

PUBLIC CAPITAL AND THE STATE-LEVEL VARIATION OF NEW DEAL EXPENDITURES

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For more than three decades, scholars have examined the grossly unequal state-level per capita distribution of New Deal spending. Why did small population rural states such as Nevada, Montana, and Wyoming receive up to six times as many federal dollars per capita as densely populated states such as Connecticut, Rhode Island, and New York? Empirical studies employing economic and political variables have had mixed results in explaining this distribution. What past studies neglect is that a large proportion of New Deal dollars went towards the creation of public goods, which had spillover effects particularly upon those who lived in close proximity to these projects. This paper suggests that the state-level distribution of per capita expenditures during the 1930s is consistent with what would be expected to follow from an economically efficient allocation of public goods.

The past few years have seen a crescendo of interest in reexamining the economics and politics of the New Deal.¹ Recent literature regarding the New Deal political economy highlights the strong inverse correlation between per capita spending and state population size and density. States with small populations, and particularly those that are sparsely populated, such as those in the Mountain West (e.g. Montana, Wyoming, and Nevada) received up to *six times* as many federal dollars per capita as New England states with large and/or dense populations such as New York, Rhode Island, and Connecticut.

Public choice interpretations, starting with Gavin Wright, have examined potential political causes for this regional distribution.² For example, the aforementioned

Mountain West states tended to be “swing states” whose electoral votes were generally among those most “in play” for presidential elections. Additionally, small population states have, by construction, the most electoral votes per capita since they have more senators per capita, an important measure in public choice studies of congressional influence.³ While such political factors may account for some of the unequal distribution of federal expenditures per capita, it does not seem plausible that such behavior alone, or even in conjunction with economic need-based factors such as unemployment rates, could cause a state such as Nevada to receive around \$1,500 per person while Connecticut received only \$237 per person. This paper offers a “spillover” explanation for the small population state bias—an expenditure bias that has been identified in studies of the post New Deal time period as well—but not, hitherto, in literature on the New Deal.⁴ Per capita spending involving the construction of spillover-creating public capital will necessarily be larger in small population states than in large population ones for any fixed level of per capita economic benefit. In fact, an efficient allocation of public goods generally requires higher per capita spending in small population states than in large population ones, as is consistent with 1930s expenditure patterns.

A Brief Overview of the Literature on the Distribution of New Deal Spending

A number of authors have examined the state-level dispersion of government expenditures between 1933 and 1939 to investigate whether politicians attempted to use the substantial increase in federal spending to “buy” votes in addition to, or instead of, relieving economic distress.⁵ For example, vote-buying could have been attempted by Congressmen working to direct federal projects to their home districts in order to please constituents. If this activity was common, one would expect to see states with more powerful Congressmen, as determined by factors such as tenure and appointments to key committees, to have enjoyed more success in securing such projects than those with less powerful representatives.⁶ Additionally, President Roosevelt could have used his influence to direct important projects to “swing-states,” i.e. those in which the winner of the state’s electoral votes was largely uncertain, in an attempt to increase his chances of reelection or to keep the Democratic Party’s coalition in place for his potential successor. The premise of this literature is that politicians try to bring their constituents projects that will enrich their lives so that constituents will, in turn, reward them with votes.

To test for the presence of vote-buying agendas during the New Deal, scholars have regressed federal spending per capita against political variables that represent factors cited above as well as economic variables such as the drop in per capita income and measures of unemployment.⁷ Given that much of this spending went toward the creation of spillover-creating public capital, however, per capita spending fails to provide full information on the benefits that spending provided (since per capita benefits are generally derived from *total* spending on public goods). This raises an important question: Assuming that the goal of any politician is to please his constituents, will he either try to bring home as many dollars as possible *regardless of their impact* or try to initiate federally funded projects that will have the most positive socioeconomic impact on constituents, *regardless of how much or little such projects cost*? The *quid pro quo* nature of the political economy literature clearly suggests that an assessment of the qualitative impact should be

of major importance. Without accounting for spillover effects, empirical tests of the vote-buying hypothesis using per capita spending can only assess the quantity of expenditures.

Public Capital and the New Deal

If New Deal expenditures consisted simply of transfer payments, an analysis of per capita spending to test for potential economic and political determinants of its statewide variation would be straightforward. Since a significant portion of this spending went toward spillover-creating public capital, however, the analysis becomes more complex. While New Deal expenditures have primarily been viewed in the context of a largely unsuccessful attempt to bring full employment via a Keynesian-style demand stimulus, economists have by and large ignored the potential supply-side effects of the New Deal in providing public capital.⁸ While clearly not all New Deal spending went to such projects during the 1930s, the expansion in economically beneficial public capital such as, roads, bridges, water and sewage systems, schools, hospitals, power plants, and airports is indisputable. The installed capacity of publicly-owned electricity-generating plants rose 55 percent between 1932 and 1939, while capacity of hydroelectric power rose 35 percent across the decade.⁹ Miles of surfaced roads on state highway systems increased 34 percent from 1930 to 1940.¹⁰ The number of municipal airports rose 42 percent between 1932 and 1938.¹¹ The construction of new schools enabled a 50 percent boost in enrollment in public high schools from 1930 to 1940.¹² Hospital capacity rose 35 percent between 1933 and 1942.¹³ Although the economy languished well below full employment throughout the 1930s—and there can be no doubt that a great deal of New Deal spending went to “leaf-raking” projects that brought no spillover benefits—the stock of public capital boomed due to a series of government re-employment projects entailing the construction of such investments.

Evaluation of the relative welfare gains brought about by New Deal expenditures using per capita spending is problematic.¹⁴ Public capital projects are generally, at least to some extent, non-rival and/or non-excludable. Multiple people, and in some cases, the entire population, may benefit from the production of projects. Furthermore, Aschauer, Deno, Munnell, Barro, and Easterly and Rebelo, among others, showed that public capital investments significantly increase the rate of return to private capital investments.¹⁵ To the extent that private productivity is increased, income and welfare in the vicinity of the public capital will rise. This implies that public capital projects could have helped speed up recovery from the Great Depression in the areas that benefited from such projects beyond any Keynesian-style demand stimulus that those dollars could theoretically have provided. Similarly, public capital can favorably influence the location of future economic activity and provides various non-pecuniary household benefits.¹⁶

Such spillover effects mean that measures of per capita expenditures on public capital yield biased welfare implications since the measured expenditures are divided equally among the state’s population but multiple members of that population may simultaneously realize the benefits of those expenditures. This may help shed light on why rural, small population states—where dollars were likely to have experienced relatively fewer spillover effects—received more federal expenditures per capita during the 1930s and have continued to receive more since.

Efficient Allocations of Public Goods

Past literature has focused primarily on divining the intent behind the distribution of federal expenditures while efficacy has been largely implicit in the background. Shifting the focus, what if New Dealers, intentionally or not, spent economically efficient amounts on public goods—that is the marginal benefits of spending were equal across all states and shifting any appropriation from one state to another would cause a net loss in aggregate welfare?¹⁷ What attributes would such an allocation amongst the states have? The law of diminishing marginal returns suggests that the benefits of each additional dollar spent would fall. Clearly, then, the marginal benefits of the first dollars spent creating public capital will be highest in highly populated areas, *ceteris paribus*, since this is where a spillover-producing project would generally provide the most “bang per buck.” Of course, highly populated states like New York received the most total New Deal spending, likely reflecting such efficiencies.

Now consider the marginal returns of per capita spending. Because of spillover effects, the marginal return on an additional dollar of total spending and an additional dollar of per capita spending are predictably incongruent. In particular, the marginal return on per capita spending on public capital is falls faster in highly populated areas than in lowly populated ones. This follows because, for any given amount of per capita spending, a high population state, by definition, has more total spending than a low population one. With respect to the production of perfectly non-rival public goods, it is the *total* quantity of spillover-creating goods, not the per capita quantity, that most correlates to benefits.

The end result is that, *ceteris paribus*, a high population state will generally reach its efficiency condition with fewer per capita dollars spent on spillover-creating public capital than a low population one. The per capita distribution of New Deal spending—with rural, small population states getting the most per capita—is perfectly consistent with economic efficiency given that much of this spending went to public goods.¹⁸

A Simple Two-State Example

Suppose, for the purpose of exposition, a state, “Small,” has a population of 100 and the federal government spends \$1,000, or \$10 per capita, on a perfectly non-rival public good that creates an average of \$20 of benefit to each citizen of Small (assume benefits do not spillover to other states). Suppose that another state, “Large,” with a population of 500 also receives \$1,000, in this case only \$2 per capita, for the creation of the very same public good, which also generates an average of \$20 of benefit to each of its citizens. Both of these states receive the same *per capita economic benefit* from the public good, an average of \$20, even though federal *per capita spending* is five times higher in Small than in Large.¹⁹ From a political economy perspective, the constituents of Small and Large should be equally pleased with the project secured for them, despite the large difference—a factor of five in this case—in per capita expenditures.

From here, consider the effect of an additional dollar spent creating non-rival public capital in the two states. The one-thousand and first dollar would clearly have more positive impact in Large, since five times as many people could generally benefit from the public capital’s creation. Clearly then, other factors constant, an efficient provision of public goods would have more total spending in Large than in Small. Following through on this logic,

suppose efficiency—where the marginal benefits of spending are equal in the two states—was reached at, say, \$4,000 of total spending in Large, and \$2,000 in Small. In per capita terms, Large receives \$8, while Small receives \$20. With respect to per capita benefits, however, citizens of Large are better off than those of the Small even though they received far fewer per capita expenditures. See the *Appendix* for a graphical analysis of this particular case and for more general support for the supposition that an efficient level of per capita spending on pure public goods will normally be higher in small population states.

Impure Public Goods and Population Density

Of course, the analysis carried out above is a simplification, as perfectly non-rival public goods, which have a similar impact upon everyone in a state—or average impact—are the exception rather than rule. Most public capital projects must be classified as impure, rather than pure public goods. In particular, spillovers from public capital such as roads, bridges, schools, libraries, and streetlights will generally create significant benefits only to those who live or work in the areas near them rather than equally to all citizens of the state. To the extent that depression-era public capital projects were associated with geographically limited spillovers, a state's population density would also have played a role—perhaps an even larger one than population size—in determining the potential economic benefits accrued from the creation of public capital.

Specifically, *ceteris paribus*, citizens in a densely populated state, such as Rhode Island, would have received more per capita economic benefit from a dollar spent on the creation of public capital than those living in a sparsely populated, rural state such as Wyoming or Montana. This is because it was likely that a greater number of Rhode Islanders lived in the vicinity of the capital. Following the logic above, per capita spending involving the creation of public capital is, then, is a downward biased measure of the additional economic welfare generated in densely populated states. Hence, one would generally expect to see densely populated states receiving fewer per capita expenditures on public capital than their rural counterparts, other factors held constant, if the aforementioned economic efficiency condition was even remotely approached.

A Spillover Effect Interpretation of Population and Land Variables Introduced in Recent New Deal Spending Literature

John Wallis introduced each state's inverse population—hereafter 1/POP—as a potential explanatory variable for per capita New Deal spending.²⁰ His reasoning was that “the federal government had to give some money to every state and that some programs, such as highway grants, were allocated on the basis of population.”²¹ Wallis finds that 1/POP is not only statistically significant at the one percent confidence interval, but that the variable alone accounts for over half the variation in per capita New Deal spending between 1933 and 1939. The smaller a state's population, the more per capita dollars it received. “Since small states have more electoral votes per capita and electoral votes per capita is an important component of several of the political variables, the statistical relationship between spending and political variables may be the result of arithmetic rather than behavior.”²² In brief, if 1/POP is included, an important omitted variables problem suffered by the previous literature appears to diminish.

Robert Fleck points out, however, that the coefficient on 1/POP should not be interpreted as apolitical because it is econometrically equivalent to that of senators per capita (2/POP)—a variable used in the public choice literature to test for congressional influence.²³ A reply to Fleck notes that, “The variable 1/POP represents lots of things. Some, like state flags per capita, have no meaning at all. You, the reader, may interpret 1/POP however you like.”²⁴

Fleck also introduces land per capita (LAND/POP), which is the inverse of the population density, as an explanatory variable because some New Deal spending formulas allocated funds, at least in part, on the basis of land. He finds that states with more land per capita received more per capita federal dollars and that the inclusion of LAND/POP (even when included in a regression with 1/POP) further diminishes the omitted variables problem. By including land per capita, Fleck claims his regressions, which have high *r*-squares and coefficients on the political and economic variables that are consistent with their predicted signs reveal “an empirical relationship that has eluded economists for over twenty-five years.”²⁵

If the land and population variables introduced by Wallis and Fleck are the panacea for the longstanding puzzle of what drove New Deal spending, the question of what effects the population and land variables are picking up becomes key. Some of the effects picked up by 1/POP and LAND/POP can surely be attributed to spending formulas as noted by Wallis. However, because a substantial proportion of New Deal spending went toward spillover-creating public capital, another reasonable interpretation of the coefficients on these variables exists. When either run on their own or, particularly when included in a regression together, 1/POP and LAND/POP are an excellent proxy for spillover effects (or lack thereof) provided by public capital. Small population states, particularly those with large amounts of land relative to their population, would have generally received the fewest spillover benefits per capita from public capital-creating projects, because fewer people likely lived in the spillover vicinity of the project. As established in the previous section, an efficient allocation of expenditures on spillover-creating public capital would generally entail states with high 1/POP and LAND/POP receiving the most per capita spending, other factors constant.

Table 1 lists the forty-eight states in order of their per capita allotment of New Deal spending between 1933 and 1939 and reports their inverse population (1/POP) rank.²⁶ Clearly, small population states such as those in the Mountain West stand out as the biggest winners in terms of per capita New Deal expenditures. Indeed, Wright notes that, “spending levels are so concentrated in the West that any variable which distinguishes the West is bound to be correlated with spending.”²⁷ However, because these states are also the ones where the spillover effects of public capital were generally the smallest, an efficient provision of spending is likely to have been larger, independent of whether politicians attempted to funnel these dollars to such states for political gain, to combat the economic effects of the Great Depression, or, most likely, both.

Table 1: Per Capita Spending, Inverse Population, and Inverse Population Density Rank

<i>State</i>	<i>Per Capita Allocation</i>	<i>Inverse Pop Rank</i>	<i>Least Dense Pop Rank</i>	<i>State</i>	<i>Per Capita Allocation</i>	<i>Inverse Pop Rank</i>	<i>Least Dense Pop Rank</i>
Nevada	1499.39	1	9	Illinois	364.88	46	40
Montana	986.30	10	2	Texas	361.70	43	14
Wyoming	896.91	2	1	Mississippi	358.18	26	24
Arizona	791.46	6	4	Maryland	344.82	21	42
Idaho	744.15	7	5	Tennessee	344.48	34	33
North Dakota	707.84	11	8	Oklahoma	342.66	27	17
South Dakota	701.61	12	7	Missouri	340.07	39	28
New Mexico	689.76	8	3	Maine	336.07	14	16
Utah	569.49	9	6	New York	334.81	48	44
California	538.10	44	22	Indiana	333.22	37	38
Nebraska	536.87	17	12	New Jersey	330.47	40	47
Oregon	535.66	15	11	Delaware	310.13	3	39
Washington	527.77	19	15	Alabama	309.78	32	29
Colorado	506.30	16	10	South Carolina	306.43	22	31
Iowa	466.70	29	23	Massachusetts	286.26	41	46
Kansas	434.30	20	13	Georgia	272.69	35	26
Minnesota	425.50	31	18	West Virginia	265.11	24	36
Arkansas	396.12	25	20	Pennsylvania	260.88	47	43
Vermont	390.49	4	21	Virginia	254.91	30	32
Wisconsin	390.26	36	30	Kentucky	251.04	33	34
Michigan	388.99	42	37	New Hampshire	247.76	5	27
Ohio	383.24	45	41	Rhode Island	246.56	13	48
Florida	377.21	23	19	Connecticut	236.92	18	45
Louisiana	369.88	28	25	North Carolina	227.55	38	35

Source: New Deal expenditures are from Reading. Population density was computed by dividing population by acres of land—both variables are from the 1940 Census.

In addition to reporting per capita New Deal spending and population rank, Table 1 reports the population density rank of each state with 1 being the least densely populated and 48 being the most. The correlation is striking. The nine least densely populated states are also the nine states that received the most per capita New Deal expenditures. Such a relationship would, in fact, be predicted when taking factors such as spillovers and impact into account—viewing federal expenditures in this context can seemingly add to our understanding of their distribution, both during the New Deal time period and after.

Regression specifications in Wallis, reprinted here in Table 2, which include as independent variables both Wallis’s inverse population measure and Fleck’s population density measure, confirm what is obvious from Table 1. While small population states received significantly more per capita New Deal expenditures, densely populated states, particularly those with more nonfederal land per capita (federal land per capita is insignificant), received significantly fewer New Deal dollars per capita. The r-squares indicate that, in fact, around 70 percent of the state-level variation in New Deal per capita expenditures can be attributed to these factors alone.

Table 2: New Deal Spending Per Capita Regressions from Wallis
(t-statistics)

	Wallis no. 3 (1)	Wallis no. 5 (2)
INTERCEPT	223.28 (10.94)	236.26 (10.78)
1/POP	78770100 (9.47)	77670907 (9.42)
POP/LAND	-0.24 (-2.35)	
POP/LANDfederal		0.00 (1.52)
POP/LANDnonfederal		-0.59 (-2.33)
N	48	48
R2	0.704	0.718
R2ADJ	0.691	0.699

Source: Table is recreated from John J. Wallis, "The Political Economy of New Deal Spending, Yet Again: A Reply to Fleck." *Explorations in Economic History* 38 (2001): 305-314.

A Brief Case Study: New York

New Deal spending in New York illustrates how the use of per capita spending on spillover-creating public capital greatly understates the economic impact of such expenditures in high population areas. With 10 percent of the nation's population, New York was far and away the most populous state and ranked fifth in population density (forty-fourth on the least densely populated scale). Although New York ranked first in total spending with close to \$4.5 billion, it ranked only thirty-third with respect to per capita New Deal spending with just under \$335. A sizeable portion of these expenditures went toward major public capital projects in the New York City metropolitan area such as the construction of La Guardia airport and the Triborough Bridge complex. Several million people in the nation's largest urban area were likely to have benefited, directly or indirectly (in the form of lower traffic congestion, increased rates of return to investment, and increased leisure time, for example) from the creation of public capital projects such as these.

Clearly the impact of public capital projects is understated by the use of per capita spending measures and this understatement is exacerbated in densely populated areas such as New York City, since the spillover effects associated with such projects were clearly larger there than in, say, New Mexico. This can help explain, alongside political and economic factors, why New Yorkers received relatively few per capita expenditures—less than half as many as citizens of New Mexico and the Dakotas and almost five times fewer than citizens of Nevada.

The state-level variation in per capita expenditures was dramatic during the New Deal—the first major peacetime expansion of federal spending in United States history—and, as such, has attracted a great deal of attention from economists and political scientists. Wallis colorfully noted that literature on New Deal expenditures, now well into its fourth decade, “depicts an econometric horserace” between political and economic variables.²⁸ This paper does not join that horserace, but instead offers a new explanation for past results. Far from being unseemly, the distribution, with small population states receiving more per capita spending than high and densely populated ones, is entirely consistent with an efficient allocation of expenditures on spillover-creating public goods. This follows from the fact that the marginal return on per capita spending, other factors constant, falls faster in high population states than low population ones.

A public goods perspective casts a very different light upon the fact that rural states such as those in the Mountain West typically received three to six times more New Deal expenditures per capita than densely populated states such as New York, Rhode Island, Connecticut, and Massachusetts—an expenditure pattern that has continued to hold up in more recent political economy studies showing that small population states generally receive larger per capita allotments. To the extent that public capital projects provide economically beneficial spillovers to those living near them, and to the extent that politicians attempt to secure future votes by maximizing the impact projects have on their constituents, such a state-level distribution of funds appears to be both economically and politically sensible. Further empirical work should examine the composition of state-level New Deal projects to determine more precisely the extent that expenditures in various states went to spillover-creating public capital rather than simply transfer payments such as agricultural subsidies or “leaf-raking” type projects.

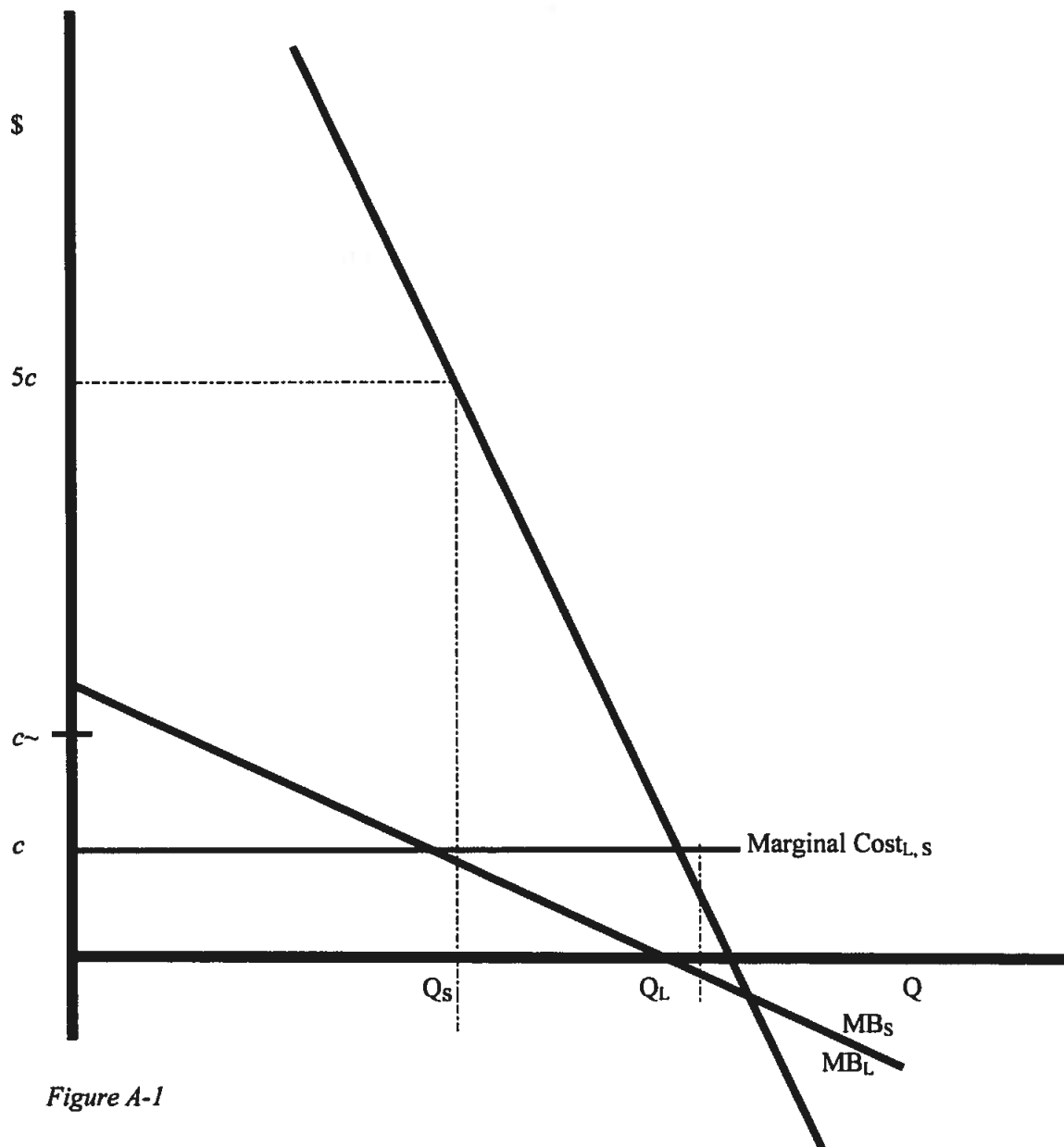
Appendix

Figure A-1 shows the corresponding marginal benefits of pure public goods in the case of two states described in the text, “Small” with population of 100 and “Large” with population of 500. Two properties of note are:

- (1) The marginal benefit equals zero (intercept of the X-axis) at the same quantity of pure public goods in both states. This follows by construction since we assume that the citizens of Large and Small have identical preferences such that the same Q^{th} unit of the pure public good provides no additional utility.
- (2) The marginal benefit curve of Large (MB_L) is always five times higher than the marginal benefit curve for Small (MB_S), for all positive marginal benefits. This follows because each unit of the pure public good provides the same average benefit to each citizen, and there are five times as many citizens in Large as in Small. Note that for this to be true, MB_L is sloped five times as steeply as MB_S , so that the marginal benefits of additional projects are falling five times faster in Large as in Small.

Given the properties described by (1) and (2), at any quantity of pure public goods, such as Q_S , the marginal benefit for Large (5c) is five times that for Small (c). Furthermore, for 167

any constant marginal cost of providing a unit of the pure public good, such as c , "Large" will always (assuming the equal-marginal definition of efficiency) receive a greater provision than "Small" so that $Q_L > Q_S$. However, since Large's population exceeds Small's by a factor of five, Small will have more *per capita* spending so long as Q_L is less than five times as large as Q_S ($Q_L < 5Q_S$). This will be true for all c below c^* . In summary, for any marginal cost below c^* , an efficient level of per capita spending on public goods will necessarily be higher in Small than in Large.



NOTES

We thank James Irwin and Ranjit Dighe for valuable comments. A shorter preliminary version of this paper was published previously in an on-line “letters” journal. Fred Bateman and Jason Taylor “Does the Distribution of New Deal Spending Reflect an Optimal Provision of Public Goods?” *Economics Bulletin* 8 (2007): 1-6.

1. This applies not just to academic literature, but to the mainstream press as well. See most recently, Amity Shlaes, *The Forgotten Man: A New History of the Great Depression* (New York: Harper-Collins, 2007) and Jim Powell, *FDR’s Folly: How Roosevelt and His New Deal Prolonged the Great Depression* (New York: Crown Forum, 2003).
2. Gavin Wright, “The Political Economy of New Deal Spending,” *The Review of Economics and Statistics* 59 (1974): 30-38.
3. For a recent example of the importance of senators per capita, see Cary. M. Atlas, Thomas. W. Gilligan, Robert. J. Hendershott, and Mark A. Zupan, “Slicing the Federal Government Net Spending Pie: Who Wins, Who Loses, and Why?,” *American Economic Review* 85 (1995): 624-629, who empirically demonstrate that states “overrepresented” in the Senate—that is small population states—secured significantly higher per capita expenditures between 1972 and 1990.
4. Ibid.
5. Leonard. J. Arrington, “The New Deal in the West: A Preliminary Statistical Inquiry,” *Pacific Historical Review* 38 (1969): 311-316; Donald. C. Reading, “New Deal Activity and the States,” *Journal of Economic History* 36 (1973): 792-810; John J. Wallis, “The Birth of Old Federalism: Financing the New Deal,” *Journal of Economic History* 44 (1984): 139-59; John J. Wallis, “Employment, Politics and Economic Recovery During the Great Depression,” *The Review of Economics and Statistics* 59 (1987): 516-520; John J. Wallis, “The Political Economy of New Deal Spending Revisited, Again; With and Without Nevada,” *Explorations in Economic History* 35 (1998): 140-170; John J. Wallis, “The Political Economy of New Deal Spending, Yet Again: A Reply to Fleck,” *Explorations in Economic History* 38 (2001): 305-314; Gary M. Anderson and Robert. D. Tollison, “Congressional Influence and Patterns of New Deal Spending, 1933-39,” *Journal of Law and Economics* 34 (1991): 161-75; James. F. Couch and William. F. Shugart II, *The Political Economy of the New Deal* (Northampton: The Locke Institute, 1998); James. F. Couch and William. F. Shugart II, “New Deal Spending and the States: The Politics of Public Works,” *Public Choice Interpretations of American Economic History*, eds. Jac. C. Heckelman, John. C. Moorhouse, and Robert. M. Whaples (Boston: Kluwer Academic Publishers, 2000), 105-22; Robert K. Fleck, “Electoral Incentives, Public Policy, and the New Deal Realignment,” *Southern Economic Journal* 65 (1999): 377-404; Robert K. Fleck, “Population, Land, Economic Conditions, and the Allocation of New Deal Spending,” *Explorations in Economic History* 38 (2001): 296-304; Price V. Fishback, Shawn Kantor, and John J. Wallis, “Can the New Deal’s Three Rs be Rehabilitated? A Program-by-Program, County-by-County Analysis,” *Explorations in Economic History* 40 (2003): 278-307 explores similar questions using county-level data.

6. James. T. Bennett and Eddie. R. Mayberry, "Federal Tax Burdens and Grant Benefits to States: The Impact of Imperfect Representation," *Public Choice* 34 (1979): 255-269 is an early example of an empirical finding that tenure of congressional representatives is important. They find that for an average citizen, re-electing an incumbent senator is worth \$45, *ceteris paribus*.
7. Wallis, "The Political Economy of New Deal Spending Revisited" notes that political and economic factors were complementary—alleviating economic distress was good politics—making such analysis still more complex.
8. Alexander J. Field, "The Most Technologically Progressive Decade of the Century," *American Economic Review* 93 (2003): 1399-1413, is an exception. He notes, "although insufficient in terms of its influence on aggregate demand ... public investment nevertheless had significant impacts on the supply side" (p. 1408).
9. Power capacity statistics are from the 1940 *Statistical Abstract of the United States*, tables 444 and 457.
10. *Statistical Abstract of the United States*, 1943, table 484.
11. *Statistical Abstract of the United States*, 1940, table 514.
12. *Statistical Abstract of the United States*, 1943, table 231.
13. The data point for 1933 is from the *Journal of the American Medical Association* (1934), page 1009, and the 1942 data point is from the *Statistical Abstract of the United States* (1943), table 87.
14. Not to say that this is the primary objective of past New Deal political economy studies. Such studies have generally been attempting to measure the responsiveness of federal spending to political and economic variables, rather than the impact of that spending. The purpose here is to offer impact as a potential explanation for the general weakness of political and economic variables in capturing the variation in New Deal spending.
15. David. A. Aschauer, "Government Spending and the Falling Rate of Profit," Federal Reserve Bank of Chicago, *Economic Perspectives* 12 (1988): 11-17; David. A. Aschauer, "Is Public Expenditure Productive?," *Journal of Monetary Economics* 24 (1989): 177-200; David. A. Aschauer, "Do States Optimize? Public Capital and Economic Growth," *Annals of Regional Science* 34 (2000): 343-363; Kevin. T. Deno, "The Effect of Public Capital on U.S. Manufacturing Activity: 1970 to 1978," *Southern Economic Journal* 55 (1988): 400-411; Alicia. H. Munnell, "How Does Public Infrastructure Affect Regional Economic Performance?," *Is There a Shortfall in Public Capital Investment?*, ed. Alicia. H. Munnell (Boston: Federal Reserve Bank, 1990); Barro Robert. J., "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics* 106 (1991): 407-443; William Easterly and Sergio Rebelo, "Fiscal Policy and Economic Growth," *Journal of Monetary Economics* 32 (1993): 417-458.
16. Andrew F. Haughwaut, "Public Infrastructure Investments, Productivity and Welfare in Fixed Geographic Areas," *Journal of Public Economics* 83 (2002): 405-428.
17. This definition of efficiency says nothing about "global efficiency." It does not presume that New Dealers necessarily spent the efficient amount on public goods for the entire economy. Rather it examines efficiency for any given total allocation of public goods in the United States. The analysis in this paper is independent of whether or not global

efficiency is met.

18. Incidentally, the same logic can be applied to an “efficient” quantity of politically motivated spending. Again the law of diminishing marginal returns applies to such spending. Because of spillover effects from public capital projects, diminishing political returns on total dollars spent and per capita dollars are, once again, unequal. As with before, the returns on per capita dollars diminish more rapidly in high population states, so high population states generally require fewer per capita expenditures to reach a reasonable measure of “political efficiency.”
19. Another way to view this is that the *total* benefits are five times higher in the large population state than the small given the same level of *total* spending.
20. Wallis, “The Political Economy of New Deal Spending Revisited.”
21. Ibid, 168.
22. Ibid, 142.
23. Fleck, “Population, Land, and Economic Conditions.”
24. Wallis, “Political Economy of New Deal Spending, Yet Again: A Reply to Fleck,” 307.
25. Fleck, “Population, Land and Economic Conditions,” 302.
26. Population data are from the 1940 US *Census*.
27. Wright, “Political Economy,” 34.
28. Wallis, “Political Economy of New Deal Spending, Yet Again: A Reply to Fleck.”

