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Socialism for Red States in the Electric Utility Industry

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ABSTRACT

TVA and the other federal electric utilities were created under Democratic administrations, and their service territories were initially bluer than average. These subsidized enterprises sell cheap power preferentially to non-investor-owned distributors, so such utilities are more prominent where the federal utilities are important sellers. The political map of the U.S. has changed dramatically since the federal utilities were created. The federal utilities and non-investor-owned distributors are now more important on average in red states than in blue ones. Interest has trumped ideology: Republican policy-makers strongly opposed to socialism in principle seem happy with the important role of government enterprises in the U.S. electric utility industry.

JEL: L32, L94, N72, Q48, H42

I. INTRODUCTION

The federal government's role in the electric power sector began under President Theodore Roosevelt with the passage of the Reclamation Act of 1902.¹ That Act provided for the construction of dams for irrigation 20 Western states. This project was managed by an agency that became the Bureau of Reclamation within the Department of the Interior. The Reclamation Act of 1906 stated explicitly that electricity generated at those dams that was not needed to power irrigation pumps could be sold, as it evidently already had been, with preference given to municipal utilities. Variants of this "preference clause," extended to cover other non-investor-owned utilities, were associated with the subsequent federal power enterprises mentioned

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¹ Except where noted, the history in this section is based on EDWIN VENNARD, *GOVERNMENT IN THE POWER BUSINESS* ch. 3 (1968).

below.² The federal role in the electric power industry initially grew very slowly: in 1932 the federal government had only 2.5% of national hydroelectric capacity.³

In 1918 the Army Corps of Engineers began work on a large dam at Muscle Shoals, Alabama that was intended to provide electricity to plants designed to produce nitrates for use in explosives in World War I. The war ended shortly after construction on the dam began, however. During the 1920's several private firms offered to buy the Muscle Shoals facility, and public power advocates introduced several bills in Congress to make the federal government the dam's permanent owner and operator. President Coolidge, whose attitude toward the proper role of government was much more typical of Republicans than President Roosevelt's had been, killed one of these bills by pocket veto. His Republican successor, Herbert Hoover, vetoed another such bill in 1931 because, he said, it "would launch the Federal government upon a policy of competition instead of by the proper government function of regulation for the protection of all the people." He argued that "for the Federal government deliberately to go out to build up and expand ... a power and manufacturing business is to break down the initiative and enterprise of the American people; ... it is the negation of the ideals upon which our civilization has been based."

The election of President Franklin Roosevelt in 1932 ushered in a very different era in this industry. In April, 1933, just over a month after his inauguration, he called on Congress to create the Tennessee Valley Authority (TVA), and Congress obliged later that year. President Roosevelt supported passage of the Rural Electrification Act of 1936, which authorized the Rural Electrification Administration in the Department of Agriculture to provide loans and other assistance to cooperatives providing electricity in rural areas.⁴ In 1935, only about 11% of farms had electricity; by 1940 the number of farms with electricity had increased by 230%.⁵ Like the expanded preference clause in the legislation creating the TVA, the exclusion of investor-owned utilities (IOUs) from subsidies for rural electrification seem to have reflected Roosevelt's preference for government enterprises over investor-owned utilities.⁶

² DAVID SCHAP, MUNICIPAL OWNERSHIP IN THE ELECTRIC UTILITY INDUSTRY 83 (1986).

³ *Id.*, Table 4.4.

⁴ The Rural Electrification Administration was renamed the Rural Utilities Service in 1994.

⁵ *Robert T. Beall*, RURAL ELECTRIFICATION, in U.S. YEARBOOK OF AGRICULTURE 1940, U.S. Department of Agriculture, 802 (1940), <http://naldc.nal.usda.gov/naldc/download.xhtml?id=IND43893747&content=PDF>.

⁶ VENNARD, *supra* note 1, at 38.

President Roosevelt proposed establishment of the Bonneville Power Authority (BPA) in February, 1937, and Congress obliged six months later. The Southwestern Power Authority (SWPA) was created by executive order in 1943, and the Southeastern Power Authority (SEPA) was similarly established in 1950 during the Truman administration.

TVA and the Power Authorities, like the Bureau of Reclamation, were primarily in the business of selling hydroelectric power from federal facilities, and, under five Democratic administrations, federal hydro capacity expanded rapidly. By 1952, federal hydro capacity was just over 35 times as large as it had been in 1932, and federal facilities accounted for 40.5% of total national hydro capacity.⁷ In addition, the preference clauses under which the federal utilities operated provided strong incentives for the creation of municipal utilities to access cheap power, and more than 550 municipal ownership elections were held between 1934 and 1939 alone.⁸

President Eisenhower seems to have been less adamantly opposed to federal production and sales of electricity than President Hoover had been. In a press conference, he mused regarding TVA, “So we get to this curious thing in the socialistic theory: that we, all of us, provide such cheap power to one region—apparently it is subsidized by taxes from all of us all over the country—but then it can appeal and take away industries from the other sections of the country.” While he went on to call for “some kind of reevaluation of all these things,” he reminded his audience that: “As I have stated a thousand times, I am not out to destroy TVA.”⁹ In any case, by the end of the Eisenhower years in 1960, federal hydro capacity accounted for 45.2% of national hydro capacity.

Relatively little happened on this front between 1960 and 1980. The Alaska Power Authority (APA) was established in 1967, in the Johnson administration. And in 1977, in the Carter administration, the Western Area Power Authority (WAPA) took over power marketing and high-voltage transmission operations of the Bureau of Reclamation. This was a re-organization, rather than an expansion of the federal role.¹⁰ Between 1960 and 1980, under three

⁷ *Id.*, Tables 4.4 and 4.5.

⁸ SCHAP, *supra* note 2, 84-85.

⁹ Dwight D. Eisenhower, *News Conference June 17, 1953*,
<http://www.presidency.ucsb.edu/ws/index.php?pid=9611&st=&st1=>

¹⁰ See, e.g., Vennard, *supra* note 1, 131.

Democratic and two Republican administrations, the federal share of national hydro capacity drifted up slightly to 46.1%.¹¹

Apart from the APA, the geographic coverage of the federal electric utilities was established by 1950. Rural electrification via federally-subsidized cooperatives was largely complete by the early 1950s: by 1953 more than 90% of U.S. farms had electricity.¹² And the battles over IOU versus municipal electricity distribution that had raged during the 1920s and 1930s became much less common by the 1960s.¹³ As we find below, data from 1950 or earlier can help explain the roles of the federal utilities and non-IOU distribution enterprises in recent years.

President Ronald Reagan was elected in 1980 preaching that government was the problem, not the solution.¹⁴ In the U.K., Prime Minister Margaret Thatcher's contemporaneous rhetoric was similar. Her government privatized British Telecom in 1984 and the electric utility industry a few years later. The U.K. example was rapidly and widely imitated in other nations: a comprehensive survey of empirical studies of privatization published in 2001 found that "privatization now appears to be accepted as a legitimate—often a core—tool of statecraft by governments of more than 100 countries."¹⁵ That same study concluded that, "We know that privatization 'works,' in the sense that divested firms almost always become more efficient, more profitable, and financially healthier, and increase their capital spending."¹⁶ Nonetheless, despite President Reagan's professed admiration for Mrs. Thatcher and the positive experience with privatization in the U.K. and elsewhere, the U.K. example was not imitated by the

¹¹ SCHAP, *supra* note 2, Table 4.5.

¹² NRECA, History of Electric Co-ops, <http://www.nreca.coop/about-electric-cooperatives/history-of-electric-co-ops/>

¹³ See SCHAP, *supra* note 2, 9-10 (showing numbers of municipal utilities originated and discontinued by year through 1981).

¹⁴ In 1962, Reagan may have been fired from his job as host of the television series General Electric Theater after criticizing TVA as an example of "big government." Martin Fridson, *Republicans Reverse History with TVA Defense*, *Forbes*, May 3, 2014. <http://www.forbes.com/sites/investor/2013/05/03/republicans-reverse-history-with-tva-defense/#7997bd162858>

¹⁵ William L. Megginson and Jeffrey N. Netter, *From State to Market: A Survey of Empirical Studies of Privatization*, 39 *Jl. Econ. Lit.*, 321 (2001).

¹⁶ *Id.* at 381.

Republican administrations of Ronald Reagan or George H.W. Bush. Neither advanced serious proposals to privatize any of the federal electric utilities.¹⁷

Indeed, by the (Democratic) Clinton administration, the two political parties seem to have switched roles in debates about the federal role in the electric power industry. President Clinton proposed privatizing the APA and managed to accomplish it in the late 1990s, but his fiscal 1996 budget proposals to privatize the SEPA, SWPA, and WAPA were rebuffed.¹⁸ Eight years later, in his fiscal 2014 budget message, President Obama raised the possibility of privatizing TVA:¹⁹

Reducing or eliminating the Federal Government's role in programs such as TVA, which have achieved their original objectives and no longer require federal participation, can help put the nation on a sustainable fiscal path. Given TVA's debt constraints and the impact to the Federal deficit of its increasing capital expenditures, the Administration intends to undertake a strategic review of options for addressing TVA's financial situation, including the possible divestiture of TVA, in part or as a whole.

This possibility was strongly opposed by Republican lawmakers as "a very bad idea" and even "bizarre."²⁰ The idea got no traction, and the Obama administration did not seriously pursue TVA privatization.

By the 1990s, then, Democrats had become the advocates of privatization, while Republicans had become the defenders of the federal electric utilities. And, apart from the APA, the Republican defense has been successful. By 2010, federal hydro capacity had grown 19% since 1980 and accounted for 42.3% of national hydro capacity. The overall generating capacity of the federal utilities was 80% above their hydro capacity, largely because of TVA's substantial

¹⁷ It seems that an interagency group in the first Regan administration did study the possibility of privatizing TVA and BPA, but its work was stopped by Congress. Richard L. Stroup, "Niskanen Laws," *Christian Science Monitor*, July 25, 1985, <http://www.csmonitor.com/1985/0725/enisk.html/%28page%29/2>

¹⁸ THE BUDGET MESSAGE OF THE PRESIDENT FOR FISCAL YEAR 1996, 196, <https://www.gpo.gov/fdsys/pkg/BUDGET-1996-BUD/pdf/BUDGET-1996-BUD.pdf>. The APA privatization is discussed below.

¹⁹ THE BUDGET MESSAGE OF THE PRESIDENT FOR FISCAL YEAR 2014, 51, <https://www.gpo.gov/fdsys/pkg/BUDGET-2014-BUD/pdf/BUDGET-2014-BUD-4.pdf>.

²⁰ Fridson, *supra* note 14.

fossil and nuclear facilities, and the federal utilities accounted for 6.6% of the nation's total generating capacity.²¹

On the surface, this change of partisan roles is curious. As President Eisenhower recognized, the federal electric utilities are subsidized through their ability to raise capital at below-market rates. They can borrow directly from the Federal Government, and TVA and BPA can sell bonds to private investors at favorable rates because the market perceives that their non-Federal debt is guaranteed by the Federal Government. The Energy Information Agency estimated the total subsidy to the federal electric utilities in Fiscal Year 2010 alone was between \$119 and \$668 million.²² By eliminating federal loans to these entities as well as implicit guarantees of their non-federal debt, privatization would reduce the scope of the federal government, an important Republican objective in recent years. Elimination of federal loans would reduce the federal deficit and, of course, privatization would produce significant sales revenue, up to \$62 billion according to a 1997 study by the Congressional Budget Office.²³ Such substantial deficit reduction not requiring spending cuts or incremental taxation should have broad bipartisan appeal.

The first key to understanding contemporary Republican support for these government enterprises created by Democrats—as well as Democrats' interest in privatizing those same enterprises—is to recognize, as President Eisenhower did, that the federal electric utilities benefit some regions at the expense of others. This pattern is outlined in Section II, where the data used in subsequent quantitative analyses are described. The second key is to recognize that a substantial change in the political geography of the U.S. has taken place since the 1932-1950 period when all of the federal utilities except the APA were established. As Section III demonstrates, the beneficiaries of this program were bluer than average in this early period but are redder than average today. Contemporary Republican support for socialism in electric power can thus be understood as a simple triumph of interest over ideology.

²¹ EDISON ELECTRIC INSTITUTE, STATISTICAL YEARBOOK OF THE ELECTRIC POWER INDUSTRY 2010 (2014).

²² ENERGY INFORMATION ADMIN. (EIA), DIRECT FEDERAL FINANCIAL INTERVENTIONS AND SUBSIDIES IN ENERGY IN FISCAL YEAR 2010, 56-57 (2011), [HTTP://WWW.EIA.GOV/ANALYSIS/REQUESTS/SUBSIDY/ARCHIVE/2010/PDF/SUBSIDY.PDF](http://www.eia.gov/analysis/requests/subsidy/archive/2010/pdf/subsidy.pdf).

²³ CONGRESSIONAL BUDGET OFFICE (CBO), SHOULD THE FEDERAL GOVERNMENT SELL ELECTRICITY? Ch. 5 (1997), <https://www.cbo.gov/sites/default/files/105th-congress-1997-1998/reports/electric.pdf>. See also Ch. 6 on the net budgetary impact of privatization under various assumptions.

Section II also presents the geographic pattern of the importance of non-investor-owned utilities—municipal utilities, cooperatives, state agencies, and special-purpose entities—in electricity distribution. Section III shows that states where these enterprises are currently important were also somewhat bluer than average in the 1932-1950 period but are redder than average now. Since these local enterprises are not directly subsidized by taxpayers in other parts of the country, it may seem odd that states that became more Republican over this period nonetheless continued to embrace public ownership of distribution utilities – socialism at the retail level. Part of the answer lies in the effects of the “preference clause” that has guided the operation of the federal utilities since 1906, but institutional inertia seems also to have been important. Another part lies in the importance of continuing subsidies to rural electric cooperatives, estimated by the Energy Information Administration to amount to up to \$319 million in 2010 alone.²⁴

Section III describes the statistical analysis that supports these assertions, and Section IV provides brief concluding observations.

II. DATA

A. The Federal Utilities

In what follows I use *FEDSHR*, the ratio of federal utilities’ total sales (in megawatt-hours) to total retail sales in each state in recent years as a measure of the contemporary importance of the federal utilities. Most of the federal utilities sales are at the wholesale level, and wholesale sales exceed retail sales by the amount of losses in the distribution system. While these losses will vary from state to state, they amount to only a few percent on average, and variation in them is unlikely to be a major source of measurement error. Each federal utility has a designated service area, and I use *FEDANY*, a dummy variable equal to one if *FEDSHR* is positive in a state and equal to zero otherwise, as an indicator of the presence of the federal utilities.

To construct the first measure of *FEDSHR*, I obtained state-level sales from the federal utilities’ documents for recent years and computed the ratio of those sales to total retail sales obtained from the Energy Information Agency.²⁵ After constructing the first measure, I found

²⁴ EIA, *supra* note 22, 56.

²⁵ TVA’s Fiscal 2011 sales were obtained from its website on May 27, 2012. (I have copies of the relevant pages.) BPA’s projected average sales in fiscal 2012 and 2013 were taken from data submitted in its 2012 Rate Case (BP-

data on the ratio of federal sales to total retail sales in 1995 in a Congressional Budget Office study.²⁶ Excluding Alaska, Hawaii, and the District of Columbia for reasons discussed below, the correlation between these two series is 0.98, and the corresponding values for *FEDANY* were all equal. This demonstrates the stability of the federal utility presence in recent years. I use the average of the two values of *FEDSHR* in what follows. I have seen nothing to indicate that the geographic scope of the federal utilities as measured by *FEDANY* has changed since the early 1950s, at the end of the formative period of the federal utilities. Unfortunately, data on *FEDSHR* for that early period seem not to be available.

An important reason for excluding Alaska, Hawaii, and the District of Columbia from the quantitative analysis that follows is that votes in Presidential elections, a standard measure of political preference that I use, are not available for these jurisdictions until 1960, well after the federal utilities were created. All three are outliers in other senses as well. The District of Columbia generates almost none of the electricity it consumes. Hawaii has virtually no hydroelectric potential—hydro accounted for less than 1% of its generation in 2010—and both Hawaii and Alaska are not electrically connected to any other states. Finally, the Alaska Power Authority was created much later than the other federal utilities, and it was privatized in the late 1990s. Privatization involved giving the two dams operated by the APA to their customers in exchange for their paying off the corresponding debts to the federal government, thus baking in the initial capital subsidies.²⁷ It seemed better to exclude Alaska from the analysis than to adopt any simple characterization of its relation to the federal utilities in recent years.

Figure 1 shows the geographic pattern of *FEDSHRs*. The 16 unshaded states in the Northeast received no federal electricity in recent years.²⁸ For the 18 lightly shaded states,

12). WAPA's Fiscal 2010 sales were taken from the Statistical Appendix to its 2011 ANNUAL REPORT. SEPA's Fiscal 2010 were taken from its 2010 ANNUAL REPORT. All these were compared to calendar 2010 sales from ENERGY INFORMATION AGENCY (EIA), STATE ELECTRICITY PROFILES 2010, DOE/EIA-0348(01)/2 (2012). SWPA's Fiscal 2008 sales by customer were obtained from its 2008 ANNUAL REPORT. Webpages and other sources were used to allocate customers' sales to states, and state totals were compared to calendar 2008 sales from EIA, STATE ELECTRICITY PROFILES 2008.

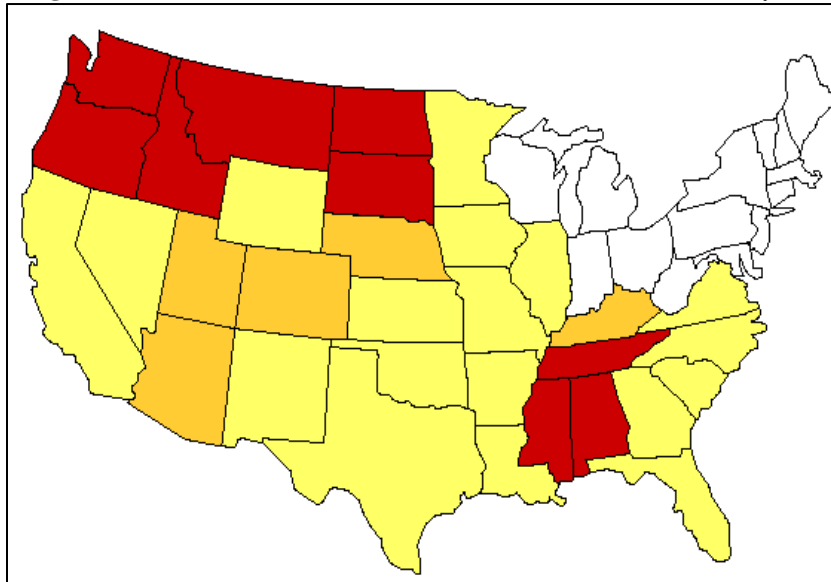
²⁶ CBO, *supra* note 23, 70.

²⁷ See, e.g., Rick Sinott, *Eklutna, Snettisham hydro projects still haven't redressed fish and wildlife damages*, Alaska Dispatch News, June 21, 2013, <http://www.adn.com/voices/article/eklutna-snettisham-hydro-projects-still-haven-t-redressed-fish-and-wildlife-damages/2013/06/21/>

²⁸ These states are Connecticut, Delaware, Indiana, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Wisconsin, and West Virginia. West

federal utility sales were positive but accounted for less than 5% of total retail sales.²⁹ Five states, somewhat more darkly shaded and served by TVA or WAPA, had federal utility sales between 5% and 15% of total retail sales.³⁰ Finally, for the nine most darkly shaded states in Figure 1, federal utility sales accounted for 15% or more of total retail sales in recent years. These states, with the corresponding percentages in parentheses, are Alabama (23), Mississippi (26), and Tennessee (94), all served by TVA, and Idaho (15), Montana (33), North Dakota (26), Oregon (37), South Dakota (23), and Washington (53), all served by BPA.

Figure 1. Federal utilities' sales relative to total retail sales in recent years



Note: See text for explanation of shading.

While the costs of subsidizing the federal utilities are borne by all taxpayers, 16 states receive absolutely no benefits, and 18 others receive few benefits, though some communities within the latter states might have a lot to lose if their federal utility supplier were privatized. The nine darkly shaded states in Figure 1 receive substantial net benefits. These programs thus have concentrated benefits and relatively diffuse costs, so that privatization would have diffuse benefits and concentrated costs.

Virginia may have been in SEPA's territory (Nic Lane, *POWER MARKETING ADMINISTRATIONS: BACKGROUND AND CURRENT ISSUES*, CONGRESSIONAL RESEARCH SERVICE, Order Code RS22564, 2 (2007).) But it made no sales there in 1995 or 2010.

²⁹ These states are Arkansas, California, Florida, Georgia, Illinois, Iowa, Kansas, Louisiana, Minnesota, Missouri, Nevada, New Mexico, North Carolina, Oklahoma, South Carolina, Texas, Virginia, and Wyoming. *FEDSHR* was less than 0.50% for Florida, Illinois, Texas, and Wisconsin.

³⁰ These states are Arizona, Colorado, Kentucky, Nevada, and Utah.

B. Non-Investor-Owned Distributors

Our measure of the importance of non-investor-owned distribution utilities, *NONIOU*, is simply 100 minus the percentage share of investor-owned utilities in total retail sales in 2010.³¹ Figure 2 exhibits the geographic pattern of *NONIOU*. As in Figure 1, darker shades correspond to higher values. Comparing the two Figures reveals similarities in the East, particularly in the region served by TVA and the region with no federal utility presence, as well as striking differences in the West. The overall correlation between *FEDSHR* and *NONIOU* is 0.66.

All states in this sample had positive values of *NONIOU*, though four had values below 2.0%, and all but Nebraska had values below 100%.³² In the 20 unshaded states, non-investor-owned utilities accounted for less than 20% of retail sales.³³ In the 19 lightly-shaded states, non-investor-owned utilities accounted for between 20% and 40% of retail sales,³⁴ and in the nine heavily shaded states, these utilities accounted for more than 40% of retail sales. Those nine states, with values of *NONIOU* in parentheses are Arizona (45), Colorado (43), Kentucky (53), Mississippi (53), Nebraska (100), North Dakota (57), South Dakota (50), Tennessee (98), and Washington (64).

The earliest available data on the share of IOUs in total retail sales seem to be for 1986.³⁵ Over the period 1986-2010, the (unweighted) average share of non-IOU distributors rose slightly, from 25.2% to 28.3%. The correlation between the values for 1986 and 2010 is 0.98, with no obvious pattern to the changes between these two years. Thus *NONIOU* seems to have been stable in recent years. And, as noted above, local battles over municipal ownership became increasingly rare after around 1960.

³¹ From EIA, STATE ELECTRICITY PROFILES 2010, *supra* note 25.

³² Hawaii and the District of Columbia were served only by investor-owned utilities. The four states with values of *NONIOU* below 2.0% are Maine, New Jersey, Rhode Island, and West Virginia.

³³ These states are Connecticut, Idaho, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Michigan, Nevada, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Utah, Virginia, West Virginia, and Wisconsin. The software used to color this map was unable to shade Delaware without also shading Maryland.

³⁴ These states are Alabama, Arkansas, California, Delaware, Florida, Georgia, Iowa, Kansas, Minnesota, Missouri, Montana, New Mexico, North Carolina, Oklahoma, Oregon, South Carolina, Texas, Vermont, and Wyoming. The software used to color this map was unable to shade Delaware without also shading Maryland.

³⁵ From EIA, STATE ELECTRICITY PROFILES 1996 (1999).

<i>DVLATE</i>	49.06	9.41	67.02	29.44
<i>RUI950</i>	44.5	15.98	73.40	13.40
<i>RU2010</i>	26.64	14.58	61.34	5.05

Note: See text for sources and definitions; all data are for the 48 Continental States.

A public interest theory might predict that the federal utilities would have been assigned to serve states with relatively low incomes, since these enterprises delivered regional subsidies. My formative-period income measure is *RPI1950*, personal income per capita in 1950, expressed as a percentage of the (unweighted) sample mean. A public interest theory of the determinants of the scope of the federal utilities might also suggest that their scope would change over time to reflect changes in states' relative incomes. That would imply that *RPI2010*, constructed like *RPI1950* but using 2010 data, would be more useful in explaining the utilities' current scope.³⁷

A political economy theory of the initial scope of the federal utilities, on the other hand, would suggest that states' partisan affiliations in the formative 1932-1950 period should matter. I measure this by *DVEARLY*, the average of the percentage vote for the Democratic candidate in the 1932 and 1952 Presidential elections.³⁸ *DVLATE* is, similarly, the average of the Democratic vote in the 2008 and 2012 Presidential elections. It should have explanatory power, with the same coefficient sign as *DVEARLY*, if the scope of the federal utilities has changed in response to political changes. Because of the breakdown of the Roosevelt coalition and the rise of the Republican party in what had been the solid Democratic south, the correlation between *DVEARLY* and *DVLATE* is -0.37.

Figure 3 provides information on the geographic pattern of these changes. In the 18 unshaded states, *DVLATE* exceeded *DVEARLY* by more than five percentage points, while in the 15 darkly shaded states, the Democratic vote share fell by more than 10 percentage points.³⁹

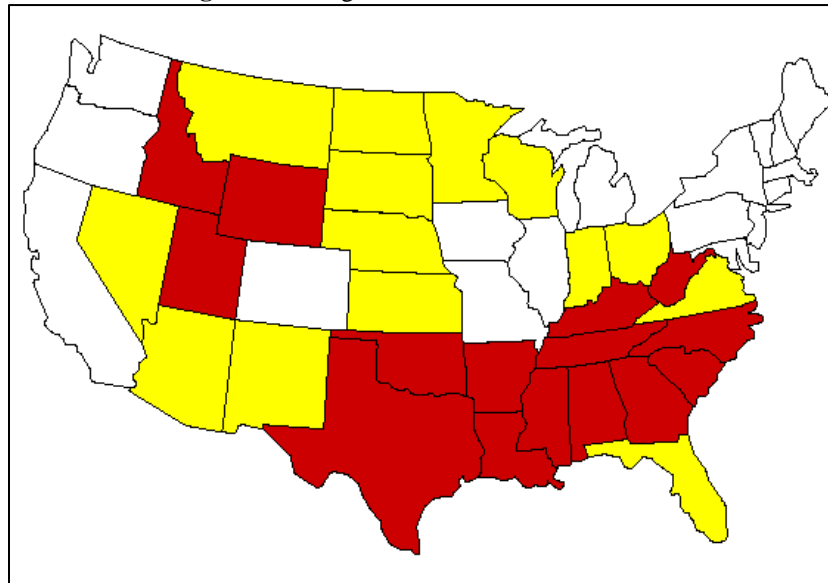
³⁷ Personal income per capita in 1950 and 2010 were downloaded from the Bureau of Economic Analysis, <http://www.bea.gov/regional/downloadzip.cfm>. The correlation between *RPI1950* and *RPI2010* is 0.62.

³⁸ Voting data were downloaded from <http://uselectionatlas.org/>. There were non-trivial changes in the political map between 1932 and 1952; the correlation between the Democratic vote shares in those two Presidential elections was only 0.58. On the other hand, as discussed in the text, there were much greater shifts between the early and late periods considered here.

³⁹ Note from Table 1 that the unweighted average Democratic vote share fell by just over four percentage points between these two periods. The 18 states that became significantly bluer are California, Colorado, Connecticut, Delaware, Illinois, Iowa, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington. The 15 states that became significantly redder are Alabama, Arkansas, Georgia, Idaho, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Utah, West Virginia, and Wyoming.

Comparing Figure 3 with Figures 1 and 2 shows the strongest similarities in the South, particularly in the area served by TVA, and in the Northeast.

Figure 3. Changes in Democratic vote shares.



Note: See text for explanation of shading.

Turning now to *NONIOU*, one would expect to see more reliance on non-investor-owned distribution utilities in states in which such utilities had greater access to subsidized power. This makes *FEDSHR* a plausible explanatory variable. The more rural a state was during the 1932-1950 period, the greater the potential scope for the formation of federally subsidized rural electric cooperatives. This points to *RU9150*, the percentage of the population that was rural in 1950 as another plausible explanatory variable. On the other hand, if a state became more or less urbanized between 1950 and 2010, one might expect *RU2010*, the percentage rural in 2010 to be a better predictor of the scope of rural coop activity in the latter year.⁴⁰

Finally, partisan preference is a plausible proxy for the mean ideologies of state and local decision-makers, with, traditionally and following Franklin Roosevelt, Democrats being more favorable to government enterprise than Republicans. That suggests that states with high values of *DVEARLY* might have higher values of *NONIOU*, all else equal, and *DVLATE* might have

⁴⁰ Both *RU1950* and *RU2010* were downloaded from the U.S. Bureau of the Census, <https://www.census.gov/search-results.html?q=state+rural+population&search.x=0&search.y=0&search=submit&page=1&stateGeo=none&searchtype=web>. The correlation between these two variables is 0.78.

predictive power, with a positive coefficient, if state and local decisions have changed to reflect changes in party affiliation and ideology.

III. ANALYSIS AND RESULTS

A. The Federal Utilities

The first two columns of Table 2 report probit estimates using early-period variables that attempt to explain the geographic scope of the federal utilities.⁴¹ The results in the first column seem consistent with a public interest model in which the federal utilities were primarily an income transfer vehicle, with service territories covering relatively poor states, regardless of their hydro potential. However, the second column shows that early-period partisan preference has more explanatory power. Relative income is no longer close to significant, hydro potential remains insignificant, and the best predictor of whether or not a state was selected for service by a federal electric utility is how blue it was during the Roosevelt-Truman years.⁴²

The third and fourth columns report tobit estimates using early-period variables that attempt to explain the importance of the federal utilities.⁴³ In both columns, *HYDRO* is highly significant. As noted above, this is probably to some extent an artifact, since the federal utilities accounted for over 40% of total hydroelectric capacity in 2010. The results in column 3, like those in column 1, suggest an income transfer role for the federal utilities, but *RPII950* falls from significance when *DVEARLY* is added to the equation reported in column 4, and *DVEARLY* is nearly significant at the 10% level. While the results in these first four columns are hardly definitive, they do not provide much support for a pure public interest theory of either federal utilities' service territories or their importance within them. They provide more support for a model in which states that leaned Democratic were rewarded with federally subsidized electricity.

The last two columns in Table 2 examine the relation between the coverage and importance of the federal utilities and late-period relative income and partisan preference

⁴¹ In all cases in Table 2, logit and probit results were qualitatively equivalent.

⁴² The correlation between *DVEARLY* and *RPII950* is -0.58; blue states tended to be poorer than average.

⁴³ Because of the large number of zero observations of *FEDSHR*, it is appropriate to estimate a censored regression model, for which tobit is the standard estimation method, rather than using least squares.

variables. Column 5 indicates that the more *Republican* a state was in 2010, the more likely it was to be served by a federal utility.⁴⁴ As in column 2, neither *HYDRO* or relative per-capita personal income added significant explanatory power. In column 6, like column 4, the coefficient of *HYDRO* is positive and highly significant, but the coefficient of the Democratic share of the Presidential vote, *DVLATE*, is now *negative* and significant at the 6% level.

Table 2. Explaining the scope of the federal electric utilities

Dependent variable:	<i>FEDANY</i>	<i>FEDANY</i>	<i>FEDSHR</i>	<i>FEDSHR</i>	<i>FEDANY</i>	<i>FEDSHR</i>
Estimation method:	Probit	Probit	Tobit	Tobit	Probit	Tobit
Independent variables:						
Constant	2.40** (1.00)	-6.07** (3.00)	27.61** (12.73)	-17.56 (30.94)	6.45*** (1.83)	57.91*** (22.46)
<i>HYDRO</i>	0.017 (0.012)	0.030 (0.019)	0.454*** (0.119)	0.491*** (0.120)	0.025 (0.018)	0.407*** (0.118)
<i>RPI1950</i>	-0.021** (0.009)	-0.009 (0.013)	-0.295** (0.129)	-0.141 (0.158)		
<i>DVEARLY</i>		0.143*** (0.051)		0.548 (0.344)		
<i>RPI2010</i>					-0.008 (0.020)	-0.265 (0.253)
<i>DVLATE</i>					-0.107*** (0.039)	-0.679* (0.360)
Standard Error:	0.448	0.397	15.17	15.17	0.380	15.57

Note: See text for variable definitions. Asterisks indicate significance at the 10%(*), 5%(**), and 1%(***) levels.

Table 3 points the way to an explanation of this difference. The first line indicates that the (unweighted) average Democratic share of Presidential votes declined slightly between the early and late periods, with those states showing a decline only slightly outnumbering those that showed an increase. The second line shows that the states that were not served by the federal utilities became substantially bluer on average, with 14 of the 16 states involved showing an increase in the Democratic percentage. In eight of those 14 states, the increase in the Democratic share exceeded 10 percentage points. In contrast, as the third line shows, those states served by

⁴⁴ The correlation between *DVEARLY* and *FEDANY* is 0.45 and between *DVEARLY* and *FEDSHR* is 0.11. In contrast, the correlation between *DVLATE* and *FEDANY* is -0.56 and between *DVLATE* and *FEDSHR* is -0.22.

the federal utilities became substantially redder on average, with 24 of the 32 states involved showing a decrease in the Democratic percentage. In 14 of those 24 states, the decrease was greater than 10 percentage points.

Table 3. Changes in state-level political preferences v. *FEDANY*

	Mean		Change	Number of Changes	
	<i>DVEARLY</i>	<i>DVLATE</i>		Positive	Negative
All States	53.33	49.06	-4.27	22	26
<i>FEDANY</i> = 0	46.94	56.74	9.53	14	2
<i>FEDANY</i> = 1	56.52	45.35	-11.18	8	24

Note: See text for variable definitions.

In short, it appears that the federal electric utilities were established and developed, at least in part, to benefit states that tended to vote Democratic. As those states became much less blue over time, and institutional inertia maintained the scope of the federal utilities, red states became the beneficiaries of these government enterprises. And Republicans, particularly from those states that directly benefitted from the federal utilities, became their defenders. Democrats, ideologically more favorable to government enterprise than Republicans but increasingly representing states that paid for the subsidies to the red states served by the federal utilities, became advocates of privatization. Not surprisingly, and not atypically, interests trumped ideology.

B. Non-Investor-Owned Distributors

Table 4 presents regressions attempting to explain variations in *NONIOU*, the share of non-investor-owned distribution utilities in states' total retail sales. Following the pattern of Table 2, the first two columns use early-period independent variables, and the final two columns use late-period variables.

The results in the first column are consistent with a model in which the decisions at the state and local level regarding public versus private enterprise in electricity distribution are driven by economic interest: non-investor-owned distributors are more important where the federal utilities are more important, so there is more opportunity to acquire power at below-market rates, and in states with a larger fraction of the population in rural areas, which are thus better positioned to benefit from federal subsidies for rural electrification. Adding relative income in 1950 (on the grounds that lower-income voters might be more eager for federal

subsidies), an interaction term between *FEDSHR* and *RUI950* (on the grounds that subsidies for rural electrification are more attractive the greater the opportunity to buy cheap power from federal utilities), or the square of *FEDSHR* (on the grounds that if the local federal utility accounts for a very large share of generation, investor-owned utilities can also buy preference power) did not improve the explanatory power of this equation. There is no support in the column 1 estimates for the notion that Democratic-leaning voters were more likely to favor public enterprise at the state and local level.

Nebraska had much the largest residual from this equation. Nebraska was a red state in the early period (*DVEARLY*=46.9) that became redder (*DVLATE*=39.8). While it is served by WAPA, federal electricity is not particularly important (*FEDSHR*=8.3%). While it was a fairly rural state in 1950 (*RUI950*=53.1%), cooperatives accounted for only 2% of retail sales in 2010. The second column shows the results when a dummy variable equal to one for Nebraska and zero for all other states is added to the equation in the first column. The equation's explanatory power is increased substantially, and the coefficient of *DVEARLY* is now larger and significant at the 10% level. This provides weak evidence for the proposition that early-period red states – except Nebraska! – were likely to choose to rely more on IOUs to distribute electricity.

Table 4. Explaining the importance of non-investor-owned distributors

Dependent variable is NIOU; estimation method is least squares

Independent Variables:

Constant	-4.220 (12.23)	-9.596 (8.88)	51.44*** (15.32)	40.15*** (11.97)
<i>FEDSHR</i>	0.728*** (0.139)	0.743*** (0.100)	0.767*** (0.140)	0.786*** (0.108)
<i>RUI950</i>	0.403** (0.153)	0.318*** (0.112)		
<i>RUI2010</i>			0.027 (0.168)	0.061 (0.129)
<i>DVEARLY</i>	0.159 (0.233)	0.296* (0.170)		
<i>DVLATE</i>			-0.622** (0.263)	-0.443** (0.205)
Nebraska Dummy		72.65*** (11.32)		69.32*** (12.41)
R-Squared	0.532	0.761	0.505	0.713

Note: See text for variable definitions. Asterisks indicate significance at the 10%(*), 5%(**), and 1%(***) levels.

The third and fourth columns of Table 4 show the results of using late-period values of the rural share of the population and the Democratic share of the Presidential vote. It is interesting that the early-period quantities have (slightly) greater explanatory power. Adding the Nebraska dummy variable in the fourth column increases the explanatory power of the equation in the third column substantially and decreases the coefficient of *DVLATE*, which nonetheless remains significant at the 5% level.

It is surprising that the contemporaneous rural share has no explanatory power in either column 3 or column 4. Even if the geographic scope of rural cooperatives in each state was largely fixed in the early 1950s, one would have thought that the fraction of the population in rural areas in 2010 would affect the coop share of retail sales and thus the total non-IOU share. While the first two columns in Table 4 provide at best weak evidence that early-period blue states were more likely to rely on non-IOU distribution, the last two columns provide strong evidence that late-period red states are more likely to do so—both because, as Table 2 shows, *FEDSHR* remains strongly negatively related to *DVLATE* and because, somewhat surprisingly, *DVLATE* has a significant negative coefficient even in the presence of *FEDSHR*.⁴⁵

Table 5 shows that, as above, at least part of the explanation for these results is the change in the political map between early and late periods, combined with institutional inertia. Table 5 shows that the 20 states in which IOUs dominated retail sales in 2010 were more Republican than average in the early period but more Democratic than average in the later period. Thirteen of them became bluer, with the Democratic share increasing by more than 10 percentage points in four. On the other hand, the 28 that made heavier use of non-IOU distributors were bluer than average in the early period but became redder than average in the late period. Nineteen of these states became redder, and in 11 of these the Democratic share of votes for President fell by more than 10 percentage points. It is thus not that red states have come to dis-favor IOUs; it is rather that states that relied heavily on non-investor-owned

⁴⁵ The correlation between *DVEARLY* and *NIOU* is 0.24, and the correlation between *DVLATE* and *NIOU* is -0.41. It is not implausible that the fact that more rural states tended to be bluer in the early period increased the Roosevelt administration's enthusiasm for subsidizing rural electrification: the correlation between *DVEARLY* and *RU1950* is 0.33. The ensuing change in the political map has reversed this relationship: the correlation between *DVLATE* and *RU2010* is -0.33.

distributors in the 1950s, many of them blue states, continued to do so in 2010 even as on average they became redder. As at the national level, interest has trumped ideology.

Table 5. Changes in state-level political preferences v. *NONIOU*

	Mean			Number of Changes	
	<i>DVEARLY</i>	<i>DVLATE</i>	Change	Positive	Negative
All States	53.33	49.06	-4.27	22	26
<i>NONIOU</i> <20	49.83	52.27	2.44	13	7
20< <i>NONIOU</i> <40	56.69	47.81	-8.88	7	12
40< <i>NONIOU</i>	54.02	44.53	-9.49	2	7

Note: See text for variable definitions.

IV. CONCLUSIONS

The federal electric utilities and their service territories were largely defined by the Democratic administrations of Roosevelt and Truman. The higher a state's Democratic vote share in the 1932 and 1952 Presidential elections, the more likely it was to be served by a federal utility and thus to benefit from the subsidies that utility received. The more important hydroelectric generation is in a state within any federal utility's service territory, the greater that utility's share of total sales in that state.

Because the federal utilities sell their subsidized power preferentially to municipal utilities, rural cooperatives (themselves the recipients of federal subsidies) and other non-investor-owned public enterprises, the more important the federal utilities are in any state, the greater the incentive to rely on non-IOU electricity distributors. And, empirically, the more important are the federal utilities in any state, the more important are non-IOU distributors.

Between the early 1932-1950 period and a more recent period around 2010, the political map of the United States shifted dramatically; the correlation between the Democratic shares of votes for President in the two periods is -0.37. The scope of the federal utilities underwent no such dramatic shift, however. States not served by the federal utilities—and thus contributing to their subsidies—were redder than average in the early period and bluer than average recently, while the reverse held for the states that benefitted from those subsidies.

At the state and local level, distribution utility ownership patterns established in part in response to the incentives provided by federal programs seem also to have remained relatively stable despite dramatic changes in the political map. As a consequence, by 2010 the more

Republican a state's voting record, the more use it made on average of public enterprises to distribute electricity, even holding constant the importance of federal utilities in that state.

At least in part because it is generally difficult to pass legislation that would produce diffuse benefits and concentrated costs, the federal utilities, their preference clauses, and subsidies for rural electric coops have endured for well over half a century, despite huge changes in the U.S. political map. It is interesting that these government enterprises and subsidy schemes, which seem to have been established in part to benefit blue states at the expense of red ones, now tend to benefit red states on balance and are accordingly defended when necessary by Republicans, members of a party that has been increasingly hostile to "big government" in recent years. Democrats have become the (rather weak) proponents of privatization. Ideology is sometimes a powerful determinant of policy positions, but, as here, economic interests are often even more powerful.