more complete discussion of this type of equilibrium. Strömberg (1998) also contains a more detailed analysis of the underlying uncertainty for the voters.

be concave, a_i is assumed to be positive and α to lie in the open interval between 0 and 1. Inserting this functional form in equation (2.2) and using the budget constraint yields

$$\begin{aligned} \ln z_c &= \ln z_s + \alpha \ln(\sigma_c) + \alpha \ln\left(\frac{t_c}{t_s}\right) + \alpha \ln(f_c(0)) + \alpha \ln(a_c) \\ &\quad + \alpha \ln(\rho_c) - \alpha \ln(\sigma_s f_s(0) a_s \rho_s), \end{aligned} \tag{2.3}$$

where subscript c denotes county averages and subscript s denotes state averages, and

$$\rho_c = \frac{1}{n_c} \sum_{i \in c} \frac{\sigma_i}{\sigma_c} \frac{t_i}{t_c} \frac{a_i}{a_c} \frac{f_i(0)}{f_c(0)}.$$

A county is with higher than state average values of $\sigma_c, t_c, f_c(0)$, a_c and ρ_c will receive higher than state average level of spending, z_s. The reason why spending is increasing $\sigma_c, t_c, f_c(0)$, and a_c has been discussed above. It is also increasing in the interaction term, ρ_c. This term implies that if two counties have the same levels of average $\sigma_c, t_c, f_c(0)$, and a_c, then more money should be given the county where exactly those individuals within the county who are most sensitive to spending also are better informed, have higher voter turnout, and are more likely to be marginal voters than average.

The above equation contains two central empirical predictions. First, the coefficient α on the voter turnout variable is positive. This is a more precise formulation of hypothesis H2: politicians should spend more money per capita in counties where a larger share of the population votes. Second, σ_c is assumed to be increasing in r_c, since empirical studies have shown that political knowledge is positively related to radio use[11]. Therefore the share of households with radios, r_c, has a positive effect on relief spending which is independent of the effect via voter turnout. This is a more precise formulation of hypothesis H1: politicians should spend more money in areas where a large share of the population has a radio.

Note that a Benthamite social planner, maximizing the unweighted sum of utilities, would allocate funds according to equation (2.2) evaluated at $\sigma_i = t_i = f_i(0) = 1$. Therefore, under the alternative hypothesis that government funds were allocated by a social planner, the allocation should *only* depend on a_c.

[11] See example Delli Carpini and Keeter (1996, p.144)

2.2. Voter turnout

Voter turnout in county c, t_c, is assumed to be a function

$$t_c = b_1 r_c + X_{c2}\beta_2 + \varepsilon_{c2}, \tag{2.4}$$

where r_c is the share of households in the county with radios, and X_{c2} contains other variables related to the costs and benefits of voting which will be specified in the empirical section. Hypothesis H3 states that the coefficient b_1 in the above equation is positive.

Voter turnout is likely to be increasing in to the share of households with radios since people who listen to radio are better informed about politics, and since people who are better informed about politics vote more often.[12] Perhaps better informed people vote more often because they feel that they are more likely to makes the right choice in case their vote is pivotal; see Matsusaka (1993), and Feddersen and Pesendorfer (1997). It could also be that people like to fulfill a perceived citizen duty (Riker and Ordeshook, 1968) of making an informed choice in the election.

3. Data and econometric issues

These hypotheses of media effects on policy were tested on the FERA program. This was a large, new program that was implemented during a period of rapidly increasing radio use. If the radio increased the political strength of certain groups or regions, then one should expect a new, major program to target these groups, to some extent. The FERA program was implemented from 1933 to 1935. It distributed $3.6 billion, which can be compared with total – federal, state, and local – government expenditures which were around $12 billion at the time. The program funds were widely distributed, at their peak reaching around 16 percent of all Americans – more than 20 million people. At the county level, total FERA spending per capita, z_c, ranged from 4 cents to $226, with a mean of $20 and a standard deviation of $15; see Table 1.

The FERA program was implemented in the middle of radio's expansion period, an ideal time for this type of study. At the beginning of the FERA-program in 1933, radio was established as an important mass medium. Already in 1930, NBC-Blue had started the first regular – five times a week – 15 minutes hard news

[12] For empirical evidence, see for example Palfrey and Poole (1987) and Delli Carpini and Keeter (1996)

broadcasting; an initiative soon followed by the other networks. In the 1932 presidential election, the two parties spent nearly $5 million on radio campaigns, with 25 percent going to national hookups. Radio covered politics both at the state and the federal level[13]. By 1937, 70 percent of the American public reportedly depended on the radio for their daily news[14]. Radio was also considered a credible media: 88 percent of the American public thought that radio news commentators truthfully reported the news[15].

Still, in the early 1930s, radio ownership was very unevenly distributed across the United States. Receivers were concentrated in the North East, the Mid-Western cities, and in the Far West. The share of the households in the county with a radio receiver, r_c, ranged from 1 percent to 90 percent, with a mean of 26 percent and a standard deviation of 18 percent. This exceptional variation in radio use should make it easier to identify effects of radio use on spending, since the variation in government spending due to radio effects should also have been exceptionally large during this period.

3.1. Specification

Data on FERA spending was collected from the final statistical report of this program.[16] Radio data collected from the 1930 Census of the Population.[17] Data on voter turnout in gubernatorial[18] and presidential[19] elections was collected from the ICPSR archives. Data on sales at filling stations was collected from the Census of Business,[20] and data on bank deposits was collected from the Federal Deposit

[13] For a good discussion of the early history of radio, see Stirling and Kitross (1978).

[14] Gallup (1937).

[15] Gallup (1939)

[16] *Work Projects Administration, Final Statistical Report of the Federal Emergency Relief Administration*, Washington: US. Government Printing Office, 1942.

[17] Fifteenth Census Reports, 1930, Population, vol. VI, Families, Table 20.

[18] Source: UNITED STATES HISTORICAL ELECTION RETURNS, 1824-1968, ICPSR #1.

[19] Clubb, Jerome M., William H. Flanigan, and Nancy H. Zingale. ELECTORAL DATA FOR COUNTIES IN THE UNITED STATES: PRESIDENTIAL AND CONGRESSIONAL RACES, 1840-1972 [Computer file]. Compiled by Jerome M. Clubb, University of Michigan, William H. Flanigan, University of Minnesota, and Nancy H. Zingale, College of St. Thomas. ICPSR ed. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [producer and distributor], 1986.

[20] Census of Business: 1935, Retail Trade Survey, US Department of Commerce, Bureau of the Census.

Insurance Corporation.[21] The remaining variables are based on US Census data contained in the ICPSR archives.[22]

The empirical variables used to estimate equation (2.3) are discussed roughly in the order they appear in Table 1. The first column contains the variables from the theoretical model. The second column contains a sign indicating whether the relation between the theoretical and the empirical variable is positive or negative. Subscript s denotes state-level aggregation, variables without subscripts are measured at the county level. The exact definitions of the empirical variables are given in Appendix 2.

As mentioned, the share of the voters who knows the candidates election platforms, σ_c, is assumed to be positively correlated with radio use. It is also assumed to be negatively correlated with illiteracy and positively correlated with school enrollment. The latter variables are included since recent studies have found that knowledge about politics is increasing in educational attainment.[23]

The variables t_c and $f_c(0)$ should apply to the gubernatorial elections, since the governors were responsible for the allocation of FERA spending within the states. The FERA was not a federal program, but a state and local program in which the federal government cooperated by making grants-in-aid. After a grant had been approved by the federal government to a state, the amount was forwarded to the governor. The governor, in turn, made money available to local relief administrations. The FERA provided basic rules concerning eligibility for relief, but state and local emergency relief administrations made the final decisions on who would receive relief and how much relief was to be given.

The situation in the gubernatorial elections varied greatly. In the South, the Democrats dominated the political scene. In most counties in Georgia and South Carolina, the democrats got *every* vote in *all* elections 1917-1934. In Georgia, Mississippi, and South Carolina, only a few percent of the population voted. In these states, allocating the budget in order to win elections was probably of small importance in comparison to other aspects not treated in this paper. Therefore, results for a subsample excluding states with winning margins greater than 30 percent will be reported separately. In this sample, votes per capita at the state

[21]FEDERAL DEPOSIT INSURANCE CORPORATION DATA ON BANKS IN THE UNITED STATES, 1920-1936 [Computer file]. ICPSR ed. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [producer and distributor], 196?.;

[22]HISTORICAL, DEMOGRAPHIC,ECONOMIC, AND SOCIAL DATA: THE UNITED STATES, 1790-1970 [Computer file]. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

[23]See for example Delli Carpini and Keeter (1996).

level was typically around 30-40 percent with a maximum of 50 percent in Illinois. Below, votes per capita will be called "voter turnout" although this term normally denotes average votes per eligible voter.

The marginal voter density, $f_c(0)$, has been estimated using data on the variation and mean of county election outcomes 1917-1933.[24] The measure is similar in spirit to the political productivity index of Wright (1974). Another political productivity variable is *share partisans*. It may be the case that a governor knows better who is in need of support among his own supporters, and therefore can allocate money efficiently to this group. Dixit and Londregan (1994) show that the model of this paper could easily be extended to include this feature[25]. Including *share partisans*, the share of the voters supporting the winning gubernatorial candidate, makes it possible to test whether governors were "taking care of their own" in this way.

Clearly, a_c is the theoretical variable which is most loosely tied to any specific empirical variable. The parameter a_c measures the value of the FERA spending to its recipients. To get some idea of what the politicians of the time believed to be important for the sensitivity to program funds a_c, I have looked at a recommendation of the FERA. In this recommendation, local relief agencies were advised to subtract the income of a family from a minimum subsistence budget to compute the transfer to which each family was eligible.[26] In accordance with this recommendation, a measure of a_c could include income, wealth, and some cost of living measure.[27]

I have found no direct measures of income and wealth at the county level. Instead, variables which are arguably highly correlated with income and wealth are used. The average wage in the retail sector[28] and the per capita value of all

[24] Election outcomes between 0 and 1 have been mapped to preference shocks between plus and minus infinity using a inverted standard normal distribution. Then the mean and variance of these preference shocks have been calculated and using these the marginal density has been calculated. This corresponds to a maxmimum likelihood estimation of these distribution parameters under some additional assumptions. For further details, please contact the author.

[25] See also Cox and McCubbins (1986)

[26] See 'Final Report On the WPA Program, 1935-43', p. 3.

[27] An alternative way to discuss differences in sensitivity to spending would be to assume that all individuals have the same utility function, but different endowments prior to the government transfer. This would lead to similar predictions: the sensitivity to additional government transfers would be decreasing in income and wealth.

[28] The simple correlation between the average wage in the retail sector and per capita personal income at the state level, where income data exist, is 0.8. The reason that the average wage in manufacturing is not used is that there are many observations missing from this series.

crops harvested are used because they are thought to be highly correlated with income in urban and rural areas respectively. Similarly, bank deposits, the median value of owner-occupied dwelling units, and the per capita value of farm buildings are used because they are assumed to be correlated with wealth, and the median monthly rent is used because of it may be correlated with the cost of living. Not only average income, but also the distribution of income may be important. Therefore, the share of the population that was unemployed in 1930 and in 1937 are included. Apart from the unemployed, special groups such as 'the aged, mothers with dependent children, youths' are enumerated in the recommendation by FERA as groups of needy persons. The share of the population aged over 65, the share of females, and the share aged below 21, are used for measuring the occurrence of these special groups. The share of African Americans and the share of immigrants may be correlated with need aspects not captured by the other variables, and these variables are also included.

Since there is no individual-specific data, the within-county interaction term, ρ_c, can not be measured and is part of the county-specific error. Finally, a number of control variables will be included in the regression.

The above set of variables is substantially larger than that used in earlier studies of the federal allocation of New Deal money to states to be discussed in Section 4. Still, two potentially important variables are not included because county-level data has not been found: the share of federal land in the state, and the fall in income 1929-1933 (Reading, 1973). However, since the federal government had no formal control over the allocation of FERA grants within the states, it is not clear that the share of federal land is important in this study. To compensate the absence of the fall of income variable, the change in bank deposits, 1930-1934 is included in the regression. Gas sales per capita is included since it is likely to be correlated with car ownership (of which data was not collected in the 1930 Census). If radio use is statistically correlated with spending simply because it proxies for some unobservable characteristic correlated with buying new consumer goods, then one should expect car ownership to behave in a similar fashion as radio ownership.

The next step is to specify what variables to include in the regression on voter turnout, equation (2.4). The closeness of the gubernatorial election is included, because it may be related to the benefits of voting (Riker and Ordeshook, 1968). In addition, all of the variables that affect relief spending are included because they may also affect voter turnout. Personal characteristics such as sex, age, race, education and income may influence the costs of voting; see for example

Ashenfelter and Kelly (1976), Wolfinger and Rosenstone (1980), and Teixeira (1992). Sex and race are also likely to be more important in the 1930s than in these more recent studies. The extension of the franchise to women was fairly recent (1920), and African Americans were at the time disenfranchised in the South. Immigration is included because of residence requirements for voting. The urban share of the population, population density, and unemployment, are included because they may affect the cost of voting. However, a number of institutional features which have been found to be important for voter turnout – poll taxes, literacy tests and registration laws[29] – are not included. The reason is that there is little time series variation in these variables. In the panel study, county dummy variables are included to pick up the effects from these variables.

Except for voter turnout in equation (2.3), theory says nothing about which functional forms should be used. The simplest linear form is chosen. To simplify the interpretation of the coefficients, all variables which are not shares are in logs. Thus, one may interpret all coefficients as the percentage response of the dependent variable to a percentage change in the independent variable.

A few further decisions concerning the appropriate sample to test this hypothesis are required. First, there was no contested election in South Carolina in the 1930s until 1938. Therefore South Carolina is excluded from the analysis, which leaves us with 2921 observations. Second, a number of the series contain missing values, notably gas spending per capita, crop value per capita, median value of owner occupied dwelling, and monthly rent. The exclusion of all observations with missing values leaves us with 2496 observations. The possible selection bias from this narrowing of the sample is discussed below. Further, in some areas, voter turnout was reportedly higher than 100 percent of the population. This was true for St. Louis, Missouri, in gubernatorial elections, and for St. Louis, Missouri; Loving, Texas; and Baltimore, Maryland, in presidential elections. A plot suggested that these observations are outliers and they have been omitted. None of the results presented change when these outliers are included in the regressions.

The simple correlation between per capita relief spending and the share of households with radios is 0.29, similar to the simple correlation between per capita relief spending and voter turnout, which is 0.31. Voter turnout in gubernatorial elections is strongly correlated with the share of households with radios; the correlation is 0.64.

[29] See Wolfinger and Rosenstone (1980).

3.2. Results

This section contains a discussion of the structure of the econometric problem and the assumptions behind it, the estimation, and a discussion of potential econometric difficulties and some measures to avoid these.

Substituting the empirical variables from Table 1 into equations (2.3) and (2.4) yields:

$$\ln(z_c) = c_1 r_c + c_2 \ln\left(\frac{t_c}{t_s}\right) + X_{c1}\beta_1 + \varepsilon_{c1}, \tag{3.1}$$

$$t_c = b_1 r_c + X_{c2}\beta_2 + \varepsilon_{c2}. \tag{3.2}$$

Matrices X_1, and X_2 contain the exogenous variables discussed above. It is implicitly assumed in the structure of the equations, that the voter turnout in 1933-36 is not directly affected by spending within the program. If the errors in the above equations are uncorrelated, then the recursive system may be consistently estimated using equation by equation OLS.

3.2.1. Spending

Let us first turn to the estimation of equation (3.1), determining FERA spending. The main theoretical predictions are that spending should be high where many households have radios and where voter turnout is high:

$$c_1 > 0, c_2 \in (0,1).$$

The coefficient c_1 is approximately the percentage increase in per capita spending due to a one-percent increase in the share of households with radios.[30] The coefficient c_2 corresponds to parameter α in the utility function, which is restricted to lie in the open interval between 0 and 1.

A number of specifications of equation (3.1) were tested. Table 2 presents results from the full sample while Table 3 presents results only from states where the winning margin was less than 30 percent. This excludes the Southern states and Washington. As discussed, the reason for this exclusion is that it seems unlikely that the FERA money was allocated to influence the election outcomes in states that were completely dominated by one party.

[30] Although there is no formal limit to the size of c_1, it is reasonable to expect that it should be lower than 3.4. To see why, consider the extreme case where those and only those with radios receive money from the program. An increase from the average of 29 percent to 30 percent of the households having radios implies that spending increases proportionally, that is, an increase by $1/.29 = 3.4$ percent.

The organization of Tables 2 and 3 is the same. The rows containing the estimates of c_1 and c_2 are in boldface. Columns A and B contain the theory variables and the expected signs of the coefficients respectively. The specifications in columns I-III do not allow for state-specific effects while the others do.

Columns I and IV show the basic specification without and with state-specific effects respectively. The estimate of c_1 is positive and significant at the 1 percent level, except in the when allowing for state-specific effects and including elections with winning margins greater than 30 percent. In this specification c_1 is significant at the 5 percent level. The estimate of c_2 fall within the predicted interval and is significant at the 1 percent level in all specifications. The measured effects are also economically significant. The estimates of column IV in Table 2 imply that an increase in the share of housholds with radios by 1 percent will increase spending by 0.47 percent, and an increase in voter turnout by one percent will increase spending by $\frac{0.18}{0.30} = 0.61$ percent.[31] Note that the estimated values of c_1 and c_2 are larger when states with winning margins greater than 30 percent are excluded from the sample (Table 3). This indicates that allocating funds to win the election was less important in states dominated by one party.

There may be a *simultaneity* problem in this specification if FERA spending increased voter turnout 1933-36. This would cause voter turnout to be positively correlated with ε_{c1} and the coefficient estimate of c_2 to be positively biased. To avoid this potential bias, voter turnout 1933-36 is instrumented by voter turnout prior to 1932, and vote shares 1933-36 are instrumented by vote shares prior to 1932. This produces small changes; see column II.

Another way to deal with this simultaneity problem is to study a reduced-form equation where voter turnout is not included. Make a first order Taylor expansion of log turnout in equation (3.1). Then substitute out voter turnout using equation (3.2). The result is an equation of the form

$$\ln(z_c) = d_{0s} + d_1 r_c + X_c\beta + \varepsilon_{c3}.$$

This formulation avoids the simultaneity problem since both ε_{c1} and ε_{c2} end up in ε_{c3}. An estimation of the above equation also provides a measure of the total effect of radios, d_1. This total effect is the sum of the *vote choice* and *voter turnout effects.* The result is shown in column III. The regressions reported in column IV, V and VI, are the same as I, II and III, respectively but allow for state effects.

In the above specifications, around 15 percent of the observations are not included due to missing values. In case the omitted observations are not represen-

[31] The effect is evaluated at the mean of 0.3 of voter turnout.

tative, this may create a *sample selection bias*. In column VII, a few data series with many missing values have been omitted. With this smaller set of variables, only 6 percent instead of 15 percent of the observations are omitted due to missing values.

A final concern is that of *measurement errors*. Income and wealth are negatively related to the need for relief spending, but also positively related to the share of households with a radio. If income and wealth are measured with error, then the estimate of c_1 will be negatively biased, and the estimated effect of radios on spending will be lower than the actual effect. To minimize this bias, a number of variables correlated with income and wealth should be included in the regressions.

In the introduction it was argued that radio should matter more in rural than in urban counties. The last column, VIII, show that the effect of radios was significantly larger in rural than in urban counties. This result will be discussed below.

Hypotheses H1 and H2 are not rejected in any of the above specifications. The estimates of c_1 are significant at the 1 percent level, expect when including elections with winning margins greater than 30 percent and allowing for state effects. In these specifications c_1 is significant at the 5 percent level. (Note that c_1 is not estimated in columns VI and VIII.) The estimates of c_2 is always significant at the 1 percent level.

Of the other variables related to political knowledge, illiteracy is always significantly negatively related to FERA-spending. The school enrollment rate among people aged 7-18 is always positively, and sometimes significantly, related to FERA-spending. The less convincing result for the school enrollment rate variable may be due to the fact that it does not measure the stock of knowledge very well and due to the high correlation between schooling and illiteracy.

The marginal voter density is only significant when state effects are not allowed for. Perhaps this reflects that this variable is not measured correctly. The marginal voter density is not observable. In order to estimate it, strong assumptions on the distribution of preferences are necessary. The share voters supporting the winning gubernatorial candidate (partisans) is also significantly and positively affects spending to the county mainly in specifications that do not allow for state effects.

Of the variables related to need, a_c, the most important variable explaining FERA-spending is the share of the population that was unemployed. Bank deposits is consistently significantly negatively related to FERA-spending, as is the

value of farm buildings. The change in bank deposits is negatively related to FERA spending when the Southern states and Washington are excluded. Unexpectedly, crop value per capita is sometimes significantly positively related to FERA-spending and the share over 65 is often significantly negatively related to FERA-spending.

Although important, the data strongly rejects the hypothesis that *only* variables related to need mattered. The alternative hypothesis that a social planner without political motives allocated the FERA funds is thus rejected.

3.2.2. Voter turnout

Let us turn now to the estimation of equation (3.2), determining voter turnout. Theory predicts that $b_1 > 0$, and it is reasonable to expect that the coefficient is smaller than 1. The coefficient b_1 measures the percentage change in votes per capita due to an increase of one percent in the share of households with radios.

The results are shown in Table 4. The estimates of b_1 fall within the predicted interval and are significant. The estimates imply that an increase in the share of households with radios of one percent will increase voter turnout by $0.07 - 0.09$ percent.

In this estimation, there may be an important *omitted variable* bias. People in counties where many are interested in politics may be both more likely to have a radio and more likely to vote. To be able to control for this and other county-specific effects, a panel data set was constructed. This panel data set contains most of the important explanatory variables at the county level in 1920, 1930, and 1940, and voter turnout in gubernatorial elections around 1920, 1930, and 1940.

The results are shown in Table 5. Election-year effects are allowed in the last four equations, but not in the first three. Looking at changes between 1920 and 1930, the fixed effects estimate of b_1 is 0.11, and highly significant, see column II. The estimate is virtually the same with election year effects, see column V. The fixed effects estimates are relatively stable over time, as can be seen in the other columns of Table 5.

Panel estimates without fixed effects are shown in Table 6. The estimates of b_1 are comparable to the fixed effects estimates. The similar results from estimations with and without fixed effects indicate that the omitted variable bias might not be a serious problem. In a sense, this is not be surprising. Most of the programming time was devoted to entertainment, and people most likely bought radios for entertainment and perhaps practical information such as weather news for farmers.

Interest in politics was probably a minor determinant of radio ownership.

The most relevant estimates of b_1 are those based on changes from 1920 to 1930, reported in Table 5, columns II, V, and VI. These estimates are all around 0.11 and highly significant. The hypothesis H3 that radio use increased voter turnout is not rejected by the data.

3.3. Discussion of other results

In the introduction, it was hypothesized that radio was particularly important in improving the information to rural listeners and illiterates; and that radio improved these groups ability to get favorable policies. To test this, the share of households with radios was interacted with a dummy variable for the 1419 counties with only rural households. The results indicate that the *vote choice effect* was significantly higher in rural counties; see Table 2, and Table 3, column VIII. Radio's impact on turnout was also significantly higher in rural counties than in urban counties; see Table 5, column VI. The estimates imply that radio increased the ability of rural America to attract government transfers. In quantitative terms, radio is estimated to have increased the funds allocated to a rural county relative to an identical urban county by 20 percent.

Moreover, some results in the regression of voter turnout are worth mentioning. The estimated size of b_1 of about 0.1 implies that, on average, one out of every ten persons who got a radio started to vote because of the radio. The aggregate effects of radio on voter turnout are far from negligible. In 1920, less than one percent of the population used radios. By 1940, around 80 percent of the households had radios. The estimate suggest that this would have led to an increase in votes per capita of around 8 percent. Between 1920 and 1940, votes per capita in the US increased by about 12 percent, from 25 to 37 percent, in both Gubernatorial and Presidential elections. According to the estimates, the increase would only have been one third as large without the radio. The estimates are based on time-series variation using year dummy variables, so they are not merely picking up the time trend in both series.

The results are consistent with a model where the voter calculates the probability of being pivotal in the election. The winning margin, i.e. the closeness of the election, is negative and significant in all specifications except in the fixed effects regression over the time period $1920 - 1930$. Furthermore, the coefficient on the interaction term between radio and the closeness of the election is always negative and significant. It thus seems that the effect of radios on turnout is higher when

the margin of the election is close. One explanation for these findings is that people are more likely to turn out to vote if they think that it is more likely that their vote will change the outcome of the election. In areas where many people have radios, a larger share of the voters would know when the election would be close, thus causing the interaction effect. An alternative explanation is the following. People who know the names and platforms of political candidates' are more likely to vote. Close elections are followed more extensively in the media. Therefore more people learn about names and platforms of the candidates in close elections, and this makes a larger number of people to vote. This effect would, of course, be larger in areas where more people have radios, creating the interaction effect.

4. Extension: Federal level

This section presents some evidence that radio use also affected the *federal* allocation of grants to states. This finding is closely related to the central question of previous studies of the allocation of New Deal funds to states: did the Roosevelt administration spend money to promote their stated goals by giving money to states in need of relief, or to promote other political goals? Arrington (1969) found that spending did not seem to promote equity between states but rather to favor states with high incomes. Wright (1974) attacked this "oddity" by incorporating a number of variables capturing the political benefits to the president of spending. His political variables had significant explanatory power suggesting that money was spent partly for political purposes. Anderson and Tollison (1991) investigated whether congressional influence was also important. Their results indicate that states whose representatives held influential positions in the Congress were treated favorably. Wallis (1996) has examined the findings of Wright and Anderson and Tollison closer using panel data. Wallis finds that while Wright's presidential variables seem to matter much during the New Deal, congressional factors are more important in the long run.

The model of federal FERA allocation will be based on presidential, rather than congressional, electoral considerations. This is based on the empirical evidence in Wallis (1996), and on accounts that Congress allowed Harry Hopkins – the head of the FERA, appointed by Roosevelt – to allocate the lions share of the FERA funds at his discretion (Wallis, 1991).

The empirical specification below is derived in Strömberg (1999) which extends the model presented in this paper to include a stage where presidential candidates allocate grants to the states, before the gubernatorial candidates allocate

their given budget within the states.[32] Gubernatorial candidates in this model care about winning a majority in the election, and the presidential candidates care about winning a majority in the electoral college. The resulting equation determining FERA-spending to county c in this model is a natural extension of equation (3.1) determining spending within states:

$$\begin{aligned} \ln(z_c) &= c_0^{'}\frac{r_c}{r_s} + c_2 \ln\left(\frac{t_c}{t_s}\right) + \\ & \quad c_{12}^{'}\frac{r_s}{r} + c_{22}^{'} \ln\left(\frac{v_s/n_s}{v/n}\right) + X_3\beta_3 + \varepsilon. \end{aligned} \tag{4.1}$$

The predictions of the theory are:

$$c_1^{'}, c_{12}^{'} > 0, c_2 = \ c_{22}^{'} \in (0,1)\,.$$

Allocation within states is affected by the share of households in the county with radios, r_c, relative to the state mean, r_s, and per capita votes the gubernatorial elections in the county, t_c, relative to the state mean, t_s. The new feature is that federal spending to states is affected by the share of households in the state with radios, relative to the national mean r. Federal spending to counties is also affected by the number of *electoral* votes per capita, v_s/n_s, relative to the national average, v/n. The results are reported in Table 7.

The *vote choice effect* of radios on federal spending – measured by $c_{12}^{'}$ – is both large and highly statistically significant. The estimate implies that an increase in the state share of households with radios by one percentage point will increase federal spending by $0.51/0.4 = 1.3$ percent, evaluated at the national average share of households with radios, 0.4. The estimated impact of radios is thus larger at the federal level than at the state level. The effects of the number of electoral votes per capita on federal spending are only significant when the South is included in the sample. Finally, it is important to note that radio may not affect the federal allocation of grants indirectly via voter turnout. The presidential candidates care about the number of *electoral* votes per capita, which are based on population size and not affected by radio use.

5. Conclusion and discussion

Mass media affects politics because it carries politically relevant information to the voter. This makes media users more responsive to campaign promises, and

[32] See also Dixit and Londregan (1998).

more likely to vote. For these reasons, politicians should target voters using mass media. The empirical evidence presented in this paper suggests that such targeting did indeed take place in the US of the 1930s: governors allocated more relief funds to areas where a larger share of the population had radios. The effects are not only highly statistically significant, but also economically important. The estimates of this study imply that for every percentage point increase in the share of households with radios in a certain county, the governor would increase per-capita relief-spending by 0.5 percent. A one standard-deviation increase in the share of households with radios would increase spending by 9 percent, and a change from the lowest to the highest share of households with radios in the sample would increase spending by 41 percent.

The effect of illiteracy is another piece of evidence suggesting that information creates strong incentives for politicians. The governors did allocate less relief funds to areas with a large share of illiterate people. Like the radio, illiteracy may hurt voters because illiterates are less likely to be informed about campaign promises, and about who is responsible for cuts in the programs they are using. But illiteracy also indirectly hurts voters because illiterates vote less frequently than other people. The effects of illiteracy are highly significant and considerable. For every percentage point increase in the illiteracy rate, governors cut spending by 2 percent, on average.

The above findings point to the need for an information-augmented theory of the growth of government. In Meltzer and Richard's (1978, 1981, 1983) classical theory, the enlargement of the voter franchise to the poorer segments of the population leads to increased redistribution towards the poor.[33] The findings in this paper support the idea that groups with a high voter turnout are more successful in attracting redistributive spending. However, this paper also finds that people without a radio, and people who were illiterate, were less successful in attracting redistributive spending, over and above the effect via voter turnout. This implies that although allowing the poor the right to vote is important, it does not grant them equal political power. If politicians understand that the poor do not know who is promising them more welfare, they will promise only little. If politicians understand that the poor do not know who is responsible for the cuts in welfare, they may cut welfare without risking votes. Given the estimated effects of radio use and illiteracy compared to voter turnout, the role of information in elections may be as important for explaining the growth of government as the expansion of the voting franchise.

[33]For a recent test of this hypothesis, see Husted and Kenny (1997).

Radio also seems to have improved the relative ability of rural America to attract government transfers. The estimated *vote choice effects* and *voter turnout effects* are significantly larger in rural areas. In total, radio is estimated to have increased the funds allocated to a rural county relative to an identical urban county by 20 percent.

Another topic deserving discussion is the apparent discrimination of African Americans in the FERA program. In counties with a large share of African Americans, income was lower than average, and unemployment (in 1930) was higher than average. Still, the simple correlation between the share of African Americans and relief spending is negative. The reason is that these counties have characteristics that make them politically weak. First and foremost, illiteracy rates are high. In 1930, the illiteracy rate among African Americans was ten times that among white, native born, Americans: 16 percent compared to 1.6 percent. Second, the voter turnout rate is low and third, few households had radios in counties with many African Americans.

Interestingly, there is no remaining discrimination once illiteracy, voter turnout, and radio use have been accounted for; see Table 2. This suggests that to understand discrimination is to understand why these counties had a larger number of illiterates, fewer citizens who voted, and fewer households who used radios. It also suggests measures that would have alleviated this problem: providing people in these counties with better education, eliminating the discretionary use of eligibility rules that were used in the South[34], and giving them access to daily mass media.

[34]See Ashenfelter and Kelley, (1975).

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6. Appendix 1: A simple model of retrospective voting

This model illustrates how information via mass media might matter if voters judge politicians on basis of past performance. The idea is that mass media inform the public about which politician is responsible for making a cut or increasing spending in government programs. Therefore voters who use mass media are more likely to connect a program they care about with a political officeby (Popkin, 1991), and to hold politicians accountable for making cuts or increases in these programs. This increases the politicians' incentives to target these voters.

Without loss of generality, assume that the incumbent governor is a Democrat, indexed by d, competing for votes with an unknown Republican challenger, indexed by r in state s by deciding how large a share of the state budget, I_s, will be allocated to each county in the state. There are C_s counties, indexed by c. Let z_c be per capita relief spending, and n_c denote the number of inhabitants of county c, with $\sum n_c = n_s$, the number of inhabitants in the state. The budget constraint is $\sum n_c z_c = I_s$.

The incumbent allocates the budget and the voters learn the allocation from experience. Some voters learn that the allocation of z_c is the responsibility of the governor, from mass media or from other sources. The voters choose whether to vote and, if so, for whom.

Each voter i in county c derives utility $u_i(z_c)$ from per capita spending z_c in his county. Individuals also care about other policies where Democrats and Republicans have fixed positions. These preferences are captured by the individual preference parameters d_i and r_i. The utility from the platform of the incumbent governor is $u_i\left(z_c^d\right) + d_i$. Some voters know that the governor is responsible for the allocation of z_c^d, others do not. Let the variable $\xi_i = 1$ if the voter knows that the governor is responsible for this allocation and $\xi_i = 0$ otherwise. Voter i follows the voting rule to cast his ballot for the incumbent, if his utility was higher under incumbent d than some exogenous reservation utility $\overline{u}_i$:

$$\xi_i \Delta u_i = \xi_i \left[u_i\left(z_c^d\right) - \overline{u}_i\right] \geq r_i - d_i.$$

and for candidate r otherwise.

For individual i, the governor assigns a probability distribution F_i to the difference $r_i - d_i$, a probability t_i that the voter will vote, and a probability σ_i that the voter knows that the governor is responsible for the spending level z_c. From the governor's points of view, turnout is fixed – it does not depend on vari-

ables that he can control[35]. The probability that individual i will vote for the incumbent is $t_i F_i(\xi_i \Delta u_i)$, and the expected total votes of the incumbent equals $\sum_{i \in s} t_i \sigma_i F_i(\Delta u_i) + t_i (1 - \sigma_i) F_i(0)$.

The candidates maximize expected votes

$$\max_{z_c^d} \sum_{i \in s} t_i \sigma_i F_i(\Delta u_i) + t_i (1 - \sigma_i) F_i(0), \tag{6.1}$$

subject to the budget constraint

$$\sum n_c z_c = I_s.$$

If the governor increases spending marginally, only those informed about the fact that the governor is responsible for this increase will change their votes in response. The allocation is determined by the first-order condition to the governors' problem:

$$\sum_{i \in c} \sigma_i t_i f_i(\Delta u_i) u_i' \left(z_c^{d*} \right) = n_c \lambda_s \tag{6.2}$$

and the budget constraint

$$\sum n_c z_c = I_s.$$

The equilibrium has the same form as equation (2.2), the only difference is that f_i is evaluated at Δu_i instead of at zero. This has the empirical implication that $f_i(\Delta u_i)$ will depend on the dependent variable z_c and should be instrumented. Apart from this, the empirical specification is the same. Relief spending will be increasing in the share of voters who knows that the governor is responsible for relief spending, σ_c, in the share who turns out to vote t_c, and in the likelihood that the voter is close to indifferent between the candidates, $f_i(\Delta u_i)$, and in the marginal sensitivity to more funds, $u_i' \left(z_c^{d*} \right)$.

Unlike the model in section 2, equilibrium spending may now affect vote shares. Whether equilibrium spending affect vote share depends on the specification of $\overline{u}_i$. First, assume that voter i follows the voting rule to cast his ballot for the incumbent, if his utility was higher under incumbent d than the utility the voter expected, had r been in office. The only rational expectations equilibrium in this case is that both candidates choose the same allocation when in office, and that $\Delta u_i = 0$. The equilibrium equation is then exactly the same as equation (2.2), characterizing allocation in the model of section 2. In this formulation, spending has no equilibrium effect on votes. The reason is that politically powerful

[35] This is a more problematic assumption in this formulation of the model.

counties expect to receive high transfers. They do not particularly award an incumbent for high levels of benefits, since they realize that the political incentives would force any incumbent to be equally generous to the county. Any other specification $\overline{u}_i$ yields equilibrium effects on aggregate vote shares. For example, suppose that the voter uses the simple rule $\overline{u}_i = u_i\left(z_{c,t-1}\right)$. That is, the voter's performance benchmark is spending during the previous election period. In this case, an increase in the level of spending will have a positive effect on votes. This formulation is consistent with the findings of Levitt and Snyder (1997), that incumbents spending more than the time-series average in an electoral district will gain votes.

Table 1. Summary statistics

Theoretical variables		Empirical variabes	mean	st. dev	min	max
$z_c =$		FERA spending/capita	20.51	15.53	0.12	225.67
$z_s =$		FERA spending/capita$_s$	25.80	11.16	9.50	57.14
$\sigma_c =$	+	share hhlds with radios	0.29	0.17	0.01	0.78
	−	share illiterate	0.03	0.04	0	0.35
	+	school enrollment,	0.75	0.06	0.38	0.88
$t_c =$		votes/capita	0.33	0.15	0.01	0.82
$t_s =$		votes/capita	0.28	0.15	0.01	0.50
$f_c(0) =$	+	marginal voter density	0.17	0.11	0	0.72
	+	share partisans	0.64	0.23	0	1
$a_c =$	+	unempl. 1930	0.01	0.01	0	0.06
	+	unempl. 1937	0.04	0.02	0	0.14
	−	retail wage	1161	180	500	1804
	−	crop value/capita	138	115	0	805
	−	bank deposits/capita	130	181	0	5345
	−	%Δbank deposits/capita	-0.25	0.52	-1	11.61
	−	median dwell. value	2694	1360	536	20000
	−	farm value/capita	210	154	0	849
	+	median rent	1540	668	536	5204
	−	share 21^+	0.56	0.06	0.37	0.75
	+	share 65^+	0.02	0.04	0	0.09
	+	share female	0.48	0.02	0.34	0.53
	+	share African American	0.07	0.14	0	0.86
	+	share immigrants	0.06	0.06	0	0.39
controls		gas sales/capita	11	8	0	137
		share urban	0.23	0.25	0	1
		population density	1361	18578	2	848778
		population size.	44178	140540	1736	4014611

that the main role of media in politics is to affect *policy*. The media changes the political benefits to promote different policies. At the same time, voters are

not misinformed in average, so the group of informed and uninformed voters

While mass media may have

Large effects on policy are

that the findings that mass media has minimal effects on voting intentions is no reason to believe that

that the main role of media in politics is to affect *policy*, whereas its role in affecting voting decisions and public opinion is only minor. The reason is that the media changes the political benefits to promote different policies. At the same time, voters are not misinformed in average, so the group of informed and uninformed voters

affects

The reason is that the media changes the political benefits to promote different policies.

the simultaneous response of political parties to media coverage tends to mitigate the effects on voting intentions, while policies change considerably. Guided by this work, this paper looks for mass media effects on policy, and indeed finds large such effects. finds the main effects of mass media may lie in the field of policya possible way to förena compatible explanation for the seeming contradiction between conventional wisdom and research findings: mass media may well have significant effects on *policy* without changing voting intentions or public opinioin. The simultaneous response of political parties to media coverage may keep voting intentions and relatively constant, while policies change considerably. Guided by this work, this paper looks for mass media effects on policy, and indeed finds large such effects.

In a theoretical analysis, Strömberg (1999) argues that mass media has performed poorly because it has been cast in the wrong role: the main role of media in politics is to affect *policy*, whereas its role in affecting voting decisions is likely to be minor. The reason is that the media may change the efficiency with which political parties can reach different groups with campaign promises, and thus the benefits to promote favorable policies to these groups. At the same time, the simultaneous response of political parties to media coverage may keep voting intentions relatively constant. Guided by these ideas, this paper looks for mass media effects on policy.

Appendix 2: Definitions of Variables

FERA spending/capita:	Cumulative disbursement within the FERA program April 1933 to December 1935/(0.6*population size 1930 + 0.4*population size 1940).
r_c, share hhlds with radios:	families reporting radio sets/total number of families 1930.
share illiterate:	number of persons ten years of age and over who are illiterate 1930/population 1930.
school enrollment:	number of persons 7-18 years of age attending school/ number of persons of age 7-18.
t_c, votes/capita:	total votes cast in Gubernatorial elections 1933-1936/((election year-1930)*population 1940 + (1940-election year)*population 1930)/10.
votes/capita in Pres. elect.:	total votes cast in Presidential elections 1932/ (0.2* population 1940 + 0.8*population 1930).
marginal voter density:	see explanation in specification section.
share partisans:	share of voters who voted for the winning gubernatorial candidate.
unempl. 1930:	total number of persons out of a job, able to work, and looking for a job 1930/population 1930.
unempl. 1937:	number of totally unemployed persons registered 1937/ (0.3*population 1930+0.7*population 1940).
retail wage:	total full time and part-time payroll of retail establishments 1930/number of full-time employees of retail distribution stores 1930.
crop value/capita:	total value of all crops harvested 1929/population 1930.
bank deposits/capita:	bank deposits 1934/(0.6*population size 1930 + 0.4*population size 1940).
%Δbank deposits/capita:	(bank deposits/capita 1934 - bank deposits per capita 1930)/(bank deposits/capita 1930).
median dwell.value:	median value of owner-occupied dwelling units, 1930.
farm value/capita:	value of farm buildings 1930/population 1930.
median rent:	median monthly contract rent of tenant-occupied dwelling units, 1930.
share 21+:	number of persons 21 years of age or older/population 1930.
share 65+:	number of persons 65 years of age or older/population 1930.
share female:	number of females/population 1930.
share black:	number of African Americans/population 1930.
share immigrants:	number of foreign born white persons / number of white persons 1930.
share urban:	total urban population/population 1930.
gas sales/capita:	sales of filling stations in 1934/(0.6*population size 1930 + 0.4*population size 1940).
pop. density:	population per square mile 1930.
population:	0.6*population 1930 + 0.4*population 1940.
vote margin	(votes of winner - votes of runner up)/total votes in gubernatorial election
vote margin at state level	same as vote margin, but all vote data aggregated to state level.

Table 1. Summary statistics

Theoretical variables		Empirical variables	Mean	St. Dev.	Min.	Max.
z_c =		FERA spending/capita	19.98	15.32	0.04	225.67
z_s =		FERA spending/capita$_s$	25.72	11.39	9.50	57.14
σ_c =	+	share hhlds with radios	0.26	0.18	0.01	0.90
	-	share illiterate	0.04	0.04	0.00	0.44
	+	school enrollment	0.74	0.06	0.05	1.00
t_c =	+	votes/capita	0.30	0.17	0.00	0.82
t_s =		votes/capita$_s$	0.28	0.15	0.01	0.50
$f(0)_c$ =	+	marginal voter density	0.22	0.17	0.00	1.03
	+	share partisans	0.64	0.23	0.00	1.00
a_c =	+	unempl. 1930	0.01	0.01	0.00	0.09
	+	unempl. 1937	0.04	0.02	0.00	0.14
	-	retail wage	1130	205	0	2800
	-	crop value/capita	137	117	0	1272
	-	bank deposits/ capita	115	169	0	5345
	-	%Δbank deposits/capita	-0.25	0.52	-1.00	11.61
	-	median dwell.value	2582	1357	536	20000
	-	farm value/capita	189	148	0	849
	+	median rent	1444	683	429	5204
	-	share 21+	0.55	0.06	0.36	0.83
	+	share 65+	0.04	0.02	0.00	0.09
	+	share female	0.48	0.02	0.23	0.54
	+	share black	0.11	0.18	0.00	0.86
	+	share immigrants	0.05	0.06	0.00	0.50
controls		share urban	0.21	0.26	0.00	1.00
		gas sales/capita	10	8	0	122
		pop. density	1846	19341	1	848778
		population	40609	138268	48	4014611

Table 2. Dependent variable: log *FERA spending/capita*

A	B		I	II	III	IV	V	VI	VII	VIII
		state effects	no	no	no	yes	yes	yes	yes	yes
		IV	no	yes	no	no	yes	no	no	no
σ_c	+	**c_1: share hhlds with radios**	**0.603**** **(3.3)**	**0.616**** **(3.4)**	**0.593**** **(3.2)**	**0.474*** **(2.3)**	**0.490*** **(2.4)**	**0.532**** **(2.6)**	**0.469*** **(2.5)**	**0.237** **(1.2)**
	+	**radios*rural**								**0.568**** **(4.5)**
	-	share illiterate	-1.777** (-3.6)	-1.817** (-3.7)	-2.085** (-4.2)	-1.386** (-2.7)	-1.369** (-2.7)	-1.671** (-3.2)	-1.705** (-3.6)	-1.264* (-2.4)
	+	school enrollment	0.458 (1.5)	0.475 (1.5)	0.502 (1.6)	0.741* (2.3)	0.756* (2.4)	0.821** (2.6)	0.590 (1.9)	0.788* (2.5)
t_c	+	**c_2: log(t_c/t_s)**	**0.209**** **(6.2)**	**0.169**** **(3.6)**		**0.183**** **(5.1)**	**0.179**** **(2.9)**		**0.206**** **(5.9)**	**0.186**** **(5.2)**
$f(0)_c$	+	marginal voter density	0.275** (3.7)	0.277** (3.7)	0.253** (3.4)	0.188 (1.4)	0.194 (1.4)	0.128 (0.9)	0.183 (1.5)	0.198 (1.5)
	+	share partisans	0.212** (3.1)	0.212** (3.1)	0.228** (3.3)	0.077 (0.6)	0.074 (0.6)	0.009 (0.1)	0.122 (1.1)	0.044 (0.4)
a_c	+	unempl. 1930	8.375** (4.9)	8.201** (4.9)	8.711** (5.2)	8.617** (5.0)	8.431** (4.9)	8.594** (5.0)	7.464** (4.3)	8.046** (4.6)
	+	unempl. 1937	8.971** (12.6)	9.042** (12.6)	8.945** (12.5)	9.875** (12.8)	9.932** (12.9)	10.07** (13.0)	9.680** (13.5)	9.855** (13.0)
	-	log retail wage	-0.096 (-1.1)	-0.101 (-1.1)	-0.108 (-1.2)	-0.061 (-0.7)	-0.060 (-0.7)	-0.089 (-1.0)	-0.132 (-1.8)	-0.045 (-0.5)
	-	log crop value/capita	-0.010 (-0.4)	-0.012 (-0.5)	-0.018 (-0.8)	0.024 (1.0)	0.024 (1.0)	0.018 (0.7)	0.002 (0.1)	0.024 (1.0)
	-	log bank deposits/ capita	-0.077** (-4.9)	-0.078** (-5.0)	-0.082** (-5.2)	-0.093** (-5.4)	-0.093** (-5.5)	-0.093** (-5.3)	-0.079** (-4.8)	-0.100** (-5.8)
	-	%Δbank deposits/capita	-0.009 (-0.7)	-0.008 (-0.6)	0.001 (0.1)	-0.013 (-1.0)	-0.013 (-1.1)	-0.008 (-0.6)	-0.019 (-1.5)	-0.009 (-0.7)
	-	log median dwell.value	-0.039 (-1.0)	-0.035 (-0.9)	-0.008 (-0.2)	0.000 (0.0)	0.000 (0.0)	0.007 (0.2)	0.000 (0.0)	-0.017 (-0.4)
	-	log farm value/capita	-0.147** (-4.2)	-0.150** (-4.3)	-0.155** (-4.4)	-0.175** (-4.6)	-0.176** (-4.8)	-0.174** (-4.6)	-0.148** (-4.3)	-0.154** (-4.1)
	+	log median rent	0.048 (0.9)	0.039 (0.7)	0.007 (0.1)	-0.047 (-0.8)	-0.053 (-0.9)	-0.068 (-1.1)		-0.029 (-0.5)
	-	share 21+	-2.140** (-4.9)	-2.150** (-4.9)	-2.076** (-4.7)	-0.867 (-1.6)	-0.867 (-1.6)	-0.755 (-1.4)	-1.137* (-2.2)	-1.406** (-2.6)
	+	share 65+	-4.144* (-2.5)	-4.037* (-2.4)	-3.802* (-2.3)	-4.745* (-2.4)	-4.795* (-2.4)	-4.342* (-2.2)	-4.851** (-2.6)	-2.973 (-1.5)
	+	share female	5.631** (5.6)	5.713** (5.6)	6.072** (5.9)	3.046** (2.6)	3.002** (2.6)	3.153** (2.7)	2.440* (2.2)	2.359* (2.0)
	+	share black	0.002 (0.0)	-0.030 (-0.3)	-0.183 (-1.8)	0.051 (0.4)	0.053 (0.4)	-0.162 (-1.5)	0.129 (1.2)	0.091 (0.8)
	+	share immigrants	0.197 (0.7)	0.197 (0.7)	0.249 (0.8)	0.577 (1.5)	0.558 (1.5)	0.633 (1.6)	0.444 (1.2)	0.435 (1.1)
con-trol		share urban	0.545 (5.3)	0.540 (5.2)	0.520** (5.0)	0.544 (5.2)	0.542 (5.3)	0.533** (5.0)	0.561** (6.1)	0.879** (7.4)
		log gas sales/capita	0.010 (0.6)	0.012 (0.7)	0.012 (0.7)	0.019 (1.1)	0.020 (1.1)	0.018 (1.0)		0.014 (0.8)
		log pop. density	-0.024 (-1.2)	-0.023 (-1.1)	-0.025 (-1.2)	-0.072** (-2.7)	-0.072** (-2.7)	-0.074** (-2.7)	-0.083** (-3.4)	-0.075** (-2.8)
		log population	-0.184** (-7.1)	-0.187** (-7.1)	-0.201** (-7.7)	-0.116** (-4.2)	-0.115** (-4.1)	-0.131** (-4.7)	-0.118** (-4.6)	-0.095** (-3.4)
z_s	+	log FERA spending/capitas	0.952** (25.6)	0.950** (25.6)	0.944** (25.4)					
		C	0.894 (1.0)	0.962 (1.0)	1.064 (1.1)	3.749** (3.9)	3.782** (4.0)	4.070** (4.2)	4.512** (5.5)	3.861** (4.1)
		R2	0.57	0.57	0.57	0.62	0.62	0.62	0.62	0.63
		# observations	2496	2481	2496	2496	2481	2496	2759	2496

Standard errors are heteroscedastic consistent. T-statistics in parenthesis. * Significant at 1 percent level. ** Significant at 5 percent level.

Table 3. Excluding elections with winning margins > 30%. Dependent variable: log *FERA spending/capita*

A	B		I	II	III	IV	V	VI	VII	VIII
		state effects	no	no	no	yes	yes	yes	yes	yes
		IV	no	yes	no	no	yes	no	yes	no
σ_c	+	**c_1:share hhlds with radios**	**0.720**** **(3.4)**	**0.744**** **(3.5)**	**0.772**** **(3.6)**	**0.729**** **(3.2)**	**0.773**** **(3.5)**	**0.831**** **(3.7)**	**0.658**** **(3.3)**	**0.529*** **(2.3)**
	+	**radios*rural**								**0.571**** **(4.2)**
	-	share illiterate	-2.012** (-2.7)	-2.052** (-2.8)	-2.192** (-2.9)	-2.516* (-2.5)	-2.666** (-2.8)	-3.026** (-3.2)	-2.772** (-3.5)	-2.091* (-2.2)
	+	school enrollment	0.566 (1.3)	0.618 (1.4)	0.812 (1.8)	0.822 (1.7)	0.885 (1.9)	1.002* (2.1)	0.475 (1.0)	0.846 (1.8)
t_c	+	**c_2: log(votes/capita$_c$/ votes/capita$_s$)**	**0.511**** **(5.8)**	**0.415**** **(3.9)**		**0.447**** **(4.6)**	**0.306*** **(2.5)**		**0.465**** **(5.2)**	**0.430**** **(4.5)**
$f(0)_c$	+	marginal voter density	0.520** (4.1)	0.516** (4.1)	0.434** (3.4)	0.237 (1.3)	0.227 (1.2)	0.140 (0.7)	0.255 (1.5)	0.269 (1.4)
	+	share partisans	0.399** (3.8)	0.381** (3.6)	0.305** (2.9)	0.257 (1.7)	0.224 (1.5)	0.145 (1.0)	0.278* (1.9)	0.218 (1.4)
a_c	+	unempl. 1930	8.004** (3.7)	7.934** (3.7)	8.989** (4.2)	9.408** (4.2)	9.328** (4.3)	9.490** (4.2)	7.372** (3.3)	8.817** (4.0)
	+	unempl. 1937	9.336** (9.8)	9.349** (9.9)	9.505** (9.8)	10.01** (9.1)	10.05** (9.3)	10.62** (9.6)	9.627** (9.6)	9.853** (9.0)
	-	log retail wage	-0.219 (-1.9)	-0.217 (-1.9)	-0.223 (-1.9)	-0.184 (-1.5)	-0.183 (-1.5)	-0.212 (-1.7)	-0.143 (-1.4)	-0.180 (-1.5)
	-	log crop value/capita	0.009 (0.3)	0.005 (0.2)	-0.009 (-0.3)	0.086** (2.6)	0.080* (2.5)	0.074* (2.2)	0.063* (2.1)	0.090** (2.8)
	-	log bank deposits/ capita	-0.069** (-2.7)	-0.068** (-2.6)	-0.051* (-2.0)	-0.117** (-4.2)	-0.114** (-4.2)	-0.104** (-3.8)	-0.119** (-4.7)	-0.120** (-4.3)
	-	%Δbank deposits/capita	-0.117* (-2.5)	-0.121** (-2.7)	-0.137** (-3.0)	-0.133** (-2.7)	-0.137** (-3.0)	-0.139** (-3.1)	-0.088* (-2.1)	-0.118* (-2.4)
	-	log median dwell.value	-0.034 (-0.6)	-0.039 (-0.7)	-0.049 (-0.9)	-0.044 (-0.7)	-0.044 (-0.7)	-0.040 (-0.6)		-0.060 (-1.0)
	-	log farm value/capita	-0.210** (-5.0)	-0.212** (-5.1)	-0.202** (-4.7)	-0.284** (-6.4)	-0.285** (-6.6)	-0.280** (-6.3)	-0.266** (-6.3)	-0.263** (-5.9)
	+	log median rent	0.042 (0.6)	0.036 (0.5)	0.009 (0.1)	0.017 (0.2)	-0.004 (0.0)	-0.035 (-0.4)		0.019 (0.2)
	-	share 21+	-2.290** (-4.0)	-2.329** (-4.1)	-2.229** (-3.8)	-1.254 (-1.7)	-1.129 (-1.5)	-0.786 (-1.0)	-1.351* (-2.0)	-1.837* (-2.4)
	+	share 65+	-4.437* (-2.2)	-4.139* (-2.1)	-3.584 (-1.8)	-4.425 (-1.8)	-4.364 (-1.8)	-4.223 (-1.6)	-4.369 (-1.9)	-2.211 (-0.9)
	+	share female	4.753** (3.9)	4.856** (4.0)	5.163** (4.2)	2.219 (1.5)	2.364 (1.7)	2.734 (1.9)	2.013 (1.5)	1.449 (1.0)
	+	share black	-0.705** (-2.7)	-0.695** (-2.7)	-0.666* (-2.4)	-0.437 (-1.3)	-0.461 (-1.4)	-0.527 (-1.5)	-0.393 (-1.3)	-0.456 (-1.4)
	+	share immigrants	-0.180 (-0.6)	-0.173 (-0.6)	-0.087 (-0.3)	0.128 (0.3)	0.119 (0.3)	0.208 (0.5)	0.034 (0.1)	-0.008 (0.0)
con-trols		share urban	0.454 (4.2)	0.441 (4.1)	0.410** (3.7)	0.484 (4.3)	0.472 (4.3)	0.458** (4.0)	0.500** (5.0)	0.887** (6.5)
		log gas sales/capita	-0.010 (-0.4)	-0.006 (-0.2)	-0.001 (-0.1)	0.005 (0.2)	0.006 (0.3)	0.008 (0.3)		-0.001 (0.0)
		log pop. density	-0.040 (-1.6)	-0.035 (-1.4)	-0.025 (-1.0)	-0.083** (-2.6)	-0.085** (-2.7)	-0.085** (-2.6)	-0.098 (-3.3)	-0.093** (-2.9)
		log population	-0.116** (-3.6)	-0.124** (-3.9)	-0.163** (-5.2)	-0.054 (-1.6)	-0.065 (-2.0)	-0.093** (-2.8)	-0.050 (-1.6)	-0.028 (-0.8)
z_s	+	log FERA spending/capitas	0.870** (19.5)	0.871** (19.6)	0.886** (19.8)					
		C	1.973 (1.7)	2.040 (1.8)	2.230 (1.9)	4.659** (3.7)	4.743** (3.8)	4.887** (3.8)	4.745** (4.3)	4.979** (3.9)
		R2	0.53	0.53	0.52	0.58	0.58	0.57	0.57	0.58
		# observations	1752	1748	1752	1752	1748	1752	1940	1752

Standard errors are heteroscedastic consistent. T-statistics in parenthesis. * Significant at 1 percent level. ** Significant at 5 percent level.

Table 4. Dependent variable: *votes/capita*

	I	II
elections with winning margins>30% excluded	no	yes
state effects	yes	yes
share hhlds (b_1) with radios	**0.068** **(4.2)**	**0.094** **(4.9)**
share illiterate	-0.073 (-1.4)	-0.332** (-3.2)
school enrollment	0.075** (2.6)	0.170** (3.8)
marginal voter density	-0.079** (-7.4)	-0.078** (-5.4)
share partisans	-0.091** (-7.8)	-0.058** (-4.3)
unempl. 1930	0.115 (0.6)	0.046 (0.2)
unempl. 1937	0.233** (3.4)	0.427** (4.3)
log retail wage	-0.020* (-2.0)	-0.031* (-2.2)
log crop value/capita	-0.002 (-0.9)	-0.009** (-2.8)
log bank deposits/ capita	0.004** (2.7)	0.011** (4.4)
%Δbank deposits/capita	0.004* (2.3)	-0.005 (-0.8)
log median dwell.value	0.009* (2.2)	0.002 (0.3)
log farm value/capita	-0.002 (-0.7)	0.000 (-0.1)
log median rent	-0.034** (-5.3)	-0.034** (-3.6)
share 21+	0.430** (8.0)	0.420** (5.6)
share 65+	0.390* (2.2)	0.191 (0.8)
share female	0.285** (2.8)	0.469** (3.8)
share black	-0.102** (-10.5)	0.034 (1.3)
share immigrants	0.052 (1.6)	0.060 (1.7)
share urban	-0.036** (-4.5)	-0.038** (-3.9)
log gas sales/capita	0.000 (0.2)	0.001 (0.4)
log pop. density	-0.004 (-1.8)	-0.004 (-1.7)
log population	-0.022** (-9.4)	-0.031** (-10.6)
C	0.557** (6.6)	0.438** (4.1)
R2	0.94	0.85
Number of observations	2525	1756

Standard errors are heteroscedastic consistent. T-statistics in parenthesis.
*Denotes significance at 1 percent level. **Denotes significance at 5 percent level.

Table 5. Dependent variable: *votes per capita* 1920-1940.
Fixed effects regressions

	I	II	III	IV	V	VI	VII
election year effects	no	no	no	yes	yes	yes	yes
time period	1920-1940	1920-1930	1930-1940	1920-1940	1920-1930	1920-1930	1930-1940
share hhlds (b_1) with radios	**0.092**** **(14.5)**	**0.110**** **(8.8)**	**0.160**** **(11.2)**	**0.068**** **(7.7)**	**0.114**** **(9.6)**	**0.111**** **(9.5)**	**0.066**** **(3.4)**
radios*rural						**0.036**** **(3.8)**	
share illiterate		-0.317** (-3.4)			0.054 (0.5)	0.035 (0.4)	
school enrollment	0.118** (9.2)	-0.103** (-3.6)	0.086** (3.4)	0.013 (0.7)	-0.064* (-2.2)	-0.063* (-2.2)	0.048 (1.8)
radio*vote margin at state level	-0.163** (-7.9)	-1.259** (-16.9)	-0.095** (-2.7)	-0.058** (-3.0)	-0.865** (-13.1)	-0.889** (-13.4)	-0.110** (-3.5)
vote margin at state level	-0.104** (-7.2)	0.006 (0.3)	-0.095** (-3.4)	-0.132** (-9.7)	-0.032* (-2.0)	-0.028 (-1.7)	-0.061* (-2.5)
vote margin at county level	-0.029** (-5.1)	-0.025** (-3.6)	-0.032** (-4.0)	0.001 (0.2)	-0.003 (-0.5)	-0.004 (-0.6)	-0.005 (-0.7)
share 21+	0.482** (8.9)	0.751** (8.1)	-0.015 (-0.2)	0.153** (2.9)	0.246** (2.9)	0.219* (2.5)	0.123 (1.5)
log retail wage	-0.006 (-1.4)	-0.002 (-0.4)	-0.013* (-2.3)	0.004 (1.0)	0.002 (0.5)	0.002 (0.5)	-0.003 (-0.5)
log crop value/capita	0.006* (2.2)	0.002 (0.4)	0.006 (1.3)	0.006* (2.2)	-0.007 (-1.8)	-0.007* (-2.0)	0.015** (3.6)
share female	0.061 (1.7)	0.961** (6.0)	-0.257** (-4.8)	-0.053 (-1.3)	0.629** (4.5)	0.686** (4.9)	-0.148** (-2.8)
share urban	-0.011 (-0.7)	0.009 (0.4)	-0.040 (-1.4)	-0.010 (-0.7)	0.008 (0.4)	0.002 (0.1)	-0.050* (-2.1)
share black	0.125* (2.4)	-0.053 (-0.7)	0.558** (4.6)	0.032 (0.7)	-0.134* (-2.0)	-0.135* (-2.0)	0.286** (2.7)
share immigrants	-0.026 (-1.2)	-0.005 (-0.2)	-0.903** (-9.7)	-0.131** (-6.4)	-0.164** (-6.7)	-0.158** (-6.5)	-0.238** (-2.8)
log population	-0.039** (-5.7)	-0.031** (-3.4)	-0.101** (-6.0)	-0.057** (-9.6)	-0.061** (-7.8)	-0.057** (-7.2)	-0.049** (-3.4)
R2	0.92	0.94	0.95	0.94	0.96	0.96	0.96
Number of observations	7516	5220	4701	7516	5220	5220	4701

T-statistics in parenthesis. *Denotes significance at 1 percent level. **Denotes significance at 5 percent level.

Table 6. Dependent variable: votes per capita 1920- 1940.

	I	II	III
election year effects	no	no	yes
state effects	no	yes	yes
share of hhlds (b_1) with radios	**0.094** **(15.5)**	**0.075** **(14.0)**	**0.085** **(8.7)**
school enrollment	0.175** (12.1)	0.111** (9.4)	0.058** (3.7)
radio*vote margin at state level	-0.298** (-12.1)	-0.201** (-8.8)	-0.097** (-4.0)
vote margin at state level	-0.127** (-8.8)	-0.058** (-3.7)	-0.080** (-4.8)
vote margin	-0.097** (-15.5)	-0.064** (-12.6)	-0.049** (-9.9)
share 21+	0.672** (27.1)	0.505** (20.2)	0.486** (20.3)
log retail wage	0.001 (0.3)	0.000 (-0.1)	0.002 (0.7)
log crop value/capita	0.009** (7.0)	-0.002 (-1.5)	-0.003* (-2.5)
share female	0.191** (4.4)	0.150** (4.3)	0.152** (3.5)
share urban	-0.049** (-6.8)	-0.058** (-9.7)	-0.059** (-10.2)
share black	-0.218** (-24.2)	-0.109** (-13.5)	-0.112** (-14.4)
share immigrants	0.012 (0.9)	-0.060** (-4.1)	-0.099** (-6.4)
log population	-0.013** (-7.5)	-0.012** (-7.8)	-0.012** (-8.1)
C	-0.182** (-4.0)		
R2	0.67	0.80	0.82
Number of observations			

T-statistics in parenthesis. *Denotes significance at 1 percent level. **Denotes significance at 5 percent level.

Table 7. Dependent variable: log *FERA spending/capita*$_c$

A	B		I	II
		South excluded	no	yes
r_s/r	+	**c_{12}': r_s/r**	**0.507**** **(6.3)**	**0.503**** **(5.0)**
$(v_s/n_s)/(v/n)$	+	**c_{22}': $\log(v_s/n_s)/(v/n)$**	**0.195**** **(2.6)**	**0.009** **(0.1)**
	-	| vote share$_s$-0.5$_s$ |	-1.452** (-7.4)	-1.050** (-3.2)
	-	| vote share$_s$-0.64 |	2.397** (10.0)	2.402** (5.6)
σ_c	+	**c_0': r_c/r_s**	**0.240**** **(4.2)**	**0.387**** **(4.5)**
	-	share illiterate	-1.045 (-1.9)	-0.928 (-1.1)
	+	school enrollment	0.473 (1.5)	0.410 (0.8)
t_c/t_s	+	**c_2: $\log(t_c/t_s)$**	**0.185**** **(4.9)**	**0.607**** **(5.6)**
$f(0)_c$	+	marginal voter density	0.466** (4.9)	1.142** (7.4)
	+	share partisans	-0.405** (-4.0)	-0.222 (-1.8)
a_c	+	unempl. 1930	6.593** (3.9)	6.391** (2.9)
	+	unempl. 1937	11.868** (15.1)	12.324** (11.3)
	-	log retail wage	-0.069 (-0.7)	-0.075 (-0.6)
	-	log crop value/capita	0.008 (0.3)	0.042 (1.4)
	-	log bank deposits/ capita	-0.079** (-4.3)	-0.080** (-2.8)
	-	%Δbank deposits/capita	-0.008 (-0.5)	-0.041 (-0.8)
	-	log median dwell.value	-0.102* (-2.5)	-0.108 (-1.8)
	-	log farm value/capita	-0.154** (-4.0)	-0.263** (-5.9)
	+	log median rent	0.181** (3.0)	0.287** (3.5)
	-	share 21+	-2.115** (-4.4)	-2.337** (-3.6)
	+	share 65+	-5.379** (-2.7)	-4.639** (-2.0)
	+	share female	4.084** (3.7)	3.832** (2.9)
	+	share black	0.250* (2.2)	-0.443 (-1.6)
	+	share immigrants	1.192** (3.5)	0.443 (1.2)
con-trols[†]			- -	- -
		C	6.121** (4.5)	3.051 (1.7)
		R2	0.51	0.46
		# observations	2496	1752

[†]Controls are not reported because of space constraints. T-statistics in parenthesis. [*]Denotes significance at 1 percent level. [**]Denotes significance at 5 percent level.