THE POLITICS OF PUBLIC SPENDING

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Chapter 2

Radio's Impact on New Deal Spending

Knowledge is power.[1]

2.1 Introduction and summary

Many believe that less informed people are politically disadvantaged. This has caused concerns for the knowledge gap between, for example rich and poor, and African American and whites. However, to my knowledge, this belief has not been subject to an empirical test, and the alleged effects have not been measured. This paper attempts to measure the effects of two characteristics strongly related to political knowledge – the use of mass media and illiteracy – on political power measured as the ability to attract redistributive transfers. The results have implications for both redistribution and the growth of the government sector?

The main focus of the paper is on the effects of mass media. Mass media provide the bulk of the information people use in elections. 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

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

"newspapers"[2]. However, 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 changes 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 reach the part of the population with reading difficulties than can newspapers. As a result, during the late 1930s, radio became the main information provider to low-education groups and to rural listeners with less ready access to daily newspapers than people living in cities[3].

That some identifiable groups became better informed due to the radio may not seem surprising in itself, but if knowledge is indeed power, it may have far reaching implications. The expansion of radio could then have paved the way for government policies favoring low-education groups and farmers during the 1930s. Similarly, the subsequent advent of television increased the share of media users among low-education and low-income groups[4], and among African Americans[5], perhaps making way for more favorable policies toward these groups in the 1960s. Looking forward, new innovations, like the internet and global satellite transmissions, could again change government spending in a way that is predictable given the characteristics of these media.

Before proceeding to describe the empirical work, it is important to carefully specify how information from the mass media may affect government spending. This is done in section 2.2, which develops a model based on Strömberg (1998). In this model, information from radio matters both *directly*, and *indirectly* via its effect on voter turnout, see Figure 2-1. The *direct effect* arises because mass media affect how well politicians can make their campaign promises known to the electorate. The idea can be illustrated by an example. If a politician in the early 1920s would have

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[2] Gallup (1940).

[3] Sterling and Kitross (1978).

[4] Bogart (1956).

[5] McCombs (1968).

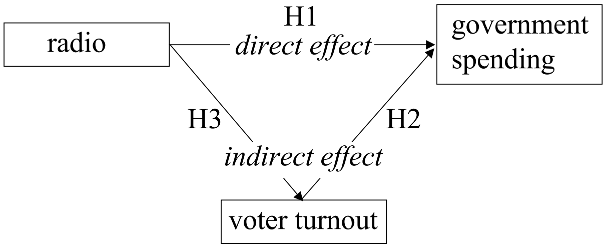

Figure 2-1:

promised to start a farm subsidy program, the return in the form of rural votes might have been meagre. The reason is that many of the concerned people living in rural areas 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 this promise directly to an increasing number of these voters. Thus the introduction of radio could have changed the incentives to make these promises considerably.

A direct effect also arises if voters judge politicians by their past performance in office, since radio provides information about who is responsible for making cuts or increases in government programs. Continuing the previous example, a farm-subsidy program in the early 1920s might have been politically inefficient, since many of the people living in rural areas would not have known what particular politician to give credit for the program. Ten years later, a politician could go on radio and tell an increasing number of these voters directly that the credit was his or hers. This, of course increased the incentive to launch such programs.

The reason for the *indirect effect* is straightforward. Although a politician may increase voter sympathies by promising favorable policies to some group, this will do the 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 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 factors[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. In these communities, people are more likely to vote, and more likely to change their votes if the politician promises higher spending.

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[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

Section 2.2 concludes by formulating the main hypotheses of the direct and indirect effects. These are illustrated in Figure 2-1. The first is hypothesis H1: politicians should allocate more government funds to areas where a larger share of the households have radios, everything else equal. The remaining two hypotheses are the building blocks of the indirect effect via voter turnout. 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 2.3 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 voter turnout. 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. The 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.

Before presenting the empirical results, there will be a short discussion of why it is reasonable to look for effects from radio in the allocation of FERA funds. The FERA program was chosen because of its time of implementation, its size, and its

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institutional on the rules of the political game etc.

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) finds 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).

novelty. If it is true that the expanding use of radios increased the political strength of certain groups or regions, then one should expect a new, major program to be designed to target these groups, to some extent. The 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.

The FERA program was implemented in the middle of radio's expansion period, an ideal time for this type of study. By the start 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 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. For example, Roosevelt made radio addresses during his time as Governor of New York, and later, as President, used this medium in his series of "fireside chats" with the American public[8]. By 1937, 70 percent of the American public reportedly depended on the radio for their daily news[9]. Radio was also considered a credible media: 88 percent of the American public thought that radio news commentators truthfully reported the news[10].

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. Penetration ranged from 63 percent in New Jersey to 5 percent in Mississippi. 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 be exceptionally large during this period.

The analysis focuses on the FERA allocations made by the governors. In its structure, the FERA was not a federal program, but a state and local program in

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[8] For a good discussion of radio's early history, see Stirling and Kitross (1978).

[9] Gallup (1937).

[10] Gallup (1939)

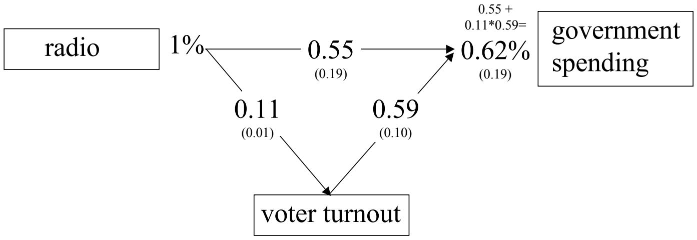

Figure 2-2:

which the federal government cooperated by making grants-in-aid. After a grant was 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 empirical evidence presented in this paper suggests that governors in the 1930s allocated more FERA funds to counties where a larger share of the households had radios, controlling for income, wealth, unemployment, race, education, demographics, etcetera. 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 11 percent, on average. The data support both a direct and an indirect effect via voter turnout.

Figure 2-2 summarizes the main empirical findings. The total effect of an increase of the share of households with radios by one percentage point is an increase in state FERA-spending to the county by 0.62 percent. Of this total effect, 0.55 percent is due to the direct effect and the remaining 0.07 percent to the indirect effect, via voter turnout. The numbers in parenthesis are standard errors[11]. The direct effect is substantially larger and the indirect effect is more statistically significant.

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[11] 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.

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

Finally, it should be pointed out that the above findings do not seem to be just a sign that FERA money went to rich counties, where many happened to have radios and few were illiterate. On the contrary, governors allocated less FERA funds to wealthy counties with high incomes, everything else equal. 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 and wealth, which are in turn negatively related to need for relief funds. Excluding income and wealth from the regression introduces a downward bias in the estimate of the radio coefficient.

Section 2.4 discusses the federal allocation to states. Finally, section 2.5 discusses the results and concludes.

This paper is related to a number of empirical issues, each with its own literature. First, the examination of the political determinants of local public expenditures. For a review see Rubinfeld (1987), and for a recent paper using a model similar to that in this paper, see Case (1998). More closely, the paper relates to a literature on the determinants of New Deal spending; see the seminal work by Wright (1974), and also Wallis (1984), Wallis (1991), and Fleck (1994). Second, the paper is related to the literature on the political effects of mass media; see Lazarsfeld, Berelson and Gaudet (1948), Patterson and McClure (1976), Page, Shapiro and Dempsey (1987), and Iyengar and Kinder (1991). This literature has chiefly been concerned with the effects of mass media on the public's perception of issue salience, on their political knowledge, and on the approval ratings of politicians. Third the paper is related to the vast empirical literature on the determinants of voter turnout; see for example Ashenfelter and Kelley (1975), Nie, Verba, and Petrocik (1976), Wolfinger and Rosenstone (1980), and Teixeira (1992).

2.2 Model

In this section, a model of political competition at the state level is developed. This model produces the hypotheses that will be tested in section 2.3.2.

In each state s, the following sequence of events takes place. First, two gubernatorial candidates simultaneously announce their election platforms. Then, some voters are informed of the candidates' platforms by mass media or other sources. The voters then 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 $u_i\left(z_c\right)$ 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. These preferences are captured by the individual preference parameters d_i and r_i. The utility from the platform of the Democratic candidate is $u_i\left(z_c^d\right) + d_i$ and the utility from the platform of the Republican candidate is $u_i\left(z_c^r\right) + r_i$. The inhabitants in the state choose whether to vote for candidate r, candidate d, or abstain from voting.

2.2.1 Turnout

The objective of this section is to discuss a set of assumptions that suffice to make radio use affect voter turnout within a rational voter framework. In this framework, voters will turn out to vote if their net benefits from doing so are positive. Let the net benefit from voting for individual i be B_i.

Assumption $A1$: B_i is higher for individuals who know the candidates' election platforms.

The interpretation of this assumption depends on how one interprets B_i. If one believes that the main benefit people get from voting is the satisfaction of performing a citizen duty[12], then the interpretation is that the value of performing this duty is higher for voters who knows what the candidates' platforms are. In other words, the citizen duty of voting is the duty to make an informed choice in the election.

If one believes that the main benefit of voting is that one may change the outcome of the election, then information about the candidates' platforms is necessary to make the right choice in case ones vote is decisive. Since the benefits of voting are higher the more likely it is that one makes the right choice, the benefit from voting is higher for better informed voters; see Matsusaka (1993), and Feddersen and Pesendorfer (1997).

An implication of assumption $A1$ is that better informed voters would vote more frequently, since voting is more valuable to them. This implication is supported by micro-level studies by Palfrey and Poole (1987) and Delli Carpini and Keeter (1996).

Aggregated to the county level, this implies that turnout will be higher in counties where a larger share of the population are informed about candidate platforms. Let t_c be the share of citizens in county c who vote. Let σ_c be the share of citizens in county c who knows the candidates' platforms. Given assumption $A1$, t_c is weakly increasing in σ_c. The next step is to connect σ_c to radio use.

Assumption $A2$: The share, σ_c, of the population who are informed about the candidates' platforms is increasing in the share, r_c, of the population that has a radio.

The empirical literature supports the hypothesis that reading newspapers and listening to radio news increases the knowledge of the candidates[13]. If a larger number of people listen to radio news in areas where there are more households with radios, then this result supports Assumption $A2$.

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[12] Riker and Ordeshook (1968)

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

Taken together, assumptions $A1$ and $A2$ lead to the conclusion that turnout is increasing in the share of households with radios. In addition, turnout depends on other variables related to the costs and benefits of voting which will be specified in the empirical section. These variables are collected in the matrix X_2 below. The equation that is estimated in the empirical section is of the form

$$t_c = b_1 r_c + X_2 \beta_2 + \varepsilon_2. \tag{2.1}$$

Hypothesis H3 states that the coefficient b_1 in the above equation is positive. This hypothesis will be tested below.

2.2.2 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 about the equilibrium allocation. For these voters, $\Delta u_i^e = \overline{\Delta u_i}$, that is, a constant that is independent of any promises the candidates might make during the election campaign. 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[14]. 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

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[14] 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.

Democratic candidate equals $\sum_{i\in s} t_i F_i(\Delta u_i^e)$.

The candidates maximize expected votes. The Democratic candidate in state s solves

$$\max_{z_c^d} \sum_{i\in s} t_i \sigma_i F_i\left[\Delta u_i\right] + t_i\left(1-\sigma_i\right) F_i\left[\overline{\Delta u_i}\right], \tag{2.2}$$

subject to the budget constraint

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

The unique solution to this problem is found by evaluating the first order condition of the above maximization problem at the point where both candidates choose the same allocation, $z_c^d = z_c^r$[15]:

$$\sum_{i\in c} \sigma_i t_i f_i(0) u_i'\left(z_c^d\right) = n_c \lambda_s, \tag{2.3}$$

and applying the budget constraint

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

Equation (2.3) 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 over all counties 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 are cheaper.

To understand the equilibrium allocation, study the left-hand side of equation (2.3). 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.

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[15] 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.

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 FERA-money was more valuable to poor unemployed voters than to well-off voters. In the model, these differences are captured by individual-specific utility functions. The functional form $u_i\left(z_c\right) = k - \frac{a_i}{\frac{1}{\alpha}-1}\left(z_c\right)^{-\frac{1}{\alpha}+1}$ is used. This allows the parameter a_i to capture individual sensitivity, and the parameter α to capture a common sensitivity to spending within the program. For the utility function to 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 (2.3) and using the budget constraint yields

$$z_c = \frac{w_c^\alpha}{\frac{1}{n_s}\sum_{i\in s} w_i^\alpha} z_s, \tag{2.4}$$

where z_s is spending per capita in the state, and w_c is defined as

$$w_c = \sigma_c t_c a_c f_c(0)\rho_c$$

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

where $\sigma_c, t_c, f_c(0)$, and a_c denote county averages.

The variable w_c measures how successful a county is in attracting government funds. Counties with higher w_c^α than the state average will receive a larger than average share of the budget. Therefore spending to a county is increasing in $\sigma_c, t_c, f_c(0)$, and a_c, as well as in the interaction term, ρ_c. The latter implies that if two counties are identical in every other aspect, then more money should be given to counties where exactly those people within the county who are sensitive to spending also have high voter turnout, are close to being indifferent between the candidates, and are likely to hear the election promises.

Taking logs

$$\begin{aligned} \ln z_c &= \alpha \ln \sigma_c + \alpha \ln \left(\frac{t_c}{t_s} \right) + \alpha \ln a_c + \alpha \ln f_c(0) + \qquad (2.5) \\ &\quad \alpha \ln \rho_c - \ln \left(\sum_c \frac{n_c}{n_s} \frac{w_c \alpha}{t_s \alpha} \right) + \ln z_s. \qquad (2.6) \end{aligned}$$

The empirical investigation will be based on this equation and equation (2.1), determining voter turnout.

The above equation contains the two remaining central empirical hypotheses. 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, by assumption $A2$, σ_c is increasing in r_c. 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.

2.3 Data and econometric issues

This section contains a discussion of which empirical variables should be used in the estimations, 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.

2.3.1 Specification

Which empirical variables will be used in the estimation of equation (2.5)? Per capita spending within the FERA-program will be used for the variables z_c and z_s, and voter turnout in the gubernatorial elections will be used for t_c and t_s.

The share of the voters who knows the candidates election platforms, σ_c, is potentially observable and measurable. Recent studies use survey data to investigate what share of the population is aware of different political facts. However, there are no such data from the 1930s. Instead, some variables that recent studies have found to be important determinants of political knowledge will be used to capture effects through σ_c, namely use of radio and education (see the discussion of assumption $A2$ for empirical support for the effect of radio on σ_c). The illiteracy rate among people aged above 10, and the school enrollment rate of people aged 7-18 is used to measure education. In sum, the variable σ_c is assumed to be a function of the form

$$\ln \sigma_c = \kappa_1 r_c - \kappa_2 \text{illiteracy}_c + \kappa_3 \text{school enrollment}_c + \varepsilon_{\sigma c}, \tag{2.7}$$

where κ_1, κ_2 and κ_3 are positive constants.

The average sensitivity to spending, a_c, needs to be proxied. To determine what variables the politicians of the time believed to be important for the sensitivity to program funds a_c, a recommendation of the FERA is used. 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.[16] Therefore, a measure of a_c should include income, wealth, and some cost of living measure. 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.

I have found no direct measures of income and wealth at the county level.

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[16] See 'Final Report On the WPA Program, 1935-43', p3.

Instead, variables which are arguably highly correlated with income and wealth are used. The average wage in the retail sector[17] and the per capita value of all crops harvested are used because they are assumed to be highly correlated with income in urban and rural areas. Similarly, 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 is thought to 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 under 21, and the share of the population over 65, is used for measuring the share of youths and dependents. 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. Summing up, the variable a_c is assumed to be a function of the following form:

$$\begin{aligned}\ln a_c = k_1 \text{unemployment}_c - k_2 \text{income}_c - k_3 \text{wealth}_c + k_3 \text{cost of living}_c \\ -k_5 \text{age21}^+{}_c + k_6 \text{age65}^+{}_c + k_7 \text{African American}_c + k_8 \text{immigrant}_c + \varepsilon_{ac},\end{aligned} \tag{2.8}$$

where $k_1, k_2, ..., k_8$ are positive constants.

Finally, to measure the relative number of marginal voters, $f_c(.)$, the difference between the county and the state vote shares of the winning candidate is used.[18] 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 share of the population that is urban, population density, and population size.

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[17] 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.

[18] This specification is derived from a model where politiciancs maximize the probability of winning the election, see the appendix. The specification was used due to a better fit with the data. $f_c(.)$ will be decreasing in this measure if $f_c(.)$ is symmetric and unimodal. This assumption is rather strong, since we have no a priori reason to believe that this distribution has any particular form.

The next step is to specify what variables to include in the regression on voter turnout, equation (2.1). To make a long story short: all of the variables that affect relief spending should be included because they may also affect voter turnout. The closeness of the election, the size of the population, and the distance in percent from equal county vote shares of the two main competitors in the election are included because they may affect the benefit of voting. The other variables are included since they may affect the cost of voting. The share of the population over 21, and immigration are included because of age and residence requirements for voting. The urban share of the population, population density, and unemployment, are included due to potential differences in the cost of going to the election booth. The last is included since the opportunity cost of unemployed may differ from that of employed. The share of African Americans is included because of disenfranchising of this group in the South.[19] Different measures of education are included since more highly educated people may have lower costs of gathering information, and the share of the population over 65 are included since older people have a stock of political knowledge. Finally, the measures of income and wealth presented above are included as control variables.

Except for voter turnout in equation (2.5), 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.

Summary statistics and the correlation matrix of the variables are shown in tables 1 and 2. Per capita spending within the FERA program, z_c, was obtained from the final statistical report of this program.[20] Per capita benefits from the FERA-program at the county level ranged from 12 cents to \$226, with a mean of \$20 and a variance of \$15. The share of the households in the county with a radio receiver was collected by the 1930 Census and reported at the county level. Regionally, receivers were concentrated in the North East, the Mid-Western cities, and in the Far West. At the county level, penetration ranged from 0.6 percent to 78 percent. The mean of this variable is 26 percent and one standard deviation is 18 percent.[21]

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[19] See Wolfinger and Rosenstone (1980), and Ashenfelter and Kelley (1975).

[20] Source: Work Projects Administration, Final Statistical Report of the Federal Emergency Relief Administration, Washington: U.S. Government Printing Office, 1942.

Looking at the simple correlations, per capita relief is positively correlated with the share of households with radios, as well as with voter turnout. Note also the very strong correlation between the share of households with radios and voter turnout.

2.3.2 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.

To clarify the structure of the econometric problem, the equations determining per capita spending z_c, and the share of the population that votes in the gubernatorial election, t_c, are rewritten as follows:

$$\ln(z_c) = c_1 r_c + c_2 \ln\left(\frac{t_c}{t_s}\right) + X_{c1}\beta_1 + \varepsilon_{c1}, \tag{2.9}$$

$$t_c = b_1 r_c + X_{c2}\beta_2 + \varepsilon_{c2}. \tag{2.10}$$

The first equation is equation (2.5), where σ_c and a_c have been substituted out using equations (2.7) and (2.8). The second is equation (2.1). 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.

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[21] Bureau of the Census, Census of the Population, 1930.

Spending

Let us first turn to the estimation of equation (2.9), determining voter turnout. Theory predicts that

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

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[22]. 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.

The results are reported in table 1. With state specific intercepts, the estimate of c_1 is 0.55, and the estimate of c_2 is 0.18; see regression I. Both coefficients are significant at the one percent level.

What are the most likely sources of bias in this estimation? First, there may be a *simultaneity* problem in the estimation of equation (2.9). Spending within the FERA program may have increased voter turnout 1933-36. This would cause voter turnout to be positively correlated with ε_1 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 regression II.

Another possible problem is that the model may not describe the situation very well in states with lop-sided elections. In these states, allocating the budget in order to win the election may be of small importance in comparison to other aspects not treated in this paper. If states with winning margins of more than 30 percent are excluded, namely the Southern states and Washington, the measured effects become somewhat stronger. In this subsample of about 2000 observations, the estimate of c_1 is 0.73, and the estimate of c_2 is 0.40; see regression III in the same table. Both coefficients remain highly significant. Replacing the state specific intercepts by the log state per capita budget, increases the estimates of c_1 and c_2 slightly; see regressions V and VI. As previously, c_2 is significantly larger in the subsample where the South and Washington are excluded.

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[22] Although there is no formal limit to the size of c_1, it is reasonable to expect that it should be lower than 3.5. 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 27 percent to 28 percent of the households having radios implies that spending increases proportionally, that is, an increase by $1/.28 = 3.5$ percent.

Finally, there may be problems due to *measurement errors* in equation (2.9). In particular, 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, it is important to try to reduce the measurement error in income and wealth.

Summing up, the coefficient estimates of c_1 lie in the region $0.54 - 0.56$ within the whole sample and in the range $0.73 - 0.83$ when the South and Washington are excluded. The estimates of c_2 lie in the range $0.18 - 0.23$ for the whole sample and in the range $0.26 - 0.44$ when the South and Washington are excluded. The estimates are significant at the 1 percent level in all specifications, except for the estimate of c_2 in column IV, which is significant at the 5 percent level. Therefore, hypothesis H1 about a direct effect of radios on government spending, and hypothesis H2, that politicians should spend more in areas where voter turnout is high are not rejected by the data.

Voter turnout

Let us turn now to the estimation of equation (2.10), determining voter turnout. Theory predicts that $b_1 > 0$, and it is also reasonable to expect the coefficient to be 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 2. The estimates of b_1 fall within the predicted interval and are significant, both with and without state-specific intercepts. The estimates imply that an increase in the share of households with radios of one percent will increase voter turnout by 0.24 percent in the regression without state-specific intercepts, and 0.08 in the regression with state-specific intercepts; see table 2, regressions I and II. The results are similar when the Southern states and Washington are excluded from the sample.

In this estimation, there may be an important *omitted variable* problem. People who are interested in politics may be both more likely to have a radio and more likely to vote:

$$\begin{aligned} t_{c,t} &= b_1 r_{c,t} + X_{2,t}\beta_2 + \varepsilon_{c2t}, \\ \varepsilon_{c2t} &= \text{political interest}_{ct} + \mu_t, \\ r_{c,t} &= \text{political interest}_{ct} + ... \end{aligned}$$

This would create a spurious correlation between r_c and t_c, causing a positive bias in the estimate of b_1. One way of reducing this potential bias is to look at changes between 1920 and 1930. Since only 0.2 percent of the US. households had radios in 1922, the level in 1930 is a very good approximation of the change between 1920 and 1930. Thus

$$\Delta t_c = b_1 r_{c,1930} + \Delta X_2 \beta_2 + \Delta\text{political interest} + \Delta\mu,$$

where Δ denotes the difference between 1920 and 1930. It is reasonable to assume that the share of households with radios is positively related to the level of political interest, but it is not clear why it should be related to the change in political interest. If political interest is stable, or if the change in political interest and the level of radio use are uncorrelated, then the coefficient estimate of b_1 from a regression based on changes is unbiased. To study time series variation, a panel data set is used that 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 3. Election-year dummy-variables are included in the first three equations, but not in the next three. Within each set of three equations, the first equation presents results for the whole sample period 1920-1940, the second covers the period 1920-1930 and the third covers the period 1930-1940. 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 dummy variables, see column V. The fixed effects estimates are relatively stable over time, as can be seen in the other columns of table 3.

In this larger sample, one may also estimate b_1 based on both time-series and cross-sectional variance. The estimates of the pooled regressions on turnout in the gubernatorial elections are shown in table 4. The estimates of b_1 are 0.11, 0.16 and 0.8, without any dummy variables, with election-year dummy-variables, and with state dummy-variables, respectively.

However, the most relevant estimates of b_1 are those based on changes from 1920 to 1930. These lie in the interval $0.10 - 0.11$. As the other estimates, they are highly significant. The hypothesis H3 that radio use increased voter turnout is not rejected by the data.

Reduced form regression

Another way of looking at the data is to study a reduced-form equation constructed as follows. Make a first order Taylor expansion of log turnout in equation (2.9). Then substitute out voter turnout using equation (2.10). The result is an equation of the form

$$\ln(z_c) = d_{0s} + d_1 r_c + X\beta + \varepsilon_3.$$

This formulation avoids the simultaneity problem between relief spending and voter turnout, causing correlation between errors ε_1 and ε_2. An estimation of the above equation also provides a measure of the total effect of radios, d_1. If the equations have been correctly specified, this total effect should be consistent with the sum of the previously estimated direct and indirect effects:

$$d_1 = \frac{d\ln(z_c)}{dr_c} = \frac{\partial \ln(z_c)}{\partial r_c} + \frac{\partial \ln(z_c)}{\partial \ln(t_c)} \frac{\partial \ln(t_c)}{\partial t_c} \frac{dt_c}{dr} = c_1 + \frac{c_2}{t_c} b_1.$$

Evaluated at the mean of t_c, the sum of the estimated direct and indirect effects is $0.550 + \frac{0.184}{0.31} * 0.11 = .62$. The estimated value of the total effect, d_1, is 0.62; see table 6, regression I. This is clearly consistent with the earlier estimates. The estimate of d_1 is also significantly different from zero. The estimated total effect of an increase in the share of households with radios by one percent is an increase in FERA spending by 0.62 percent. The earlier estimates indicate that of this total effect, 0.55 percent is due to the direct effect and the remaining 0.07 percent to the indirect effect, via voter turnout. Similarly, estimates of d_1 when the South is excluded and when the state specific intercepts are replaced by the log per capita budget are also significant, and consistent with earlier estimates of c_1 and c_2.

2.3.3 Discussion of other results

Some other results in the regression on relief spending deserve to be mentioned, see table 1. 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.

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 these hypotheses, separate regressions (not reported) were run on subsamples of counties. The direct effect of radios on spending was found to be significantly larger in the subsample of counties with only rural households than in the remaining subsample. Radio's impact on voter turnout is also significantly higher – in fact about twice as high – in the subsample of counties with only rural households. The evidence is mixed concerning radio's effect in counties with many illiterates. The direct effect in the subsample of counties with a higher than median share of illiterates is not significantly different from that in the remaining subsample. However, radio's impact on voter turnout is significantly higher in the subsample of counties with many illiterates.

Of the variables related to need, a_c, the most important variable explaining FERA-spending is the share of the population that was unemployed. The income and cost variables always have the expected signs when significant. The share of the population over 21 is negatively and significantly related to FERA-spending as expected. In contrast to what was expected, the share of the population over 65 is negatively, and sometimes significantly, related to FERA expenditure. The share of the population over 65 is a measure of the share of elderly dependents in the population. It was expected to be positively associated with FERA expenditures. The variable that is supposed to capture the sensitivity of voters to marginal increases in spending, $f_c(.)$, is significantly positive in only one of the specifications.

Moreover, some results in the regression of voter turnout are worth mentioning, see tables 2 to 5. 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, about two thirds of this increase was due to the introduction of radio. The estimations are based on time-series variation using year dummy variables, so they are not merely picking up the 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. As is shown by micro-studies, 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.

2.4 Extension: Federal level

The purpose of this section explore whether radio use also affected the federal allocation of grants to states. The section builds on 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. 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 (2.9) determining spending within states:

$$\begin{aligned} \ln(z_c) &= c_0^{'}\frac{r_c}{r_s} + c_2 \ln\left(\frac{t_c}{t_s}\right) + \\ & c_{12}^{'}\frac{r_s}{r} + c_{22}^{'} \ln\left(\frac{v_s/n_s}{v/n}\right) + X_3\beta_3 + \varepsilon. \end{aligned} \tag{2.11}$$

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 direct 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 $0.53/0.4 = 1.\,3$ percent, evaluated at the national average share of households with radios, 0.4. The estimated total effect of radios on spending implies that a one standard-deviation increase in the state share of households with radios would increase per capita spending by 22 percent. 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 also significant, although only at the five percent level when the southern states and Washington are excluded. 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.

2.5 Conclusion and discussion

Mass media affects politics because it carries politically relevant information to the voter: what have the candidates promised and who is responsible for cuts in government programs? This makes voters using mass media more likely to respond to campaign promises and to hold politicians accountable for cuts that hurt them. As a consequence, politicians should target voters using mass media. A second reason for politicians to target these voters is that it is more likely that they will turn out to vote. All in all, the political system creates incentives to spend more government money in areas where a larger share of the population use mass media.

The empirical evidence presented in this paper suggests that this was indeed the case 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 0.6 percent. A one standard-deviation increase in the share of households with radios would increase spending by 11 percent, and a change from the lowest to the highest share of households with radios in the sample would increase spending by 48 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 large. 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 more net redistribution towards the poor.[23] 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.

Another topic deserving discussion is the apparent discrimination against African

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

Americans in this 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. 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 allegedly used in the South[24], and giving these people access to daily mass media.

Although the empirical results clearly show that radio and literacy are positively related to relief spending, the interpretation of the results are not obvious. The information received from radio could also have motivated people to take other political actions than voting, for example lobbying activities as in Lohmann (1994). It could also be the case that radio made people aware of government programs from which they were entitled to receive funds. Further research may make it possible to distinguish between these different ways of influence.

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

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2.6 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 office, and to hold politicians accountable for making cuts or increases in these programs. This increases the politicians' incentives to target these voters. The importance of voters making the connection between programs and offices has been discussed at length by Popkin (1991). This model draws out the implications of the reasoning of Popkin (1991) with regard to the allocation of government funds and mass media.

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 $u_i\left(z_c\right)$ 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 variables that he can control[25]. 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 $\sum_{i \in s} t_i \sigma_i F_i(\Delta u_i) + t_i \left(1 - \sigma_i\right) F_i(0)$.

The candidates maximize expected votes

$$\max_{z_c^d} \sum_{i \in s} t_i \sigma_i F_i(\Delta u_i) + t_i \left(1 - \sigma_i\right) F_i(0), \tag{2.12}$$

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:

$$\sum_{i \in c} \sigma_i t_i f_i(\Delta u_i) u_i' \left(z_c^{d*} \right) = n_c \lambda_s \tag{2.13}$$

and the budget constraint

$$\sum n_c z_c = I_s.$$

The equilibrium has the same form as equation (2.3), the only difference is that

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

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 (2.3), characterizing allocation in the model of section 2. In this formulation, spending has no equilibrium effect on votes. The reason is that politically powerful 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.

2.7 Appendix 2: Data description

The sources of data are the following. County data on families with radios was collected from the 1930 and 1940 US Censuses. County data on spending within the

FERA program was collected from the *Work Projects Administration, Final Statistical Report of the Federal Emergency Relief Administration*, Washington: US. Government Printing Office, 1942). County data on voter turnout in gubernatorial[26] and presidential[27] elections was collected from the ICPSR archives. Other variables have been collected from different US Censuses.

In some areas, voter turnout was 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 observations are included in the regressions.

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

[27] 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.

Table 2.1. Dependent variable: log per capita spending within the FERA program.

			I	II	III	IV	V	VI
		State dummy vars.	yes	yes	yes	yes	no	no
		IV	no	yes	no	yes	no	no
		South excluded	no	no	yes	yes	no	yes
σ	+	**c_1: share hhlds with radios**	**0.550^{**}**	**$0.546^{*'}$**	**0.728^{**}**	**0.752^{**}**	**0.559^{**}**	**0.828^{**}**
			(2.9)	**(2.8)**	**(3.3)**	**(3.5)**	**(3.3)**	**(4.1)**
	+	**c_2: log(votes per capita/state mean)**	**0.184^{**}**	**0.202^{**}**	**0.405^{**}**	**0.264^{*}**	**0.230^{**}**	**0.443^{**}**
			(5.9)	**(3.7)**	**(4.8)**	**(2.1)**	**(7.2)**	**(5.9)**
σ	+	share in school	0.760^{*}	0.776^{*}	0.744	0.761	0.828^{**}	0.279
			(2.6)	(2.5)	(1.6)	(1.7)	(3.1)	(0.6)
σ	-	share illiterate	-1.497^{*}	-1.451^{**}	-3.411^{**}	-3.455^{**}	-1.162^{**}	-3.691^{**}
			(-3.1)	(-2.9)	(-4.1)	(-4.2)	(-2.6)	(-5.5)
ac	+	unempl. 1930	7.600^{**}	7.128^{**}	7.290^{**}	7.219^{**}	5.783^{**}	5.409^{*}
			(4.3)	(4.0)	(3.1)	(3.2)	(3.3)	(2.5)
ac	+	unempl. 1937	10.201^{**}	10.369^{**}	10.665^{**}	10.873^{**}	10.392^{**}	9.994^{**}
			(14.4)	(14.1)	(10.1)	(10.2)	(16.2)	(11.1)
ac	-	retail wage	-0.228^{**}	-0.210^{*}	-0.292^{**}	-0.288^{**}	-0.192^{*}	-0.381^{**}
			(-3.0)	(-2.6)	(-2.6)	(-2.6)	(-2.5)	(-3.7)
ac	-	crop value/capita	0.009	0.009	0.050	0.045	-0.018	0.005
			(0.4)	(0.4)	(1.7)	(1.5)	(-0.9)	(0.2)
ac	-	median dwell.value	-0.028	-0.033	-0.087	-0.082	-0.105^{**}	-0.135^{**}
			(-0.7)	(-0.8)	(-1.5)	(-1.4)	(-2.9)	(-2.6)
ac	-	value of farm buildings	-0.160^{**}	-0.151^{**}	-0.247^{**}	-0.243^{**}	-0.108^{**}	-0.189^{**}
			(-4.4)	(-4.2)	(-5.8)	(-5.8)	(-3.4)	(-4.8)
ac	+	median rent	0.005	0.003	0.072	0.055	0.192^{**}	0.146^{*}
			(0.1)	(0.1)	(0.9)	(0.7)	(3.4)	(2.0)
ac	-	share 21+	-1.735^{**}	-1.869^{**}	-2.277^{**}	-2.125^{**}	-3.195^{**}	-3.788^{**}
			(-3.6)	(-3.8)	(-3.3)	(-3.1)	(-8.2)	(-7.7)
ac	+	share 65+	-3.333^{*}	-3.307	-3.358	-3.114	-2.473	-2.333
			(-2.0)	(-1.9)	(-1.5)	(-1.4)	(-1.7)	(-1.3)
ac	+	share black	0.168	0.158	-0.211	-0.263	0.054	-0.442
			(1.9)	(1.3)	(-0.7)	(-0.9)	(0.7)	(-1.8)
ac	+	share immigrants	0.288	0.328	0.054	0.037	-0.355	-0.138
			(0.8)	(0.9)	(0.1)	(0.1)	(-1.4)	(-0.5)
fc	-	Gub. vote margin	-0.136	-0.335	-0.182	-0.375	-0.387^{*}	-0.269
			(-0.8)	(-0.9)	(-0.8)	(-0.7)	(-2.5)	(-1.2)
		share urban	0.522^{*}	0.541^{**}	0.407^{**}	0.398^{**}	0.578^{**}	0.513^{**}
			(5.7)	(5.8)	(3.9)	(3.9)	(6.2)	(5.3)
		pop. density	-0.065^{**}	-0.069^{**}	-0.081^{**}	-0.085^{**}	-0.020	-0.022
			(-2.8)	(-2.9)	(-3.0)	(-3.1)	(-1.1)	(-1.1)
		population	-0.099^{**}	-0.092^{**}	-0.029	-0.037	-0.124^{**}	-0.091^{**}
			(-3.9)	(-3.5)	(-0.9)	(-1.2)	(-5.2)	(-3.1)
	+	log(FERA budget per capita in state)					0.876^{**} (23.3)	0.814^{**} (18.0)
		C	6.199^{**}	6.094^{**}	6.480^{**}	6.514^{**}	3.309^{**}	6.163^{**}
			(8.6)	(8.1)	(6.3)	(6.4)	(5.1)	(7.1)
		R2	0.62	0.61	0.56	0.56	0.55	0.50
		Number of observations	2879		1925	1913	2879	1925

Standard errors are heteroscedastic consistent. T-statistics in parenthesis.

[*]Denotes significance at 1 percent level. [**]Denotes significance at 5 percent level.

Table 2.2. Dependent variable: votes per capita.

	I	II	III	IV
State dummies	no	no	yes	yes
South excluded	no	yes	no	yes
b_1: share of hhlds with radios	**0.243****	**0.250****	**0.078****	**0.095****
	(13.1)	**(10.7)**	**(5.0)**	**(5.1)**
vote margin at state level	-0.179**	-0.078**		
	(-21.4)	(-2.7)		
vote margin	-0.091**	-0.073**	-0.089**	-0.066**
	(-10.5)	(-6.0)	(-12.3)	(-6.8)
unempl. 1930	0.252	0.268	0.178	0.095
	(1.1)	(1.0)	(0.9)	(0.4)
unempl. 1937	0.595**	0.628**	0.239**	0.402**
	(7.0)	(5.1)	(3.6)	(4.3)
retail retail wage	-0.018	-0.031	-0.021*	-0.031*
	(-1.5)	(-1.8)	(-2.4)	(-2.5)
crop value/capita	0.005*	0.003	-0.002	-0.006*
	(2.1)	(0.9)	(-1.1)	(-2.0)
median dwell. value	0.008	-0.003	0.013**	0.009
	(1.7)	(-0.4)	(3.4)	(1.4)
value of farm buildings	-0.012**	-0.015**	-0.005	-0.003
	(-3.3)	(-3.3)	(-1.6)	(-0.9)
median rent	-0.003	0.012	-0.032**	-0.032**
	(-0.4)	(1.1)	(-5.3)	(-3.7)
school	-0.089**	0.021	0.040	0.148**
	(-2.7)	(0.4)	(1.5)	(3.6)
share illiterate	-0.223**	-0.579**	-0.096*	-0.372**
	(-4.0)	(-5.7)	(-1.9)	(-4.0)
share black	-0.098**	-0.086*	-0.073**	0.033
	(-8.7)	(-2.3)	(-8.0)	(1.3)
share immigrants	-0.095**	-0.045	-0.033	-0.016
	(-3.6)	(-1.4)	(-1.1)	(-0.5)
share urban	-0.041**	-0.045**	-0.030**	-0.024*
	(-4.5)	(-3.9)	(-4.1)	(-2.5)
pop. density	-0.007**	-0.005	-0.003	-0.003
	(-2.8)	(-1.7)	(-1.5)	(-1.2)
population	-0.029**	-0.036**	-0.022**	-0.028**
	(-9.6)	(-9.8)	(-9.6)	(-9.4)
share 21+	0.179**	0.230**	0.350**	0.357**
	(3.4)	(3.3)	(6.8)	(5.1)
share 65+	1.227**	1.067**	0.803**	0.757**
	(6.4)	(4.3)	(4.8)	(3.4)
1933	-0.198**	0.000		
	(-34.2)	(0.0)		
1934	-0.101**	-0.120**		
	(-31.9)	(-26.6)		
1935†	-0.032**	-0.005		
	(-6.9)	(-0.7)		
C	0.765**	0.824**	0.676**	0.597**
	(9.1)	(7.0)	(9.4)	(6.4)
R2	0.87	0.63	0.94	0.84
Number of observations	2775	1929	2775	1929

† 1936 is excluded. Standard errors are heteroscedastic consistent. T-statistics in parenthesis.
* Denotes significance at 1 percent level. ** Denotes significance at 5 percent level.

Table 2.3.

Dependent variable: votes per capita in gubernatorial elections 1920-1940.
Fixed effects regressions

	I	II	III	IV	V	VI
election year dummies	no	no	no	yes	yes	yes
time period	1920-1940	1920-1930	1930-1940	1920-1940	1920-1930	1930-1940
b_1:hhlds with radios	**0.095****	**0.105****	**0.121****	**0.069****	**0.107****	**0.066****
	(15.6)	**(8.4)**	**(9.9)**	**(7.9)**	**(9.0)**	**(3.4)**
share 21+	0.498**	0.587**	-0.035	0.156**	0.110	0.136
	(9.2)	(6.5)	(-0.4)	(3.0)	(1.3)	(1.6)
population	-0.039**	-0.034**	-0.110**	-0.057**	-0.063**	-0.052**
	(-5.7)	(-3.7)	(-6.5)	(-9.6)	(-8.0)	(-3.5)
radio*vote margin at state level	-0.153**	-1.224**	-0.078*	-0.058**	-0.845**	-0.107**
	(-7.3)	(-16.3)	(-2.2)	(-2.9)	(-12.7)	(-3.3)
vote margin at state level	-0.111**	-0.003	-0.110**	-0.137**	-0.032	-0.068**
	(-7.6)	(-0.2)	(-3.9)	(-9.9)	(-1.9)	(-2.7)
vote margin	-0.030**	-0.026**	-0.031**	0.001	-0.003	-0.004
	(-5.3)	(-3.7)	(-3.8)	(0.1)	(-0.5)	(-0.5)
urban	-0.011	0.029	-0.053	-0.010	0.020	-0.054*
	(-0.6)	(1.2)	(-1.9)	(-0.7)	(1.0)	(-2.2)
school	0.111**	-0.114**	0.148**	0.023	-0.053	0.088**
	(8.7)	(-3.9)	(6.5)	(1.5)	(-1.9)	(3.9)
share illiterate		-0.372**			0.056	
		(-3.9)			(0.6)	
retail wage	-0.007	-0.004	-0.009	0.004	0.001	-0.002
	(-1.8)	(-0.7)	(-1.6)	(1.0)	(0.3)	(-0.3)
crop value/capita	0.007**	0.000	0.011*	0.006*	-0.007	0.017**
	(2.6)	(0.1)	(2.3)	(2.3)	(-1.8)	(4.0)
share black	0.113*	-0.092	0.575**	0.036	-0.159*	0.285**
	(2.1)	(-1.2)	(4.7)	(0.8)	(-2.4)	(2.7)
share immigrants	-0.025	-0.042	-0.847**	-0.124**	-0.186**	-0.203*
	(-1.2)	(-1.6)	(-9.0)	(-6.2)	(-7.7)	(-2.4)
R2	0.92	0.94	0.95	0.94	0.96	0.96
Number of observations	7425	5154	4624	7425	5154	4624

T-statistics in parenthesis.

Table 2.4. Dependent variable: votes per capita in gubernatorial elections 1920- 1940. Pooled regressions

	I	II	III
election year dummies	no	yes	no
state dummies	no	no	yes
share of hhlds with radios	**0.105**** **(18.8)**	**0.160**** **(14.8)**	**0.083**** **(16.8)**
share 21+	0.669** (26.6)	0.688** (29.2)	0.515** (20.1)
population	-0.012** (-6.7)	-0.008** (-5.0)	-0.011** (-7.0)
radio*vote margin at state level	-0.283** (-11.4)	-0.201** (-7.9)	-0.185** (-8.1)
vote margin	-0.097** (-15.4)	-0.094** (-16.0)	-0.066** (-12.8)
vote margin at state level	-0.130** (-8.9)	-0.139** (-9.4)	-0.066** (-4.1)
urban	-0.050** (-6.8)	-0.086** (-12.4)	-0.060** (-9.8)
school	0.162** (11.2)	0.164** (9.7)	0.102** (8.6)
retail wage	-0.005 (-1.4)	0.001 (0.3)	-0.004 (-1.3)
crop value/capita	0.009** (7.1)	0.005** (3.7)	-0.001 (-1.2)
share black	-0.215** (-23.7)	-0.175** (-20.1)	-0.109** (-13.4)
share immigrants	0.004 (0.3)	-0.032* (-2.3)	-0.060** (-4.0)
R2	0.66	0.71	0.80
Number of observations	7425	7425	7425

T-statistics in parenthesis.

Table 2.5.
Dependent variable: votes per capita in Presidential elections 1920, 1932, 1940.

	I	II	III	IV	V	VI
regression type	pooled	pooled	between	between	within	within
year dummy vars.	no	yes	no	yes	no	yes
share hhlds with radios	**0.096**** **(17.0)**	**0.051**** **(4.5)**	**0.216**** **(14.2)**	**0.239**** **(9.0)**	**0.073**** **(12.7)**	**0.036**** **(3.9)**
share 21+	0.851** (36.4)	0.806** (35.0)	0.610** (17.4)	0.582** (16.2)	0.185** (4.0)	0.258** (5.4)
population	-0.006** (-4.0)	-0.005** (-2.9)	-0.011** (-4.9)	-0.012** (-5.3)	-0.059** (-10.4)	-0.047** (-8.5)
radio*Pres. vote margin at state level	-0.589** (-17.8)	-0.545** (-16.5)	-1.301** (-16.4)	-1.202** (-14.4)	-0.117** (-5.2)	-0.108** (-5.0)
Pres. vote margin	-0.085** (-6.6)	-0.091** (-7.2)	-0.126** (-5.7)	-0.133** (-6.0)	0.028** (2.6)	0.022* (2.1)
Pres. vote margin at state level	-0.178** (-11.1)	-0.234** (-14.4)	-0.171** (-6.0)	-0.189** (-6.6)	-0.078** (-5.8)	-0.144** (-10.2)
urban	-0.050** (-7.2)	-0.048** (-7.0)	-0.039** (-3.8)	-0.041** (-4.1)	-0.003 (-0.2)	-0.012 (-0.9)
school	0.040** (2.9)	0.213** (13.3)	0.206** (7.9)	0.243** (9.0)	-0.016 (-1.5)	0.117** (8.8)
retail wage	0.009** (2.8)	-0.002 (-0.6)	0.002 (0.3)	-0.003 (-0.6)	-0.002 (-0.6)	-0.004 (-1.6)
crop value/capita	0.005** (3.9)	0.008** (6.4)	0.005** (2.6)	0.004* (2.3)	-0.015** (-6.6)	0.004 (1.6)
share black	-0.291** (-36.9)	-0.261** (-33.2)	-0.206** (-17.1)	-0.193** (-15.3)	0.022 (0.5)	0.127** (3.1)
share immigrants	-0.096** (-6.9)	-0.018 (-1.3)	-0.089** (-4.3)	-0.067** (-3.0)	-0.355** (-20.5)	-0.221** (-11.8)
C	-0.139** (-4.6)		-0.060 (-1.3)			
R2	0.69	0.71	0.75	0.766	0.95	0.95
Number of observations	7694	7694	7694	7694	7694	7694

T-statistics in parenthesis.

Table 2.6. Dependent variable: log per capita FERA spending.

	I	II	III	IV
State dummies	yes	no	yes	no
South excluded	no	no	yes	yes
***d_1*: share hhlds with radio**	**0.619****	**0.828****	**0.564****	**0.898****
	(3.2)	**(3.8)**	**(3.3)**	**(4.5)**
vote margin	-0.111	-0.206	-0.423**	-0.260
	(-0.7)	(-0.9)	(-2.8)	(-1.1)
unempl. 1930	7.696**	7.422**	6.231**	6.347**
	(4.3)	(3.1)	(3.6)	(2.9)
unempl. 1937	10.371**	11.175**	10.327**	10.072**
	(14.6)	(10.5)	(15.8)	(10.9)
retail wage	-0.259**	-0.327**	-0.215**	-0.396**
	(-3.3)	(-2.9)	(-2.7)	(-3.7)
crop value/capita	0.000	0.042	-0.027	-0.012
	(0.0)	(1.4)	(-1.3)	(-0.4)
median dwell. value	-0.019	-0.075	-0.073*	-0.130*
	(-0.5)	(-1.2)	(-2.0)	(-2.4)
value of farm buildings	-0.157**	-0.245**	-0.117**	-0.184**
	(-4.3)	(-5.8)	(-3.7)	(-4.6)
median rent	-0.016	0.027	0.146**	0.112
	(-0.3)	(0.4)	(2.6)	(1.5)
school	0.817**	0.914*	0.837**	0.464
	(2.7)	(1.9)	(3.1)	(1.1)
share illiterate	-1.713**	-3.970**	-1.471**	-3.915**
	(-3.6)	(-4.9)	(-3.3)	(-6.0)
share black	-0.044	-0.332	-0.114	-0.431
	(-0.5)	(-1.1)	(-1.5)	(-1.7)
share immigrants	0.283	0.043	-0.394	-0.154
	(0.8)	(0.1)	(-1.5)	(-0.6)
share urban	0.513**	0.401**	0.563**	0.488**
	(5.5)	(3.8)	(6.0)	(5.0)
pop. density	-0.067**	-0.081**	-0.019	-0.013
	(-2.9)	(-3.0)	(-1.1)	(-0.6)
population	-0.114**	-0.062*	-0.143**	-0.124**
	(-4.4)	(-2.0)	(-5.9)	(-4.2)
share 21+	-1.646**	-1.950**	-3.225**	-3.783**
	(-3.4)	(-2.8)	(-8.2)	(-7.5)
share 65+	-2.830	-2.645	-1.876	-0.978
	(-1.6)	(-1.2)	(-1.2)	(-0.5)
log(FERA budget per capita in state)			0.868**	0.830**
	()	()	(23.0)	(18.4)
C	6.540**	6.872**	3.878**	6.545**
	(9.0)	(6.6)	(6.0)	(7.3)
R2	0.62109	0.555795	0.54591	0.494937
Number of observations	2879.0	1925.0	2879.0	1925.0

Standard errors are heteroscedastic consistent. T-statistics in parenthesis.

* Denotes significance at 1 percent level. ** Denotes significance at 5 percent level.

Table 2.7. Dependent variable log per capita spending within FERA-program.

	I	II
South excluded	no	yes
c'_1: county share hhlds with radio/state share	**0.216****	**0.372****
	(4.5)	**(4.9)**
c'_{12}: state share hhlds with radio/national share	**0.527****	**0.630****
	(6.7)	**(6.6)**
c'_2: log(votes per capita/state votes per capita)	**0.209****	**0.546****
	(6.4)	**(6.0)**
c'_{22}: log(state electoral votes per capita/ national average)	**0.171****	**0.146***
	(2.8)	**(2.1)**
Pres. vote margin at county level	-0.405*	-0.335
	(-2.2)	(-1.4)
state vote squared deviation from 64 percent in pres. election	8.263**	5.994**
	(6.5)	(3.3)
state vote squared deviation from 50 percent in pres. election	-3.984**	-3.867**
	(-6.1)	(-2.7)
share illiterate in county/share illiterate in state	-0.114**	-0.104**
	(-5.4)	(-4.5)
share illiterate in state/national average	-0.068*	0.042
	(-2.0)	(0.7)
share in school in county/share in school in state	0.297	0.562
	(1.5)	(1.6)
share in school in state/national average	-0.637	0.228
	(-1.4)	(0.3)
unempl. 1930	6.732**	5.539*
	(3.8)	(2.5)
unempl. 1937	12.053**	13.148**
	(17.1)	(12.5)
retail wage	-0.156	-0.195
	(-1.9)	(-1.7)
crop value/capita	0.007	0.035
	(0.3)	(1.1)
median dwelling value	-0.137**	-0.226**
	(-3.5)	(-3.7)
value of farm buildings	-0.171**	-0.215**
	(-4.8)	(-4.8)
median rent	0.239**	0.360**
	(4.1)	(4.0)
share black	0.240**	-0.539*
	(2.8)	(-2.1)
share immigrants	1.199**	0.936**
	(4.0)	(2.9)
share urban	0.558**	0.411**
	(5.9)	(4.0)
pop. density	-0.111**	-0.110**
	(-5.6)	(-4.7)
population	-0.100**	-0.030
	(-3.8)	(-0.9)
share 21+	-3.671**	-4.336**
	(-9.0)	(-8.1)
share 65+	-1.011	-1.888
	(-0.6)	(-0.9)
C	8.546**	7.329**
	(7.3)	(4.9)
R2	0.51	0.43
Number of observations	2879	1925

Election year dummies are included but not shown. Standard errors are heteroscedastic consistent. T-statistics in parenthesis. *Denotes significance at 1 percent level, ** denotes 5 percent significance.

Table 2.8. Summary statistics

	Mean	Dev	Minimum	Maximum
per capita spending within FERA	19.83	15.21	0.12	225.67
share hhlds with radios	0.263	0.176	0.006	0.778
votes per capita in Gub. elect.	0.299	0.169	0.003	0.816
votes per capita in Pres. elect.	0.314	0.149	0.004	0.743
Gub. vote margin	0.067	0.066	0.000	0.546
unempl. 1930	0.011	0.009	0.000	0.086
unempl. 1937	0.037	0.016	0.004	0.136
share in school	0.739	0.061	0.379	0.892
share illiterate	0.041	0.043	0.000	0.351
share black	0.110	0.183	0.000	0.858
share immigrants	0.051	0.061	0.001	0.393
share urban	0.216	0.248	0.000	1.000
share 21+	0.554	0.062	0.356	0.762
share 65+	0.041	0.015	0.005	0.094
retail wage	1137	192	500	1810
crop value/capita	135	112	0	1041
median dwell.value	2572	1322	536	20000
value of farm buildings	193	149	0	849
median rent	1447	672	429	5204
pop. density	1210	17016	2	848778
population	40329	129292	1268	4014611

Table 2.9. **Correlation Matrix**

	FERA	RADIO	G34TUO	P32TUO
FERA	1.00			
RADIO	0.25	1.00		
G34TUO	0.27	0.61	1.00	
P32TUO	0.26	0.66	0.93	1.00

Table 2.10. Variable Definitions

per capita spending within FERA:	Cumulative disbursement within the FERA program April 1933 to December 1935/(0.6*population size 1930 + 0.4*population size 1940).
share hhlds with radios:	families reporting radio sets/total number of families 1930.
votes per capita in Gub. elect.:	total votes cast in Gubernatorial elections 1933-1936/((election year-1930)*population 1940 + (1940-election year)*population 1930)/10.
votes per capita in Pres. elect.:	total votes cast in Presidential elections 1932/ (0.2* population 1940 + 0.8*population 1930).
Gub. vote margin:	absolute deviation of winning candidate/ (votes of winning candidate+votes of second placed candidate) at county from the same variable at state level.
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 in thousands of dollars 1930/number of full-time employees of retail distribution stores 1930.
crop value/capita:	total value of all crops harvested 1929/population 1930.
median dwell.value:	median value of owner-occupied dwelling units, 1930.
value of farm buildings:	value of farm buildings 1930/population 1930.
median rent:	median monthly contract rent of tenant-occupied dwelling units, 1930.
share in school:	number of persons 7-18 years of age attending school/ number of persons of age 7-18.
share illiterate:	number of persons ten years of age and over who are illiterate 1930/ 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.
pop. density:	population per square mile 1930.
population:	0.6*population 1930 + 0.4*population 1940.
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.