IN SEARCH OF THE MULTIPLIER FOR FEDERAL SPENDING IN THE STATES
DURING THE NEW DEAL

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ABSTRACT

If there was any time to expect a large peace-time multiplier effect from federal spending in the states, it would have been during the period from 1930 through 1940 when unemployment rates never fell below 10 percent and there was ample idle capacity.   We develop an annual panel data set for the 48 continental states from 1930 through 1940 with evidence on federal government grants, loans, and tax collections and a variety of measures of economic activity. Using panel data methods we estimate a multiplier, defined as the change in per capita economic activity in response to an additional dollar per capita of federal funds. For personal income, which includes transfer payments as income, the estimate ranges from 0.91 for the combination of government grants and loans to 1.39 when only grants are considered. It is important to distinguish between the effects of farm subsidies and the combination of public works and relief grants. The personal income multiplier for public works and relief was around 1.67, while the effect of farm payments to take land out of production reduced personal income by 0.57. Multipliers for a more production-based measure of state income per capita after removing nonwork relief transfers and adding back payroll taxes are about 10 to 15 percent smaller. The multiplier for wages and salaries was substantially less than one, as was the multiplier for retail sales. The impact of the federal spending on employment was negligible and may have been negative.   The results may help explain why measures of income have recovered more rapidly than measures of employment in both the 1930s and in the current era.

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In Search of the Multiplier for Federal Spending in the States

During the New Deal

In response to the recession of 2007 to 2009 the U.S. federal government adopted a sizeable fiscal stimulus package. When added to the budget problems from 2008 and additional spending in President Obama's first budget, the federal government's budget deficit as a share of GDP has risen to around 10 percent of GDP in 2009 and 2010. The current deficit relative to GDP has reached its highest level since World War II, when the U.S. was a command economy engaged in all-out war. The 2009 stimulus package and new calls to stimulate again have revived interest in output multipliers associated with fiscal policy. Over the past two years a range of multipliers have been suggested. Mark Zandi (2009) of Moody's Economy.com suggests a general multipler near 1.5, and specific multipliers that range from 1.13 for energy assistance grants to 1.74 for temporary increases in food stamps (Blinder and Zandi, 2010, 16). Christina Romer has provided modern estimates of fiscal multipliers in the 1 to 3 range (Romer 2009, Romer and Romer 2006, and Romer and Bernstein 2009). On the other hand, Robert Barro (2009, 1981) and Barro and Charles Redlick (forthcoming 2011) find short-run multipliers of less than one, as do Cogan, Cwik, Taylor, and Wieland (2009). Valerie Ramey (forthcoming 2011) finds intermediate ground with multipliers ranging from 0.6 to 1.2. The regional science literature and various economic forecasters, including Zandi (2009), also offer a wide range of multipliers for states, regions, and communities.[1]

We estimate a series of multipliers for federal fiscal activity in the 48 continental states during the period 1930 to 1940. The period was chosen because unemployment

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[1] Estimates of multipliers for a broader range of countries include Kraay's estimates of low multipliers in lesser developed countries.

rates were between 9.5 and 25 percent throughout those years. Given the large number of unemployed resources, it seems likely that fiscal stimulus during this period would be least likely to lead to crowding out of private activity; therefore, the estimates would be the highest estimates for the multiplier that anyone would anticipate.

Although the New Deal deficits at the national level were not large enough relative to the economic problems to be considered a true Keynesian stimulus, there was considerable variation in spending and tax revenues per capita at the state level (Brown 1956; Peppers 1973; Fishback, forthcoming). Figure 1 shows that real federal tax revenues per capita (in 1967$) in 1935 ranged from $3 in Mississippi to $321 in Delaware and federal grant spending per capita ranged from $46 in Rhode Island to $506 in Nevada. We have compiled a data set of the key components of federal spending and loans identified by the U.S. Office of Government Reports (OGR) between 1933 and 1939. Starting with the OGR data we then checked the spending in each category from 1933 and 1939 and then extended the data forward to 1940 and backward to 1930 using reports of the U.S. Treasury and many federal agencies.

The data are matched with information on state personal income, wage and salary income, retail sales, automobile registrations, and payroll and employment information for a broad range of employment and for manufacturing. State personal income includes transfer payments because it is designed to measure purchasing power for consumers (Cone 1940, pp. 3, 10, 13); therefore, part of the federal fiscal multiplier for state income is a direct pass through of transfer payments. Multipliers estimated for the other measures offer information about how federal spending influenced private incomes and consumption. Another reason to examine other measures is to reduce problems with

measurement error that arose because the analysts who aggregated the data had to perform extensive interpolations on the nonwage portions of income. Measures with no interpolation include the annual estimates of payroll and employment from the Bureau of Labor Statistics, automobile registrations, manufacturing census data on payrolls and employment from the odd years between 1929 and 1939 and information from the retail census on retail sales from 1929, 1933, 1935, and 1939.

In estimating the multipliers, we use several different measures of federal spending. In addition to federal grants, the federal government distributed a significant number of loans with a broad range of repayment provisions. Some of these loans began to resemble grants given the dearth of private lending in the 1930s and delays in repayment in the federal loans.   Differing purposes for specific grants also suggest that it is important not to lump all grants into one category. For example, the Agricultural Adjustment Act payments to farmers to take land out of production were explicitly designed to reduce output and raise farm prices.

We also deal with national government taxation in two ways. The national tax code set the same rates throughout the country in any one year, so year fixed effects are used as one control. Different structures of industry and consumption, however, might cause the tax rates to have varying impacts on revenue collection in the states; therefore, multipliers for federal spending net of federal tax revenues are also estimated.

The multipliers are estimated using controls for time-varying weather patterns in the states, state fixed effects, year effects, and state-specific time trends, as well as instrumental variable techniques. Results from other studies of the New Deal and comparisons of results with and without instrumental variables suggest that there was a

strong negative endogeneity bias when instruments are not used because the federal government distributed more funds to areas during times when the economy was declining. After instrumenting for federal spending, an additional dollar of federal grants per capita increased per capita personal income by $1.39 after controlling for state and year fixed effects. When loans are included as federal spending the multiplier estimate falls to 0.86 with state and year fixed effects. The multiplier for federal grants net of federal tax revenues in the state was 1.08. The state income multiplier for grants aside from AAA grants was in the range of 1.67, while the multiplier for AAA grants was negative but statistically insignificant. Multipliers for a measure of state income that removes nonwork relief transfers are about 10 to 15 percent smaller. In contrast, federal spending had no positive and potentially negative effects on broad measures of private employment and payrolls.

Background.

In response to the hard times between the fiscal years 1929 and 1933, the Hoover administration and Congress increased nominal government spending by 52 percent, 88 percent after adjusting for the tremendous deflation.[1] By fiscal years 1932 and 1933 the federal government was running a deficit of -4.7 percent of a much reduced GDP as growth in tax revenues failed to keep pace with the rise in government spending. The sizeable tax rate increase of 1932 was followed by a substantial drop in *income* tax revenue for fiscal 1933. The drop in income tax collections was roughly offset by revenues from new excise taxes on cars, oil pipelines, gasoline, fuel oil, electricity, and some other products.

After Franklin Roosevelt and the new Democratic Congress took office in March 1933, government spending doubled over the next 6 years. The rise in spending did not lead to large budget deficits because tax revenues rose at roughly the same rate. The recovery led to more income tax collections, but a sizeable share of the rise in revenues came from additional collections on the new excise taxes and the renewal of collections of taxes on alcoholic beverages after the end of Prohibition.

E. Cary Brown (1956) and Claude Peppers (1973) have documented that the federal deficits as a share of GDP were small and fell well short of being Keynesian policies designed to stimulate the economy. On the other hand, the distribution of the federal spending varied enormously across states on a per capita basis. The federal tax burden from the spending also varied greatly as well. Figure 1 shows the large variation across states in 1935 in per capita federal grant spending and per capita federal tax receipts in 1967 dollars in each state.[2] The extent of the variation is similar across other years.

Fiscal Multipliers

Macro Multipliers

Government administrators under Hoover and Roosevelt talked about multipliers, although not in the context of a macroeconomic model. The Department of Agriculture (1932, 49-50) reported on the Hoover administration's increase of highway spending as a a relief and stimulus measure: "Emergency employment was directly provided for varying periods for nearly 200,000 men and indirectly for a much larger number in industries supply necessary materials and services." In 1935 the U.S. Bureau of

Agricultural Economics traced the path of $100 million of highway spending through the economy until it was paid out as wage or salary income and calculated highway spending multipliers of 2.7 for employment and 3 for economic activity.

In the 1970s and early 1980s macroeconomics textbooks reported on estimates of the Keynesian multiplier. For example, the third edition of Dornbusch and Fischer's *Macroeconomics* in 1984 (p. 148) reports multiplier estimates for an increase in net government spending of 1.8 from DRI and 0.7 from the Federal Reserve Bank of St. Louis. Meanwhile, the macroeconomics literature was shifting direction. Hall (1980) argued that temporary government purchases that are not close substitutes for private spending could stimulate the economy by shifting production forward in time but long run increases would not. Robert Barro (1981) found that the effect of temporary military spending on consumption exceeds that of permanent military spending; furthermore, non-military spending, not divided into permanent and temporary, did not have any significant effect. In late 1980s and 1990s the early works of Barro and Hall were extended by using mostly one-sector neoclassical growth models with constant return to scale to estimate fiscal policy multipliers.

Changes in assumptions can lead to quite different effects. In contrast to Barro and Hall, Aiyagari, Christiano, and Eichenbaum (henceforth ACG) (1992) argued that fiscal changes could affect long run interest rates and then show both theoretically and empirically that the impact on output, employment and the interest rate of a persistent change in government consumption exceeds that of a temporary change. Devereux, Head and Lapham (1996) modified the commonly used model by assuming imperfect competition and increasing returns to scale. They found that government spending could

lead to an increase in factor productivity that lowered real wages, raised firm profitability, and could lead to a stimulus to rather than a crowding out of private investment.

A series of VAR studies of the macro-economy sought to resolve endogeneity problems by relying on military build-ups that were said to be unrelated to the state of the economy or to narratives where it appears that there were no attempts by the government to respond to economic conditions. Blanchard and Perotti (2002) offer a nice summary of the literature to that time and find that private consumption is consistently crowded out by taxation and crowded in by government spending, consistent with the Keynesian model. On the other hand, private investment is crowded out by both government purchases as well as taxation, which is consistent with the neo-classical model.[3] Using a vector auto-regressive framework Afredo M. Pereiral and Rafael Flores de Frutos (1999) found that public spending crowds out private spending, leading to multipliers of about 0.65.[4] Ramey and Shapiro (1998) develop a two-sector dynamic general equilibrium model in which the reallocation of capital across sectors is costly. The two-sector model leads to a richer array of possible responses of aggregate variables than the one-sector model. The empirical part of the paper estimates the effects of military buildups on a variety of macroeconomic variables and leads to a wide range of findings, some counter to the literature, some consistent with Keynesian models, and all consistent with their model.

The recent increased focus on the stimulus package has led to a wide range of estimates. Alan Blinder and Mark Zandi (2010, pp.) has used the Moody's Economy.com simulation model to report a range of macroeconomic multiplier estimates

for different programs from 0.31 for cuts in corporate taxes to 1.73 for temporary increases in food stamps. But they treat most government spending (aside from automatic stabilizers like unemployment insurance and welfare payments) as exogenous, an assumption that has not been accepted in the literature on government spending in academia for a very long time.

All of the academic papers seek ways to resolve problems with omitted variable bias and endogeneity bias in government fiscal policy. Christina and David Romer (2006) uses narratives to isolates tax changes uncorrelated with other factors affecting output and find that tax cuts can raise GNP by multiples of 2 or 3 over a three-year period (Romer and Romer 2006, 43). Cogan, Cwik, Taylor, and Wieland (2009) have run simulations based on a new Keynesian model and found multipliers less than the 0.8 estimates found by Barro for World War II.

Recent work by Ramey (forthcoming 2011) and Barro and Redlick (forthcoming 2011) use a new method to identify exogenous changes in government spending. Ramey uses *Business Week* and other newspapers to construct an estimate of changes in the expected present value of government spending. She finds estimates of a multiplier for this variable of one when World War II is included in the sample, and between 0.6 and 0.8 when World War II is excluded. She also constructs a forecast error variable for professional forecasters and finds that shocks to this series imply that temporary rises in government spending lead to declines in output, hours, investment, and consumption. defense news variable for the modern period. Barro and Redlick use Ramey's defense news variable and find that temporary defense spending has a multiplier of 0.5 or less

over one year and 0.7 or less over two years. Permanent shocks to defense reach a maximum of 0.9.

In the economic history literature Christina Romer (1992) estimated fiscal and monetary multipliers for the 1920s and 1930s using a simple equation where

$$Output\ Change_t = \beta_M\ (Monetary\ Change)_{t-1} + \beta_F\ (Fiscal\ Change)_{t-1} \quad 3)$$

She argues for a year lag in the impact of policy and then picks two years where she could plausibly argue that monetary and fiscal policies were not designed to offset declines in the real economy. Romer picks output years 1921 and 1938 and thus policy years 1920 and 1937. In both cases she argues that Federal Reserve policy was independent and not focused on the economy. There was much less federal spending in 1937 than in 1936 because of the one-time payout of the veterans' bonus. After plugging values in for these two years she finds a monetary multiplier of 0.823 that is much larger in magnitude than the fiscal multiplier of 0.233.

Alumnia, et. al (2009) use information from 27 countries during the 1920s and 1930s to assess the effect of fiscal and monetary policies during the period. Using a panel VAR and defense spending as their measure of fiscal stimulus, they find a very strong fiscal multiplier of 2.5 on impact and 1.2 after one year. However, most countries did not run strong stimulatory fiscal policies during the period.

Regional Multipliers

On the state and regional level studies of fiscal activity have found mixed results. Cohen, Coval, and Malloy (2010), in a paper closest in spirit to our own, use changes in federal spending related to changes in key Congressional committee assignments to show

that increases in federal spending are associated with reductions in private investment and employment in the states. Hulten and Schwab (1991) conclude that the link between public infrastructure and states' economic growth is weak, as the states that expanded public infrastructure the most in the 1970s were not the ones that developed faster during that period. On the other hand, Munnell (1992 192), Garcia-Mila and McGuire (1992), Costa, Ellison, and Martin (1987), Blanchard and Katz (1992), Duffy-Deno and Roberts (1991), Fernald (1991), and Aschauer (1989) find positive effects of public spending on a variety of dimensions.[5]

Meanwhile, regional scientists, business economists, and regional forecasters have been active in developing models of multipliers that they apply to government spending and other types of income coming into a location. Mark Zandi's (2009) makes predictions about the impact of the new fiscal stimulus package on state employment. Regional scientists have developed a broad range of theoretical models that lead to multipliers for net income coming into the region. The models range from the early Keynesian regional models to input-output models to economic base models to neo-classical models.[6] The empirical work on regional multipliers led to a broad range of estimates of multipliers of between 0.5 and 2 depending on the technique used. Some rely on simulations that derive multipliers using input-output models and surveys that describe the degree to which different industries rely on local labor and external inputs and capital. Others rely on Ordinary Least Squares regression estimates (Mulligan (2005, 1987).

There have been some estimates of the impact of New Deal spending on general economic activity. Fishback, Horrace, and Kantor (2005, 2006) showed a strong positive

influence of public works and relief spending on county-level retail sales and net-migration. At the same time spending by the Agricultural Adjustment Administration (AAA) had a slightly negative effect on retail sales growth and net migration. Garrett and Wheelock (2006) found similar positive effects of overall New Deal spending in a cross-sectional analysis of the growth rate in state personal income per capita for the entire period 1933 to 1939 and New Deal spending during that period. However, neither the Fishback, Horrace, and Kantor estimates nor Garrett and Wheelock estimates show a short-term fiscal multiplier because they examine the impact of spending over a six-year period on retail sales per capita at the end of the decade.

Studies of labor markets in the 1930s have focused on the impact of relief spending on labor markets. Neuman, Fishback, and Kantor (2010) examine monthly data from 1933 through 1940 for over 40 cities and find that relief spending raised private employment through 1935 but reduced it afterward. Benjamin and Mathews (1992) find small crowding out effects of private employment from relief jobs in through 1935 and much larger crowding out effects in the second half of the New Deal.[7]

Measures of Economic Activity

The impact of federal spending is estimated for several measures of economic activity. The broadest measure is state personal income per capita, which has been estimated and reported by the Bureau of Economic Analysis since the 1930s. All papers that examined the distribution of income across states cited the BEA articles on monthly personal income in discussing sources. Frederick Cone (1940, 3, 10, 13, 39), who helped develop the early estimates, described personal income as a measure of the "ability of

consumers to purchase the new goods and services currently produced by business enterprises." With that in mind personal income was defined as national income after subtracting business savings, social security contributions from employer and employee, contributions to the Railroad Retirement Fund, and contributions to retirement systems for government employees on the grounds that these were not available for spending. To capture purchasing power, the BEA added back many transfer payments, including direct and work relief, federal pensions to veterans, adjusted service benefits (both loans in the early 1930s and the Veterans' Bonus), other government retirement allowances, unemployment compensation, railroad insurance benefits, old-age insurance benefits, and agriculture benefit payments.[8] Direct relief accounted for about 1.4 percent, retirement payments for veterans and federal workers accounted for about 1 percent, and the World War I adjusted service certificates payouts reached peaks of 1.4 percent of income (in the form of loans) in 1931 and 2.1 percent (in the form of cash) in 1936 with negligible amounts in between (Cone, 1940, 10, 24-5).

Since most of the literature on multipliers works with measures of GDP that would not include transfers, we have developed an estimate of income per capita that substracts transfers without a work relief component and adds back payroll taxes for social insurance and contributions to government pension plans. This is a more production based measure of income. Work relief is treated as production income because it was related to production. Since we are not privy to the exact sources used to construct personal income, there is a risk of adding measurement when we make the adjustments.

We have also estimated the model with measures of wage and salary income net of payroll taxes and several other measures of economic activity.[9] The wage and salary income, which is net of pay-roll deductions for social insurance, accounted for about 62.5 percent of personal income in the 1930s (Martin and Creamer, 1942, p. 23). Measurement error is also an issue with the wage and salary income personal income data because the information on some components had to be interpolated between census years and from scattered components. The most accurately measured information is the wage component of wage and salary income because it relies heavily on the monthly establishment surveys collected by the Bureau of Labor Statistics during this period. The BLS suggested that about 48 percent of employment was covered by the survey in 1938 (Cone, 1940, 31).

To further reduce problems with measurement error and also examine in more depth where the stimulus occurred, we examine several other series: census reports on manufacturing payroll per capita in the odd years from 1929 through 1939, and the retail census estimates of per capita retail sales for the years 1929, 1933, 1935, and 1939. These two measures are particularly valuable because they are based on nationwide censuses of all establishments. There are several additional measures of income and spending that are not available in dollar terms, including per capita measures of John Wallis's (1989) broad-based employment index built up from BLS employer surveys for 1929 through 1939,[10] newly computerized payroll indices for 1932 to 1939 for the same group of industries, and per capita auto registrations, to capture the effect of government spending on a major consumer durable. The employment and payroll indices rely very little on interpolation but there may be sampling error in each state because the series are

based on month-to-month comparisons of the same employers from surveys that rotate

employers out of the sample (Wallis, 1989; Neumann, Fishback, and Kantor 2010).

Wallis (1989) used benchmarks to resolve some of these problems for the broad-based

employer index, but the payroll indices have not been benchmarked. The automobile

registrations also are measured well, as the states collected license revenue from the

automobiles.

Federal Fiscal Activity in the 1930s

Understanding of the impact of federal spending and taxation during the New

Deal era is complicated by the great diversity of programs. The New Deal funding

programs were divided into the two major classifications: nonrepayable grants and

repayable loans.[11] The Office of Government Reports (OGR) (1940) reported the total

amount spent by each program in each state in each year between July 1, 1932 through

June 30, 1939. The OGR mimeos do not document where they obtained the spending

figures by state. To double check the OGR data and extend the series for programs back

to 1929 and forward to 1940, we went through a large number of reports from various

agencies and the Treasury department to find the original sources. The data appendix

describes the sources we used and some of the inconsistencies we found. In addition, we

added information that the OGR did not report on the construction and maintenance

spending on Hoover (Boulder) Dam and the Tennessee Valley Authority (TVA) and the

loans and cash grants on the World War I adjusted service certificates that were

associated with the Veterans' Bonus. The totals and the amounts per capita for the period

1933 through 1939 are reported in Table 1 to get a sense of the size of each program.

The main focus in the analysis is on nonrepayable grants from the federal government. About 62 percent of the grants were associated with relief programs. All of the Works Progress Administration (WPA), Civilian Conservation Corps (CCCG), and Civil Works Administration (CWA) grants and roughly half of the Federal Emergency Relief Administration (FERA) were spent on poverty relief projects with work requirements and could be considered federal expenditures because they produced a good or service. The Social Security Act Programs (SSA), and the rest of the FERA grants were New Deal programs that offered transfer payments to alleviate poverty. The Veterans' Administration (VA) and Soldiers' and Sailors' Homes (SOLD) were grant programs in place before the New Deal that provided pensions, disability payments, and living support to military veterans. Grants from the SSA programs provided matching grants to states that provided aid to dependent children (ADC), old-age assistance (OAA), and aid-to-the-blind (AB). If we performed the analysis for the U.S. as a whole, the transfer payments from the SSA, part of the FERA, the VA, and the SOLD, which account for roughly 20 percent of the grants, would not necessarily be treated as expenditures because they are net transfers within the system. However, at the state level these transfer grants become income that influence purchasing power within each state and we therefore incorporate them into the analysis.

The second major grant category is public works programs, which accounted for 19.4 percent of the grants. The Public Works Administration Federal (PWAF) and Nonfederal (PWANF) programs, Public Roads Administration, Public Buildings Administration (PBA), Rivers and Harbors Grant (RH) and other smaller programs listed as public works in the table were not poverty programs. All but the PWA programs were

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long run federal programs established before the New Deal. Unlike the work relief poverty programs, the public works programs could hire from the labor market or the relief rolls, faced no restrictions on hours worked to limit the amount received by an individual, and paid hourly wages that were roughly double those on the work relief programs.

Approximately 12 percent of the grants were devoted to agriculture from programs run by the Agricultural Adjustment Administration (AAA), Soil and Conservation Service (SCS), Farm Security Administration (FSA), and Agriculturual Experiment Stations (AES). The AAA was the major New Deal program which was devoted to payments to farmers to take land out of production. The initial AAA program was funded with an agricultural processing tax until it was declared unconstitutional in January 1936.[12] The AAA also administered the replacement program adopted under the Soil and Domestic Conservation Act of 1936, which continued to make payments to farmers to take land out of production without the processing tax. The FSA started within the FERA relief program and was more of a poverty relief program. The SCS began before the AAA was declared unconstitutional and provided grants for training farmers about soil conservation techniques.

Dealing with New Deal loans in the analysis is more difficult. It is not always clear how to treat the loans in terms of developing a multiplier. They are not government spending because at the time the loans were made they all required repayment. However, loan distributions are often listed in the budget deficit figures. As one example, the OGR treated the loans for construction of irrigation projects through the Bureau of Reclamation as grants. The loans were interest-free and the repayments were

often delayed for a long time period, and in a number of cases the loans were forgiven. Following the OGR practice, we treated the Bureau of Reclamation funds as grants in this analysis.

Nearly all of the rest of the loans were repaid, and thus were treated separately as a loan category.[13] There was a grant feature to the loans to the extent that they provided subsidies in the form of lower interest rates and better lending terms. The Home Owners' Loan Corporation (HOLC), for example, offered loans at interest rates below market interest rates charged on good loans in the housing market, even though the loans were already troubled. The HOLC also extended the standard repayment period, and allowed much smaller down payments relative to the value of the home. The Farm Credit Administration (FCA) loans provided good terms for farm mortgages and short-term loans for crops, seed, and tools.[14] The subsidies in RFC loans likely varied by type of loan. Given the measurement issues with loans, we add 10 percent of the value of the loans as a measure of the interest subsidy to the grants. We also run estimates where we add the full value of the loans to the grants. Given the measurement problems with loans, the loan results are treated as robustness tests of the analysis of New Deal grants.

World War I service-adjusted certificates, associated with the Veterans' Bonus of 1936, are divided into two categories, loans and death benefit grants before January 1936 and grants after that date. Since Cone and the BEA incorporated both the loans and grants in their measure of personal income, these deserve direct attention. In 1924 Congress enacted an adjusted-service certificate program for men and women who served in World War I. The program offered certificates that could be redeemed at face value twenty years after receipt. The amount to be paid was $1 for each day served in World

War I inside the U.S. and $1.25 for each day overseas, and then the amount was multiplied by 1.25 to take into account the delay in payment. Certificates valued at less than $50 were paid in cash immediately and the cash value of the certificate was paid out to heirs at the time of the veterans' death. These payments are treated as grants throughout.

Living veterans could also borrow from the Veterans' Bureau against the certificates by accepting a lien on the value of the certificate. They could pay back the loan and receive the full certificate value in 1945 or not repay and accept the amount left after interest was deducted in 1945. A huge burst in borrowing of 2 million loans valued at $795 million followed Congressional action on February 27, 1931 that improved the terms on loans to a maximum interest rate of 4.5 percent (soon reduced to 3.5 percent) for half the face value of the certificate. In January 1936 Congress passed the Veterans' Bonus Bill over Roosevelt's veto. Under this act, the adjusted-service certificates could be immediately converted to cash at the full face value. If veterans held them for more than one year they could receive the face value plus 3 percent interest per year until maturity on June 15, 1945. The VA received 3.3 million applications with a face value of $3.2 billion for settlement by June 30, 1936. After deducting outstanding liens from loans, the VA paid out $1.7 billion. Since the payment of liens released veterans from making future payments on loans, we treat the entire $3.2 billion as grants (Administrator of Veterans' Affairs 1931, pp. 10, 42-44; 1936, pp. 1, 22-24). In the analysis that combines loans and grants, however, the $3.2 million in grants was offset by the repayment of $1.5 billion in loans, so the combined value of grants and loans for the

adjusted service certificates in 1936 becomes the net value after repayment of loans of $1.7 billion.

Expectations for the Multiplier.

Unlike the macroeconomic estimates for the multiplier, the state multiplier we estimate for the United States is not a national multiplier. The U.S. states freely trade across state borders and there is a great deal of specialization in specific goods and services in each state. If thought of as a macroeconomic multiplier, it would be associated with a series of small open countries receiving grants from and paying tax revenues to a higher authority. At this stage, however, it cannot be seen as a multiplier for the whole area because the current estimation does not capture the spillover effects of the net federal spending on other areas of the country.

The coefficient on net federal spending in a regional model will be determined by a series of factors.[15] It will have positive effects to the extent that the net spending puts to work resources that would have been unemployed otherwise; to the extent that the net federal spending is more productive than the private spending that is replaced by the anticipation of future obligations for taxpayers; to the extent that the net federal spending produces social overhead capital (like roads, sanitation, public health programs) that made the inputs in the state economy more productive; and/or leads to multiplier effects. The Keynesian multiplier model arises as each income recipient purchases goods and services from others in the state who, in turn, spend their receipts on goods and services produced by others in the state. The regional neoclassical multiplier arises as labor demand is pushed out along an upward sloping labor supply curve.

The positive benefits of the multiplier are diminished through a variety of "leakages" when the money spent in the process is spent on goods and services outside the state economy. Much of the federal grant spending on a work relief program, like the FERA, WPA, or CWA, had small initial leakages because over 80 percent was spent on wages for people in the state. Grants from the Public Works Administration and Public Roads Administration had larger initial leakages because more than 50 percent of the monies were spent on materials and equipment imported from other states. More leakages occurred to the extent that the workers on federal projects spent their wages on goods and services produced outside the state. Each leakage reduced the extent to which the spending could be "multiplied" in a Keynesian sense by additional spending within the state.

The net federal spending had smaller positive effects on the economy to the extent that positive net federal spending led people to save in anticipation that they will have to pay future taxes. The net federal spending would have had an even weaker effect to the extent that it replaced local production of goods and services. The most obvious crowding out came from the AAA payments to farmers to take land out of production. The stated purpose of the act was to reduce output in hopes of raising prices enough to see an increase in income. In other cases, the federal spending may have replaced state and local projects that would have been built in the absence of federal spending. The impact of the reduction in state and local spending was likely to be small because states were generally required to run balanced budgets. Even when they ran deficits in the early 1930s, the deficits were relatively small as a share of state and local spending.

Finally, the impact of the net federal spending was reduced to the extent that it crowded out private production of goods and services in the state. An influx of federal spending may have bid up local wages in ways that raised the costs of hiring labor to private producers. It may have also bid up the prices for nonlabor inputs with the same effect. To the extent that increases in federal spending reduced private activity fully, it could even have a negative effect on state income if the output from federal spending was less valuable than the output it replaced.

An examination of the impact of federal fiscal policy on state economic activity differs from the macroeconomic analysis for the country as a whole. At the national level tax revenues have to balance with government expenditures either in that year or in the Ricardian sense that anticipated future tax revenues match current deficits (Barro 1982). Within each state this balance does not have to occur, as some states receive more government spending than taxes paid, while in others the reverse is true.

Federal taxation in the 1930s was relatively simple in that all tax rates were the same across all states for each activity in each year. However, the tax structure during the 1930s was quite different from the post-War economy, in which the vast majority of internal tax revenues come from taxes on income in the form of corporate, personal, and employment (social security and unemployment insurance) taxes. Between 1930 and 1940 the sources of federal revenue shifted dramatically away from income taxes toward excise taxes. Less than 10 percent of households earned enough to pay personal income taxes throughout the 1930s.[16] Federal revenues were small enough in 1930 that personal income taxes accounted for 38% of total internal revenue and corporate income taxes composed 42%. The Tax Revenue Act of 1932 led to several major changes. Even

though income tax rates were increased, the share of revenue from personal income taxes fell markedly to 16% in 1934 and 18% in 1940, while the share from corporate income taxes fell to 15% in 1934 before rising to 21% in 1940. The big revenue sources that arose from the 1932 tax changes was an expansion in excise taxes to cover manufactures of autos, tires, gasoline, lubricants and taxes on pipelines, telephones, telegraphs, and electricity. The share of internal revenue from excise taxes rose from 19% in 1930 to 28% in 1933. In 1933 the Roosevelt administration added in processing taxes on agricultural goods, a capital stock tax and eliminated Prohibition. The excise tax share jumped to 48% in 1934. Over the rest of the decade the excise tax share fell back to 35%, although the share of revenue from alcohol taxes remained steady around 12% (Shares calculated from Wallis, 2006, p. 5-86).

Aside from tax rate changes, the driving force behind changes in tax revenue within a state over time were changes in economic activity. Between 1930 and 1940 the correlations across time between real per capita personal income and real per capita taxes within the same state ranged from 0.9494 in Georgia to 0.3624 in South Carolina. It was above 0.8 for 22 states, between 0.7 and 0.8 in 18 states, between 0.6 and 0.7 in 5 states, 0.4913 in Nebraska, 0.4423 in Kansas, and 0.3624 in South Carolina. The taxation is so strongly tied to income levels that it is difficult to find instruments for taxation that are not also strong correlates of income.

We have worked to deal with federal taxation empirically in two ways. Since national tax rates were the same across all states, the simplest way is to incorporate year fixed effects that control for tax rate changes in a model of state per capita income as a function of national government spending per capita in the state. Essentially, the model

shows the multiplier of federal spending for state personal income after controlling for

the fiscal drag created by the tax rate system. We have also estimated the model with a

dependent variable of per capita state income as a function of real per capita national

government spending minus real per capita national taxes. This is the multiplier for

income from federal government spending net of taxes. We have more problems with

weak instruments in this last specification because the fiscal variable incorporates a tax

component that is strongly correlated with state income.

Empirical Approach

Despite the variety of different models that generate income multipliers of

government spending, the empirical estimations of multipliers tend to be similar in that

they use sparse specifications that are essentially reduced forms. Both Barro and Redlick

(2010) and Romer and Romer (2006) express worries about omitted variable bias that

might arise from the absence of exogenous factors in the model. To estimate the

multiplier, we use panel data methods with a measure of real per capita state income (y_{it})

in state i and year t in 1967 dollars as the dependent variable as a function of a measure

of real per capita federal spending in state i and year t (g_{it}),

$$y_{it} = \beta_0 + \beta_1\, g_{it} + \beta_2\, W + S + Y + S^*\, t + \varepsilon_{it}.$$

To control for omitted variables that might have influenced government policy and state

income, we include several vectors. A vector of extreme weather (W) variables controls

for weather factors that likely influenced crop production and prices in the farm sector,

construction activity, and other activities where weather was a factor. A vector of state

fixed effects (S) controls for factors like geography, state constitutions, and the basic economic, cultural, and demographic structure of each state that did not change over time but varied across states. A vector of year fixed effects (Y) controls for national changes in the economy that affected all states in each year, including monetary policy changes, changes in federal tax rates, the introduction and elimination of the National Recovery Administration and other changes in national regulation. A vector of state specific time trends (S*t) control for differences in the trend paths of economic activity in each state, including the shift away from state budget deficits in the early 1930s to budget surpluses in the late 1930s. Under the complete model specification the identification of the multiplier β_1 for net New Deal spending comes from the deviation from trend across time within states after controlling for nation-wide shocks.[17]

There still remains the possibility of biases from simultaneity and endogeneity. An ample literature on the geographic distribution of New Deal spending shows that the Roosevelt Administration tended to distribute more New Deal grants to areas where income was declining (see Wallis 1998, Fleck 2008, Fishback, Kantor, and Wallis, 2003; Neumann, Fishback, and Kantor 2010). This tendency imparts a negative bias to the multiplier coefficient.

In addition, there are a variety of other factors that may have changed over time in non-trend ways that may have influenced both net fiscal federal spending and per capita income in the state. There are two problems that arise in trying to control for these other factors. First, many that might be included as controls in a productivity model, such as wages, employment, and interest rates, are themselves components of personal income. By controlling for them we would be restricting the measure of the impact of net federal

expenditures to the parts of state income for which we have not controlled. Second, controls for age, race, ethnicity, population, and the structure of the economy are all available typically only during the census years and thus measures would have to be interpolated between census years to provide values. Essentially, the interpolated measures of the census-year structural variables between 1930 and 1940 would be linear combinations of the state-specific time trends and/or the state effects.

Third, state and local government spending and taxation are currently controlled for with the combination of the state fixed effects and state-specific time trends. Thus deviations in trend state fiscal activity is not being controlled. The multiplier estimate therefore may incorporate influences on income that arise from correlations between deviations from trend in state and local fiscal activity and federal spending. Since federal spending drove some state decisions, this might not be a disadvantage. As it stands today, comparable annual estimates of revenues and governmental cost payments in the states are available only up through 1931 and after 1936 for all states; therefore, any estimate incorporating controls for net state spending would miss a very large portion of the New Deal period. Information is available on cities over 100,000 people throughout the 1930s, but data for the rest of the governments is available only for 1932. We are in the process of filling the gaps in computerized information on the large cities and the states.[18]

To eliminate the biases arising from the issues described above, we follow an instrumental variable strategy. To be effective, the instrument must vary annually both across time and across space and be strongly correlated with the measures of federal government funds but not with the error term in the final-stage equation. We develop a

hybrid instrument that interacts two variables: a measure of swing voting in presidential elections up to the year *t-1* and aggregate federal government spending in year *t* in an area well outside the region where the state is located. The logic behind the hybrid instrument suggests that states with a greater share of swing voters gain larger increases in federal government spending when federal government spending elsewhere is growing.

The swing voting measure, which varies primarily across states, is the standard deviation of the percentage voting Democrat for president in the state between 1896 and the most recent presidential election prior to year *t*. The variable varies across time because each state's value changes between 1932 and 1933 and again between 1936 and 1937. This is a measure of swing voting in the state that has been found to have strongly influenced the geographic distribution of New Deal spending in a large number of studies (Wright 1974; Fishback, Kantor, and Wallis 2003; Fleck 2001, 2008, Wallis 1998, 2001). Nearly all of these studies find strong positive relationships between the swing voting measure and the distribution of per capita New Deal spending. By using the measure calculated up through the most recent presidential election before that year, we eliminate contemporaneous correlation with factors that influenced income in the state.[19] Given the controls for state fixed effects and state time trends, it seems unlikely that swing voting in the presidential elections between 1896 and year *t-1* would have been correlated with the error for income in the state in year *t* except through the New Deal distribution mechanism.

The second variable, which varies primarily across time, is New Deal grant spending per capita in an area well outside the census region in which the state is located.

The variable differs cross-sectionally as well because it varies across the nine census regions. To avoid spatial correlation with the error term from potential spillovers, the area used to construct the spending component of the instrument excluded any state within that Census region and states in nearby census regions. For New England, for example, the area used for the instrument does not include any states in New England, the Mid-Atlantic, the East North Central, or the states of Virginia, Maryland, Kentucky, or West Virginia.[20] Our expectation is that more federal spending in other parts of the nation was likely correlated across time with more federal spending within a particular state.[21]

We focus on grant spending for the instrumental variable rather than grant spending net of total taxes for several reasons. First, the grant spending version of the instrument has substantially more strength than the grants less total taxes version. Second, taxes are tied so closely to personal income that it is difficult to come up with a tax portion of the instrument that would not also be highly correlated with income, which, in turn, would increase the likelihood of correlation between the instrument and the error term in the final-stage equation. The second reason also explains why we have not been successful at developing an analysis where we look at the grants per capita and federal taxes per capita separately.

Since AAA grant spending differed markedly from other grant spending in its purposes, we also estimate a model with AAA grants and nonAAA grants. The instrument for nonAAA grant spending is constructed in the same way as described above after subtracting out AAA spending. To instrument for AAA spending, we set up a hybrid instrument that was developed after studying how the AAA handed out its

grants. For each crop in each year the AAA considered past crop output and current market conditions and set a price per acre to offer farmers to take land out of production. Typically, the allotments of acreage for each state were based on the average number of acres harvested and the yield per acre in the state over the previous five years. We developed an instrument that partially mimics that process while not including state-level information from the sample period on acreage, yields, or prices in the area. In essence, we set the basic structure for AAA payments in 1928 before the sample starts and then update the instrument each year based on changes in AAA spending elsewhere in the country. AAA spending well outside the region where the state was located is multiplied by an agricultural activity measure in 1928 based on all of the crops that received AAA subsidies in the 1930s. The activity measure is based on the sum of the following multiplication for each crop: the national price in 1928 times the state's yield per harvested acre in 1928 and the state's acres planted in 1928. The activity measure is a measure of the share of U.S. crop activity in that state in 1928. The instrument is expected to have strength because it has similarity to the five-year averages that served as the basis of distribution in the actual program. By fixing the share of agricultural activity in 1928 and updating with information on AAA spending well outside the region, the instrument should not be correlated with the error in the final stage regression except through its impact on AAA spending.

Results

The state personal incomes are on a calendar year basis, while the federal spending is reported on a fiscal year basis, covering the period from July 1 in year *t-1* to

June 30 in year t. This automatically imparts a half-year lag into the model. We investigated interpolating the federal spending data by state to a calendar-year basis by using state level information on monthly employment in programs, but we could not do this for all programs. Without such state-specific information, interpolation runs the risk of incorporating information on government spending in the first half of year $t+1$ into the year t estimate. We did not carry the process further because the interpolation might introduce biases that might arise if state income in year t influences the distribution of federal government spending in year $t+1$.

Table 2 shows coefficients and standard errors from a series of estimations with per capita state personal income in $1967 as a function of per capita estimates of federal government fiscal activity in the state. The first column shows the coefficient and standard errors for per capita federal grants from 7 regressions. The raw Ordinary Least Squares (OLS) estimate implies that a one dollar increase in per capita federal grants increased per capita state income by $1.04. Adding weather correlates raises this multiplier estimate to 1.68. The addition of state effects to control for time-invariant features of the states and year effects to control for nationwide shocks reduces the multiplier to 0.45. The further addition of state-specific time trends lowers the estimate to 0.16. This last estimate suggests that the federal spending crowded out a great deal of local economic activity and/or the impact is weakened greatly because the spending quickly leaked out of the local economy. The results for other measures of federal fiscal activity in the remaining columns of the table show a similar pattern of changes in coefficients as correlates are added to the analysis. The same pattern also appears for all measures of economic activity investigated in the paper.

Given that the Roosevelt administration distributed more grants to areas where the economy was in trouble, the coefficient likely is biased downward. The transition to instrumental variables is consistent with this view, as the coefficients from the instrumented equations are more positive than in the non-instrumented equations with the same correlates. The instrumental variable (IV) estimates that both control for a great deal of omitted variable bias and also meet the strongest criteria for instrument strength are the ones with controls for weather, state effects, and year effects. If we are willing to accept up to 10 percent weak instrument bias, the critical value for rejecting the hypothesis of weak instrument bias at the 10 percent level developed by Stock and Yogo (2002a, 2002b) for the Kleibergan-Paap (2006) (KP) version of the Donald F-statistic when using robust standard errors is 16.38 with one instrument for one right-hand side variable, 7.03 when we estimate the model with instruments for nonAAA and AAA grants. The IV estimates without state and year fixed effects generate very high KP statistics that reject the hypothesis of weak instrument bias, but the absence of year effects means that the effects of monetary policy, federal tax rate changes, the National Recovery Administration, and other changes that are correlated with both income and federal grant spending are incorporated into the coefficient of federal grant spending, as are time-invariant features of the state such as tax structures and regulatory policies. The state and year fixed effects eliminate this potential problem and the KP statistics reject the hypothesis of 10 percent weak instrument bias at the 10 percent level in all cases when state and year fixed effects are included. The addition of state-specific time trends serves to eliminate that potential source of omitted variable bias but at the cost of losing instrument strength as the KP statistics no longer reject 10 percent weak instrument bias

at the 10 percent level. Therefore, we will focus the discussion on the IV estimates with state and year effects.

The IV multiplier estimates for federal fiscal activity vary depending on the definition of fiscal activity. State personal income per capita rises by a statistically significant $1.39 in response to a dollar rise in federal grants per capita. When the full value of loans is added to the grants, the impact falls to 86 cents. Treating the loan subsidy as 10 percent of the loan value leads to an estimate of $1.08.

When the impacts of nonAAA and AAA grants are estimated separately, the nonAAA multiplier is higher than for all grants and the AAA multiplier is negative but statistically insignificant. Unlike the rest of the grants, the AAA grants were explicitly designed to reduce farm output by paying farmers to take land out of production. The payments would have benefitted farm owners and those tenants who received a share of the AAA payments. On the other hand, the likely reduction in the demand for farm labor would have reduced wages and employment for farm workers and share croppers (Fishback, Horrace, and Kantor (2005, 2006).[22] A dollar increase in non-AAA grants raises personal income by a much stronger $1.67. Meanwhile, an added dollar in AAA grants leads to a statistically insignificant reduction in income of 47 cents. The gains to farm owners and cash tenants from receiving AAA benefits appear to have been more than offset by losses of income for farm workers driven by the drop in farm labor demand that accompanied the reduction in acreage planted. Although we have controlled for national tax rates with the year fixed effects, we also estimate an alternative multiplier for federal grants net of federal tax collections in the state of 1.08.

During this period of extraordinary unemployment the estimates of the multiplier range from 0.9 to about 1.67 depending on the measure of government spending used. It is important to look beyond personal income per capita to other measures of economic activity of the period. A significant share of the government distribution of funds came in the form of transfer payments that passed directly into personal income by definition. Therefore, we can learn more about the spillover impact of the distribution of federal funds by looking at measures of income with transfer payments removed and measures of private income. Second, the state personal income measure is likely to have larger error than the subcategories because there was interpolation of values for many forms of nonwage income.

Tables 3 and 4 contain estimates of the impact of various measures of government spending for an alternative measure of production-based state income, two subcategories of state income and retail sales based on IV estimates with state and year fixed effects. The unreported estimates of other specifications typically follow similar patterns to the ones seen in Table 2. The coefficients without correlates and with weather correlates are substantially higher than the ones with state and year fixed effects and state and year effects and state time trends. The IV coefficients are more positive than the non-IV coefficients from estimations with the same correlates.

The dollar-for-dollar multipliers from IV estimation with state and year fixed effects for different measures of government spending have roughly the same ranking as in Table 2. NonAAA grants have the strongest positive effect, followed by all grants, then grants plus a 10 percent subsidy from loans. The smallest impacts are found for grants net of tax collections and grants plus the full value of loans are smaller, although

the ranking of these last two measures changes with different measures of economic activity. Finally, the AAA grants have negative but statistically insignificant effects but are not statistically significant for personal income and manufacturing payrolls.

At the risk of adding measurement error, we have also estimated the model with a state income measure that subtracts non-work-relief transfer payments and adds back payroll taxes and federal government pension payments. This income concept more closely fits the macroeconomic multiplier literature, which focuses on income measures without transfer payments based on the production of final goods and services.

The results for the state income measure without pure transfers suggest somewhat smaller multipliers than for the personal income measure including transfers. The multipliers are from 10 to 14 percent smaller for the various measures of government activity. This drop in the impact of the multiplier appears to be more than just the removal of the pure pass-through of transfer payments because transfers payments accounted for only about 6 percent of personal income. We can learn more from the process by examining how the government spending influenced specific components of the state income.

Across all types of government grants in Table 3, the impact of an added dollar of government funds was about 57 to 73 cents smaller for wage and salary income than for personal income. For example, the estimate for all grants for wage and salary income was $0.66, 73 58 cents less than the $1.39 for personal income. At the national level wage and salary income accounted for about 63 percent of personal income at the time (Cone, 1940, 22-26). The dollar-for-dollar estimate for per capita wage and salary income is substantially below that percentage for most of the government spending

measures. The wage and salary multiplier in Table 3 is 47.5 percent of the personal income multiplier for all grants, 35 percent for grants and loans and grants plus 10 percent of loans, 47.5 percent for grants minus taxes and 60.7 percent for nonAAA grants. These percentages suggest that the spillover of the government spending beyond the direct effect on income was smaller than what would be expected based on the typical share that wage and salary income composed of personal income.

An added dollar in AAA grants has a stronger negative and statistically significant effect on wage and salary income of -1.69 than the effect of -.57 that they had for personal income. The more negative effect would be expected because the income of farm owners and cash tenants is not included in wage and salary income. Farm owners and cash tenants were the groups most likely to benefit from the AAA, while wage incomes for farm workers were likely to be reduced by the drop in demand for farm labor associated with the reduction in acreage. This drop in farm wage incomes likely spilled over into the state's manufacturing earnings as the release of farm workers led to more competition for manufacturing work.

The estimates of economic activity with the least amount of interpolation were the payrolls for wage earners in manufacturing. Manufacturing wages accounted for between 16.3 and 20.2 percent of personal income in the 1930s (Creamer 1956, 120). The effects of an added dollar per capita of government spending on per capita manufacturing payrolls are very small, negative, and statistically insignificant for all but the non-AAA grants.[23]

To get at the consumption effects of federal spending, dollar-for-dollar estimates for retail sales per capita in 1929, 1933, 1935, and 1939 are provided. Fishback,

Horrace, and Kantor (2005, 55) suggested that about 53 percent of personal income is typically spent in the retail sector based on national aggregates. The results in Table 3 suggest that an additional dollar of government spending during the New Deal stimulated retail spending by a great deal more than the 50 percent of the rise in personal income. When estimated over the same years of 1929, 1933, 1935, and 1939, an additional dollar in grants per capita raised retail spending per capita by 74 cents relative to a $99 cent rise, so that 75.5 percent of the added income was spent in the retail sector. This percentage was highest at 95.1 percent for the multipliers for all grant and loan spending and was around 75.5 percent for all of the remaining measures. Given the depths to which income sunk during the Depression, it may not be a surprise that a larger share of new income than normal was being spent on retail sales. The resort to barter in some areas during the depths of the Depression also meant that additional cash would have been more likely to be spent in the retail sector. One caveat should be noted about the retail sales estimates, the measures of instrument strength typically reject the hypothesis of weak instruments only if someone is willing to accept weak instrument bias of 15 to 20 percent depending on the form of government spending.

Several of the measures of economic activity do not allow dollar-for-dollar comparisons, including indexes of payrolls and employment, and auto registrations per capita; therefore, we have translated the results reported in Table 3 to elasticities to make comparisons on the same basis for all measures of economic activity. Comparisons of the elasticity estimates in Table 4 with the dollar-for-dollar estimates in Table 3 highlight the fact that the annual federal spending per capita was small relative to per capita incomes at the time. The mean federal grant expenditure per capita between 1930 and

1940 was about 7.8 percent of per capita personal income ($83 compared with $1,067 in 1967 dollars). Add in the full amount of loans and the percentage rises to 10.2 percent. As a result, the $1.39 increase in personal income associated with an added dollar of federal grant spending converts into an elasticity of 0.108. Since wage and salary income, manufacturing payrolls and retail sales are smaller than personal income, the elasticities are much closer than the dollar-for-dollar estimates. Generally the elasticity estimates for each of measures that we look at are all less than 0.12.

The estimates for the broad-based payroll and employment indices in Table 4 reveal similar stories to the estimates for manufacturing payrolls. As was the case with the per capita manufacturing payrolls, the per capita broad-based employment index coefficients were all negative and statistically insignificant until the AAA and non-AAA grants are split. Generally, we cannot reject the hypothesis of no effect of the spending on employment.[24] These findings for *private* employment and payrolls are in the range of the mixed findings for the impact of New Deal relief spending found by Neumann, Fishback, and Kantor (2010) for a city-level monthly panel from 1932 through 1939 and Benjamin and Mathews' (1992) finding for a state panel from 1932-1939. Both find that relief spending was associated with crowding out of private employment after 1935. Neumann, Fishback, and Kantor found some positive effects of relief spending on employment from 1932 to 1935, while Benjamin and Mathews find crowding out of about 20 percent. Wallis and Benjamin (1982) also provide cross-sectional estimates that cast doubt on any positive effects of New Deal spending on private employment.

To get a measure of the impact of the spending on a major consumer durable, the effect of the spending on auto registrations per capita is performed. A one-percent

increase in federal grant spending raised auto registrations by a statistically significant 0.081 percent. The elasticity for nonAAA grants was higher at a statistically significant 0.083 percent, while the AAA grant elasticity was essentially zero. These elasticities are in the same range as the elasticities for per capita wage and salary income and per capita retail sales. To give this a dollar value context, value each car at the price of a new Ford in 1934, which was about $500, which is $1,247 when adjusted to the 1967 Consumer Price Index values used to control for the price level. An additional dollar of federal spending raised the value of car registrations by 22 cents.

State by State Estimates

The identification in the state and year fixed effects IV model comes from changes over time within the same state in the part of federal spending correlated with the instrument after controlling for nation-wide shocks in each year. The coefficient is therefore an average across the states. We have also estimated the relationship for each individual state over the period using a difference model to reduce problems with non-stationarity. The major issue with the state-by-state estimation is how well the model can control for national shocks. Our solution is to include the difference in the real per capita national money supply (M2) and a dummy variable for the National Recovery Administration (NRA) period from 1933 through 1935. Cole and Ohanian (2004) argue that the NRA's codes of competition held wages and prices high and contributed greatly to the underemployment of resources. Changes in tax rates were important but there were multiple changes over the period and there are few degrees of freedom. To capture the impact of taxes we estimate the model with grants net of federal taxes in each state. Results are reported for estimates without the taxes for comparison purposes.

Table 5 shows the dollar-for-dollar effects on per capita state personal income of a one dollar increase in per capita grants net of federal taxes in each state. For comparison purposes, when the model specification is estimated for the panel the multiplier coefficient is 0.605 with a t-statistic of 3.19 and the instrument has strength. In state by state estimates, one issue that arises is that the instrument strength varies for each state. There were 33 states where the instrument strength rejected weak instrument bias of 10 percent or more at the 10 percent level, 7 estimates with weak instrument bias of less than 15 percent and 8 with very weak instruments. The estimates were generally consistent with a view of negative endogeneity, as the IV estimates were more positive, by an average of about .25 than the OLS coefficients in 35 of the 40 states where weak instrument bias is not a problem. The average dollar-for-dollar coefficient for those states was 0.80. For the 40 states with no more than 15 percent weak instrument bias, the average coefficient was .79 and the values ranged from -1.27 in Kansas to 3.4 in Idaho. The multiplier estimates for states that where weak instrument bias could not be rejected included 5 of the 7 largest values in absolute value.

There was not much of a discernable pattern in the estimates across states. Among the states with less than 15 percent weak instrument bias, the extreme values over 2 were found in Pennsylvania, New Jersey, and Idaho. Pennsylvania was probably the most self-sufficient state but Idaho was one of the smallest states. States with values between one and two included states of all sizes from several regions. Some had large populations, like New York, Massachusetts, and California, but most were in the bottom half of the population distribution, including West Virginia, Oregon, Utah, Mississippi,

Washington, Maine, and Florida. Negative multipliers were found in Kentucky, Oklahoma, Minnesota, and Kansas.

Additional Considerations

The problems with endogeneity create thorny issues for the estimation. Our focus has been on using an estimation process that relies on a plausibly exogenous and strong instrument to control for endogeneity. There are other plausible ways to estimate the model, but we have faced problems with weak instrument bias in those other methods.

Another plausible way to estimate the model would be to use first differences instead of levels with fixed effects to control for time-invariant features of each state. As seen in the analysis here, the instrument is strong in the levels with fixed effects analysis. However, when we estimate the first difference version with year fixed effects, the instrument no longer has strength, and we have as yet been unable to find a strong instrument. The difference in specification may have some implications for the results. In non-IV estimation for the personal income multiplier, the coefficient from a differenced model with year fixed effects is 0.70, which is larger than the 0.45 estimate from a level model with state and year fixed effects. The coefficient from a differenced model with year and state fixed effects is 0.75, compared with a coefficient of 0.16 for the level model with year and state fixed effects and state-specific time trends. It is unclear what the difference in coefficients would be if a strong instrument were found for the differenced specification. We experimented with an Arellano and Bond (1991) dynamic panel estimation procedure, but the short time frame and limited number of states led to weak instrument problems.

Given that the states are part of a large open economy, the impact of federal spending can spill over into other states. The direction of the bias could plausibly go in either direction. The multiplier estimate might be overstated to the extent that a rise in government spending in a neighboring state leads to more spillover spending in the state of interest and federal spending in the neighboring state is positively correlated to government spending in the state of interest. The multiplier would be understated with a positive spillover from government spending in the neighboring state but a negative correlation between federal spending in the neighboring state and the state of interest. As a first cut, we estimated a model with a spatial lag for income in neighboring states. The nonIV and IV results lead to substantially smaller multipliers, but we have not yet found a strong instrument for the income in the neighboring states.

Conclusions

If there was any time to expect a large peace-time multiplier effect from federal spending in the states, it would have been during the period from 1930 through 1940 Unemployment rates with work relief workers treated as unemployed were never below 14 percent during the decade. Even if people on work relief were treated as employed, the unemployment rate never fell below 9 percent (Darby 1976). There was idle capital in nearly every industry. As a result, there were clearly a large number of underemployed resources that could have been soaked up by federal spending without crowding out private activity. As of the end of May 2009, the unemployment rate reached over 9 percent for the first time since the early 1980s, still nowhere near the highs over 20 percent for any measure of unemployment in 1932 and 1933. We would

bet that the impact of net federal spending in an economy with lower unemployment would be smaller than it was during the New Deal.

Estimates with state and year fixed effects (and state-specific time trend) that do not use instruments suggest multipliers in the 0.1 to 0.5 range. Given that New Deal funds were distributed in part in response to drops in economic activity, there is ample reason to believe that the non-IV multiplier estimates display negative endogeneity bias even with the fixed effects. The estimates for the state multipliers that we think are most accurate are the IV estimates controlling for state and year fixed effects. The IV estimates without controls for state and year effects are likely too high because they do not control for nationwide monetary and tax rate shocks, nor do they control for fundamental time-invariant features of the states. The addition of state-specific time trends leads to weak instrument bias.

The dollar-for-dollar multiplier estimates show the dollar change in the measure of economic activity in response to a one dollar increase in the measure of government spending. For state personal income the multiplier estimate ranges from 0.86 when grants and all loans are included as government spending to 1.67 for nonAAA grants, while a dollar of AAA grants designed to take land out of production led to a statistically insignificant reduction in personal income of -0.57. Personal income includes transfer payments. When transfer payments and a production-based measure of state income is used, the multipliers tend to be about 10 to 14 percent smaller.

A closer examination of specific components of income shows that the impact of a dollar of federal spending on wage and salary income multipliers ranged from 0.3 for grants combined with loans to 1.01 for nonAAA grants with a stronger negative effect of

AAA grants. The stimulus to retail sales of an additional dollar of federal spending ranged from 0.57 dollars for grants net of taxes to $1.03 for nonAAA grants. Again there was a strong negative effect of AAA grants. An additional dollar of federal grant spending also likely raised the value of automobiles registered by around 22 cents.

The effects of government spending on payrolls and employment in manufacturing and the broader economy were generally very small and slightly negative. The findings for employment are consistent with earlier studies that found no effect or even crowding out of private employment by federal spending activity.

If we apply the lessons of the New Deal to the federal fiscal stimulus today, it is important to realize that the estimates for the states are not for a national multiplier. The estimates are for how much specific states might anticipate a direct effect of fiscal stimulus from the federal government. Given the differences in unemployment levels between the 1930s and today, we should anticipate that the spur to income and employment would be smaller in size relative to the stimulus in the 1930s. Our rough guess is that the current multiplier in the states would be around one or less for personal income, which includes transfer payments, and smaller for other measure of income. The absence of a private employment boost during the New Deal suggests that further stimulus packages would not likely translate into increases in private employment.

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Figure 1
Per Capita New Deal Grants and Per Capita Federal Tax Receipts for the Year 1935 in
1967$ by State, without Delaware
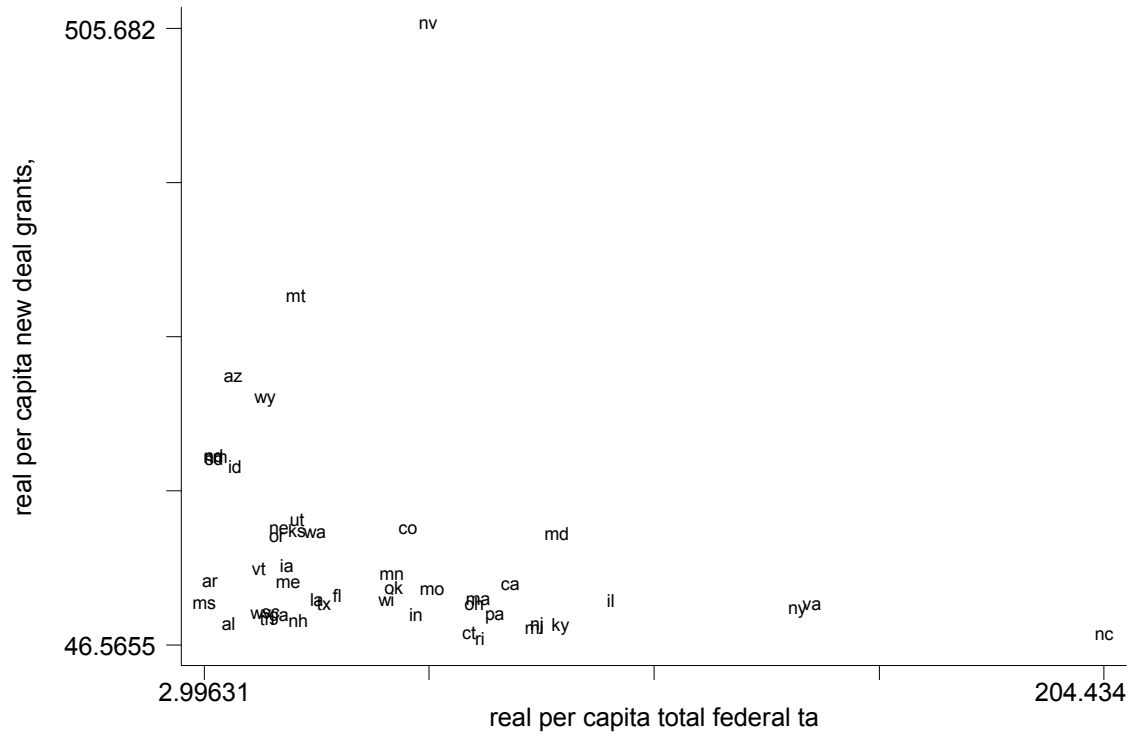
Delaware had per capita federal tax receipts of $321.16 and per capita federal grants of
$67.45 in 1967 dollars for the year 1935.

Table 1
Total and Per Capita Federal Spending by Program in Millions of Contemporay
Dollars for the period July 1, 1932 through June 30, 1939

	Acronym	Amounts From July 1, 1932 to June 30, 1939 (Millions $)	Per Capita	Category	First Fiscal Year with Significant Spending	Ended Before 1939
TOTAL TAXES COLLECTED FROM STATES		26,061	213.11			
NONREPAYABLE GRANTS						
Works Progress Administration	WPA	6,844	55.97	Work Relief	1936	
Veterans' Administration	VA	3,955	32.34	Relief	Pre 1933	
Federal Emergency Relief Administration	FERA	3,059	25.02	Relief and Work Relief	1934	Mar-37
Agricultural Adjustment Administration1	AAA	2,863	23.41	Agriculture	1934	
Civilian Conservation Corps	CCCG	2,130	17.42	Work Relief	1934	
Public Roads Administration	PRA	1,613	13.19	Public Works	Pre 1933	
Rivers and Harbors and Flood Control	RHFC	1,316	10.76	Public Works	Pre 1933	
Public Works Administration--Nonfederal Projects	PWANF	1,032	8.44	Public Works	1934	
Civil Works Administration	CWA	807	6.60	Relief/Public Works	1934	Mar-34
Social Security Act	SSA	759	6.21	Relief	1936	
Public Works Administration--Federal Projects	PWAF	632	5.16	Public Works	1934	
Balance from Relief Acts	BRA	376	3.08	Relief	1936	
Public Buildings Administration	PBA	324	2.65	Public Works	Pre 1933	
Bureau of Reclamation	BR	290	2.37	Public Works	1934	
Farm Security Administration	FSA	273	2.24	Agriculture	1936	
National Guard	NG	219	1.79	Military	Pre 1933	
Public Works Administration--Housing Projects	PWAH	129	1.05	Public Works	1935	
Soil Conservation Service	SCS	100	0.82	Agriculture	1934	
Agricultural Extension Work	AE	94	0.77	Agriculture	Pre 1933	
Vocational Education	VE	90	0.74	Education	Pre 1933	
U.S. Employment Service	USES	80	0.65	Relief	1934	
Indian Service - Civilian Conservation Corps	CCCIS	51	0.42	Relief	1934	

Agricultural Experiment Stations	AEX		36	0.29	Agriculture	Pre 1933
Forest Service (Roads)	FSR		34	0.28	Public Works	1937
Colleges of Agriculture and Mechanical Arts	CAM		24	0.19	Education	Pre 1933
Forest Funds	FF		17	0.14	Public Works	Pre 1933
Mineral Lease Act Payments	ML		11	0.09	Public Works	Pre 1933
Land Utilization Program	LUP		11	0.09	Public Works	1939
State Soldiers' and Sailors' Homes	SSS		4	0.03	Relief	Pre 1933
Special Funds	SF		2	0.02	Miscellaneous	Pre 1933
Office of Education--Emergency Relief Act Funds	OE		2	0.02	Education	1936
State Marine Schools	SMS		1	0.01	Education	Pre 1933
Books for the Blind	BFB	a)		0.00	Education	Pre 1933
Federal Water Project Payments	FWP	a)		0.00	Public Works	Pre 1933
Nonrepayable Grants Total			27,180	222.26		
REPAYABLE LOANS CLOSED						
Reconstruction Finance Corporation	RFC		4,782	39.11	All	1932
Farm Credit Administration	FCA		3,957	32.35	Agriculture	Pre 1933
Home Owners' Loan Corporation	HOLC		3,158	25.83	Home Finance	1934	1936
Commodity Credit Corporation	CCCL		1,186	9.70	Agriculture	1934
Public Works Administration	PWAL		508	4.15	Public Works	1934
Farm Security Administration	FSAL		337	2.76	Agriculture	1934
Home Owners' Loan Corporation and Treasury Investments in Bldg. and Savings and Loans Associations	HOLCT		266	2.17	Home Finance	1934
Federal Reserve Banks.	FRB		125	1.02	Finance	1935
Rural Electrification Administration	REA		123	1.01	Agriculture	1936
U.S. Housing Authority	USHA		56	0.45	Public Works	1939
Farm Tenant Purchases	FTP		33	0.27	Agriculture	1938
Disaster Loan Corporation	DLC		17	0.14	Relief	1937
Total Repayable			14,549	118.97		
Value of Loans Insured by Federal Housing Administration			0	0.00		
Title I --Refurbishing and Maintanence Loans			834	6.82	Home Finance	1936
Title II--Home Mortgages.			1,855	15.17	Home Finance	1936
Total Housing Loans Insured			2,689	21.99		

[a]Under 500,000 dollars.

Table 2
Estimates of Dollar-for-Dollar Effect of Government Spending Measure on State Personal Income, 1930-1940
t-statistics Listed Below Coefficients

	All Grants	All Grants and loans	All Grants and 10 percent of loans	Grants minus Taxes	Grants and AAA separated	
LEAST SQUARES					Grants except AAA	AAA
No Correlates	**1.04**	**0.56**	**0.99**	**-0.87**	**1.97**	**-7.34**
	2.70	*1.48*	*2.76*	*-1.44*	*6.38*	*-4.40*
Weather Correlates	**1.68**	**0.99**	**1.58**	**-0.39**	**1.91**	**-0.60**
	9.43	*5.66*	*9.45*	*-0.74*	*9.48*	*-0.61*
Weather Correlates and State and Year Fixed Effects	**0.45**	**0.38**	**0.51**	**-0.19**	**0.44**	**0.47**
	2.29	*4.29*	*3.22*	*-0.73*	*2.20*	*1.22*
Weather Correlates and State and Year Fixed Effects and State-Specific Time Trends	**0.16**	**0.14**	**0.20**	**-0.14**	**0.13**	**0.85**
	0.69	*0.87*	*0.82*	*-1.19*	*0.58*	*1.90*
TWO-STAGE LEAST SQUARES						
No State or Year Fixed Effects	**2.63**	**2.33**	**2.42**	**3.58**	**3.64**	**-5.29**
	10.23	*9.06*	*9.67*	*7.18*	*9.61*	*-3.35*
State And Year Fixed Effects	**1.39**	**0.86**	**1.08**	**1.08**	**1.67**	**-0.47**
	3.44	*3.06*	*3.01*	*2.92*	*3.56*	*-0.73*
State and Year Fixed Effects and State-Specific Time Trends	**0.97**	**0.86**	**1.08**	**1.21**	**1.53**	**-3.79**
	1.80	*1.71*	*10.43*	*1.69*	*2.28*	*-1.20*
Kleibergen-Paap Wald Rank F-statistics No State or Year Fixed Effects	281.50	203.17	264.47	109.88	50.23	
State and Year Fixed	23.45	27.07	25.59	20.26	10.38	

Effects

State and Year Fixed Effects and State-Specific Time Trends	8.84	7.64	6.97	4.10	2.46

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Sources: See Data Appendix.

  Notes: This is a balanced panel with information for 48 states for each year from 1930 through 1940. Estimation used the STATA 10 reg and ivreg2 programs. For the calculations of t-statistics, standard errors for the noninstrumental variable estimates are based on White corrections using the robust command with standard errors clustered at the state level.   IV estimates used White-corrected standard errors. When compared with the Stock-Yogo critical values, the Kleibergen-Paap rank Wald (KP) F statistic can be used to test for weak-instrument bias based on the maximum weak-instrument bias that one is willing to accept. In the analyses with one instrument for one government activity measure, the critical value is 16.38 at the 10 percent level if someone is unwilling to accept more than 10-percent weak instrument bias, 8.96 for unwillingness to accept more than 15 percent bias and 6.66 for 20 percent bias.   In the analysis with two instruments for nonAAA and AAA grants the critical values are 7.03 for 10 percent bias, 4.58 for 15 percent bias, and 3.95 for 20 percent bias.

When loans are included the panel drops 1940 due to problems in obtaining data for loans in 1930. The measures of economic activity are on a calendar year basis while the measures of government activity are on the July t-1 to June t fiscal year basis. Commodity Credit Corporation loans were dropped from the loan figures due to inaccurate measurement of the distribution of loans across states.

Table 3
Estimates of Dollar-for-Dollar Impact of Measures of Government Activity on Measures of Economic Activity
t-statistics Listed Below Coefficients

Dependent Variable and Time Frame		Grants	All Grants and loans	All Grants and 10 percent of loans	Grants minus Taxes	Estimation Separating NonAAA and AAA Grants	
						Non-AAA	AAA
Per Capita Personal Income in 1967$, 1930-1940	**$ for $**	**1.39**	**0.86**	**1.08**	**1.08**	**1.67**	**-0.47**
	t-statistic	*3.44*	*3.06*	*3.01*	*2.92*	*3.56*	*-0.73*
	KP F-statistic	23.45	27.07	25.59	20.26	11.82	
Per Capita State Income (adjusted for transfers) 1967$, 1930-1940	**$ for $**	**1.20**	**0.75**	**0.94**	**0.93**	**1.51**	**-0.30**
	t-statistic	*3.44*	*3.22*	*3.19*	*2.92*	*3.65*	*-0.55*
	KP F-statistic	23.45	27.07	25.59	20.26	10.85	
Per Capita Wage and Salary Income in 1967$, 1930-1940	**$ for $**	**0.66**	**0.30**	**0.38**	**0.51**	**1.01**	**-1.69**
	t-statistic	*2.77*	*2.06*	*0.19*	*2.50*	*3.49*	*-4.56*
	KP F-statistic	23.45	27.07	25.59	20.26	10.38	
Manufacturing Payroll Per Capita in 1967$, 1929, 1931, 1933, 1935, 1937, 1939	**$ for $**	**-0.005**	**-0.004**	**-0.005**	**-0.004**	**0.053**	**-0.400**
	t-statistic	*-0.04*	*-0.04*	*-0.04*	*-0.04*	*0.33*	*-1.80*
	KP F-statistic	21.19	18.14	21.31	16.89	8.85	
Per Capita Personal Income in 1967$, 1929, 1931 1933, 1935, 1937, 1939	**$ for $**	**1.05**	**0.80**	**1.02**	**0.74**	**1.06**	**1.04**
	t-statistic	*2.51*	*2.51*	*2.52*	*2.10*	*2.00*	*1.26*
	KP F-statistic	21.19	18.14	21.31	16.89	8.85	
Per Capita Retail Sales in 1967$, 1929, 1933, 1935, 1939	**$ for $**	**0.74**	**0.57**	**0.72**	**0.51**	**1.03**	**-1.76**
	t-statistic	*1.75*	*1.74*	*1.75*	*1.54*	*2.05*	*-2.42*
	KP F-statistic	11.37	9.02	11.38	8.39	4.72	
Per Capita Personal Income in 1967$, 1929, 1933, 1935, 1939	**$ for $**	**0.99**	**0.75**	**0.96**	**0.67**	**1.09**	**0.11**
	t-statistic	*1.72*	*1.70*	*1.72*	*1.47*	*1.56*	*0.11*
	KP F-statistic	11.37	9.02	11.38	8.39	4.72	

Coefficient for Wage and Salary Income as a Percentage of the coefficient of Personal Income	47.5	35.2	35.2	47.5	60.7	359.7
Coefficient for Manufacturing Payroll as a Percentage of the coefficient of Personal Income for same time frame	-0.5	-0.5	-0.5	-0.5	5.0	-38.5
Coefficient for Retail Sales as a Percentage of the coefficient of Personal Income for same time frame	75.5	75.5	75.5	75.5	95.1	-1549.7

Sources: See Data Appendix.

Notes: Each estimate in bold is the coefficient of the government spending measure in an analysis with an economic activity measure as the dependent variable from a Two-Stage Least Squares Instrumental Variable Regression with state and year fixed effects, using the STATA 10 ivreg2 command. All analyses except the ones restricted to 1929, 1933, 1935, and 1939 include weather variables as correlates. The t-statistics in italics below the coefficients are based on standard errors estimated with White corrections using the robust command.   The KP F-statistics below the standard errors are the Kleibergen-Paap rank Wald (KP) F statistic. For critical values for weak instrument tests see the notes to Table 2.

Table 4
Table 4
Estimates of Elasticities of Measures of Economic Activity with Respect to Measures
of Government Activity
t-statistics of Original coefficients listed Below Elasticities

Dependent Variable and Time Frame		Grants	All Grants and loans	All Grants and 10 percent of loans	Grants minus Taxes	Estimation Separating NonAAA and AAA Grants	
						NonAAA	AAA
Per Capita Personal Income in 1967$, 1930-1940	**Elasticity**	**0.108**	**0.089**	**0.085**	**0.033**	**0.116**	**-0.004**
	t-statistic	*3.44*	*3.06*	*3.01*	*2.92*	*3.56*	*-0.73*
	KP F-statistic	23.45	27.07	25.59	20.26	11.82	
Per Capita Wage and Salary Income in 1967$, 1930-1940	**Elasticity**	**0.087**	**0.053**	**0.051**	**0.026**	**0.120**	**-0.024**
	t-statistic	*2.77*	*2.06*	*0.19*	*2.50*	*3.49*	*-4.56*
	KP F-statistic	23.45	27.07	25.59	20.26	10.38	
Manufacturing Payroll Per Capita in 1967$, 1929, 1931, 1933, 1935, 1937, 1939	**Elasticity**	**-0.003**	**-0.003**	**-0.003**	**-0.001**	**0.028**	**-0.025**
	t-statistic	*0.56*	*0.56*	*0.56*	*0.55*	*0.80*	*-1.56*
	KP F-statistic	18.53	14.95	18.37	13.77	8.17	
Per Capita Personal Income in 1967$, 1929, 1931 1933, 1935, 1937, 1939	**Elasticity**	**0.069**	**0.073**	**0.069**	**0.016**	**0.062**	**0.007**
	t-statistic	*2.23*	*2.22*	*2.23*	*1.87*	*1.80*	*0.85*
	KP F-statistic	20.05	16.80	20.00	14.85	8.60	
Per Capita Retail Sales in 1967$, 1929, 1933, 1935, 1939	**Elasticity**	**0.082**	**0.090**	**0.083**	**0.020**	**0.100**	**-0.022**
	t-statistic	*1.85*	*1.86*	*1.76*	*1.61*	*2.05*	*-2.42*
	KP F-statistic	7.18	5.15	11.30	7.09	4.7	
Per Capita Personal Income in 1967$, 1929, 1933, 1935, 1939	**Elasticity**	**0.063**	**0.070**	**0.064**	**0.015**	**0.062**	**0.001**
	t-statistic	*1.85*	*1.86*	*1.76*	*1.61*	*2.05*	*-2.42*
	KP F-statistic	7.18	5.15	11.30	7.09	4.7	
Index of Per Capita Payroll, Broad Measure, 1932-1939	**Elasticity**	**-0.011**	**-0.013**	**-0.011**	**-0.004**	**-0.027**	**0.000**
	t-statistic	-0.14	-0.14	-0.14	-0.14	-0.31	0.00
	KP F-statistic	19.39	14.41	19.61	14.22	9.15	
Per Capita Employment Index, Broad Measure, 1929-1939	**Elasticity**	**-0.012**	**-0.008**	**-0.008**	**-0.004**	**-0.032**	**0.015**
	t-statistic	-0.64	-0.43	-0.43	-0.65	-1.50	3.18
	KP F-statistic	23.45	27.07	25.59	20.26	10.38	
Autoregistrations Per Capita, 1930-1940	**Elasticity**	**0.081**	**0.070**	**0.067**	**0.024**	**0.083**	**0.000**
	t-statistic	4.17	3.85	3.94	3.72	4.18	0.01

| KP F-statistic | 23.45 | 27.07 | 25.59 | 20.26 | 10.38 |

Notes. Each estimate in bold is an elasticity calculated from the coefficient of the government spending measure in an analysis with an economic activity measure as the dependent variable from a Two-Stage Least Squares Instrumental Variable Regression with state and year fixed effects, using the STATA 10 ivreg2 command. The elasticity was calculated using the mean values for the time frame. All analyses except the ones restricted to 1929, 1933, 1935, and 1939 include weather variables as correlates. The standard errors in italics below the coefficients are based on White corrections using the robust command.   The KP F-statistics below the standard errors are the Kleibergen-Paap rank Wald (KP) F statistic. For critical values for weak instrument tests see the notes to Table 2.

Table 5
Dollar-for-Dollar Estimates by State from Differenced Regressions
Using OLS and IV

State	Dollar-for-Dollar Coefficient	t-statistic	Dollar-for-Dollar Coefficient	t-statistic	KPF
Rejects 10-percent Weak Instrument Bias at the 10-percent Level					
New Jersey	0.95	0.83	2.21	2.85	19.32
Pennsylvania	0.78	0.62	2.06	2.62	41.24
West Virginia	1.26	1.66	1.80	6.13	28.82
Oregon	1.40	2.48	1.59	4.58	26.02
Utah	0.96	1.10	1.26	2.20	79.67
Massachusetts	0.54	1.48	1.22	1.88	30.50
Mississippi	0.97	2.11	1.07	2.98	37.68
Washington	0.84	1.15	1.06	2.28	68.63
California	0.85	1.04	1.03	1.76	21.15
North Carolina	0.62	0.85	0.86	1.93	22.05
Vermont	0.66	1.62	0.78	2.91	83.26
Colorado	0.79	1.61	0.76	1.98	81.61
Tennessee	0.47	0.57	0.73	1.69	41.54
New Hampshire	0.63	1	0.70	2.1	61.47
Arkansas	0.59	1.39	0.70	2.2	25.75
Ohio	0.47	0.45	0.66	0.77	25.94
New Mexico	0.51	1.10	0.64	2.27	44.83
Rhode Island	1.29	1.94	0.61	1.18	259.36
Alabama	0.56	1	0.61	1.55	44.83
Connecticut	0.57	0.5	0.61	3.19	144.60
Louisiana	0.47	0.97	0.58	1.36	31.52
Indiana	0.33	0.24	0.57	0.61	68.43
Wyoming	0.23	0.28	0.52	0.75	19.37
Georgia	0.48	1.33	0.51	1.98	67.28
Illinois	0.16	0.12	0.49	0.44	23.97
Wisconsin	0.26	0.27	0.37	0.5	118.42
South Carolina	0.55	1.84	0.37	1.67	70.08
Missouri	-0.06	-0.07	0.32	0.52	36.11
Virginia	0.00	0	0.12	0.26	62.49
Kentucky	-0.82	-0.12	-0.03	-0.06	35.22
Oklahoma	-0.14	-0.19	-0.09	-0.15	58.38
Minnesota	-0.82	-0.81	-0.50	-0.65	28.48
Kansas	-0.92	-1.03	-1.27	-1.32	25.50
Rejects 20-percent Weak-Instrument Bias at 10 percent Level					
Idaho	4.02	4.26	3.46	4.26	10.20
New York	0.34	0.47	1.50	1.51	9.33
Maine	0.84	1.08	1.29	1.69	15.30
Florida	0.83	0.92	1.19	1.24	11.06

Texas	0.10	0.13	0.67	0.79	10.49
Maryland	0.08	0.14	0.50	1.20	10.53
Arizona	0.01	0.00	0.28	1.07	14.81
Cannot Reject 20-percent Weak-Instrument Bias at 10 percent level.					
South Dakota	3.42	3.24	17.54	0.82	0.26
Nevada	0.54	1.35	3.51	1.15	0.73
Delaware	0.63	1.05	1.29	1.18	1.58
Michigan	-1.11	-1.68	1.09	0.62	3.30
Montana	1.14	1.65	-0.52	-0.68	5.97
Nebraska	0.40	0.26	-6.32	-1.53	2.94
Iowa	-3.76	-1.15	-8.30	-2.85	3.94
North Dakota	2.81	2.08	-24.79	-0.34	0.08

Notes. The estimates come from difference regressions of the change in real per capita personal income on the change in real per capita federal grants minus taxes, the change in the real money supply, a dummy for the NRA period, and a year trend. The estimates cover the period 1930 through 1940 for each state.

DATA APPENDIX

State Personal Income

There are different concepts of government spending used in the literature and in national income accounting. Many macroeconomic models refer to government purchases of goods and services when examining real GDP estimates. They exclude transfer payments.

In the analysis in this paper the state personal income and state populations are from the current BEA website. Bureau of Economic Analysis, U.S. Department of Commerce, Regional Economic Information System, http://www.bea.gov/regional/spi/SA1-3fn.cfm. The definitions reported there are very similar to the original BEA estimates from the late 1930s and early 1940s from Creamer and Merwin (1941). Their definition of personal income is based on the definitions used for monthly personal income described in Cone, 1940. The focus was on consumer purchasing power "Consumer purchasing power" signifies the ability of consumers to purchase the new goods and services currently produced by business enterprises.

The definition of income payments is National Income after subtracting business savings, social security contributions from employer and employee, contributions to the Railroad Retirement Fund and contributions to retirement systems for government employees and then adding direct relief, federal pensions to veterans, World War I Adjusted Service Compensation (ASC) benefits in the form of loans or cash payouts, other government retirement allowances, unemployment compensation, railroad insurance benefits and old-age insurance benefits. Agriculture benefit payments are included in income (Cone 1940, pp. 3, 4, 8, 10, 13, 39).

In addition, the following items were excluded from state personal income: capital gains; earnings from odd jobs due to lack of data; Illegal earnings because they have "no economic value within the legal framework of the producing economy;" and imputed income from ownership of durable consumers' goods is excluded.

Cone (1940, p. 8) explained the logic for incorporating the World War I ASC loans and payouts in the following way:

> "Prior to June 1936 payments to World War veterans took the form of cash loans on the security of their adjusted service certificates; in that month the Federal Government, in discharge of its obligations on amount of adjusted service legislation, remitted to the veterans more than $2,000,000,000 worth of adjusted service bonds and some cash. The larger portion of these bonds were liquidated during the year 1936, but the Treasury has been redeeming them in smaller amounts during the past 3 years; the present rate is about $2,000,000 a month. More properly , then, the payments to veterans represent in the first instance loans on existing assets and in the second the gradual liquidation of these assets rather than the actual payment of income as here defined. Nevertheless, because these disbursements of the Federal Government were in the nature of original receipts to the veterans and because, owing to the large volume of the disbursements and their wide distribution among 3,000,000 veterans, they represented an important stimuls to consumption on two distinct occasions, they have been incorporated into the monthly series.

Since the personal income payments include transfers, transfers have been incorporated in the federal government distribution of grants (Cone 1940, p. 8, 39).

Other Measures of Economic Activity

State wage and salary income is from Creamer and Merwin (1942). Cone (1940) provides an overview of the series used to construct the data. Manufacturing Payrolls for 1929, 1931, 1933, 1935, 1937, and 1939 are from the Biennial U.S. Manufacturing Censuses of 1931, 1933, 1935, 1937, and from the Manufacturing Volumes in the Fifteenth and Sixteenth Censuses of the United States and Haines (ICPSR 2896). Retail Sales data are from retail censuses conducted by the Bureau of the Census and

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reported in U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, 1936 and 1939. The 1929 and 1939 retail sales are from Haines (ICPSR 2896).

Wallis (1989) constructed the index for the broad measure of employment, which covers establishments in manufacturing, mining, retail, wholesale, laundries, and street railroads, and does not include railroads, construction, or government workers. The index is built up from the U.S. Bureau of Labor Statistics monthly establishment surveys collected by various agencies around the country. Wallis then benchmarked the series to census employment figures. The index of payrolls for the broad measure of employment is constructed from the same information and is built up from the Monthly Labor Review and a series of monthly reports *Employment and Payrolls*. We have not benchmarked the payroll indices. In the payroll index we substituted information from Milwaukee from the Neumann, Fishback, and Kantor (2010) dataset for information for Wisconsin because the Wisconsin series led to extremely unusual figures. Wallis (1989) also mentions this issue). We have also created the unbenchmarked employment index from this data and have used it to create an estimate of average monthly earnings.

Automobile registrations for each state were collected from U.S. Public Roads Administration (1947).

Adjustments to convert personal income back to income from production.

Creamer and Martin (1943) reported a category "other labor income such as pensions, compensation for injuries, direct and work relief, and social insurance benefits." These included adjusted service certificates. After subtracting this measure from the state personal income measure this will give us an estimate of personal income without transfers or work relief. This measure will understate a production-based measure of income because it still is missing the payroll taxes paid for social security and unemployment insurance and contributions from government employees to their pension programs.

To get closer to the definition of production based income, we can add back work relief information to the income measure on a calendar year basis by adding the sums of monthly measures of FERA work relief obligations (WPA, Final Statistical Report of the FERA, 1942, pp. 159-64), Civil Works Administration payments by calendar year (Works Progress Administration, 1943a); Works Progress Administration spending that is converted from a fiscal year basis to calendar year basis using employment figures for the WPA by state for the months January, April, July, and October each year (WPA, Final Report of the WPA, 1943, pp. 110-113).

For the CCC, we compiled information on the number of males enrolled from each state as of the last day of the months of October and November of 1933, January, August and October of 1934, January, June, September, and December of 1935, and March, June, September and December of the years 1936 through 1940. We calculated the sum for these months in each year and then estimated the sum in each state for the year by using the national share of CCC employment from those months for that year and then scaling the total up to an annual figure. The national information on monthly employment for 1933 through 1936 was determined from information on CCC employment in Appendix 9, pp. 557-558 of National Resources Planning Board, 1942). The monthly information on the number of workers enrolled from each state comes from mimeographed tables titled "Distribution of Members of the Civilian Conservation Corps by State in Which Enrolled, as of [the last day of the month]" for the months from October 1933 through March 1936. The information for the months June 1936 through December 1940 are from tables titled "Distribution of Personnel" from mimeographed copies of "Civilian Conservation Corps Monthly Statistical Summary." These mimeographs are found in the Civilian Conservation Corps Records at the National Archives II in College Park, Maryland. Record Group 35, Entry 46, "Operations Statistics Monthly Statistical Summary Issued by the CCC Director, 1936-1941," and "State Statistical Summaries ECW Covering Operations from April 1 1933 to August 31, 1936."

We can also add back the payroll taxes collected for social security and unemployment payroll taxes and for payments for the federal pension and unemployment programs for railroad workers. Information on tax collections for social security taxes, unemployment payroll taxes and taxes paid by railroad workers by fiscal year by state comes from Commissioner of Internal Revenue (1937, pp. 74-5, 1938, 80-81; 1939, 82-83; 1940, 84-85; 1941, 88-89). To convert to a calendar year basis, we used monthly information on the national tax collections to create shares of taxes collected in the July-December phase of the fiscal year and in the January to June phase. We then used these percentages to convert from a fiscal year to calendar year. To the extent that the six-month shares vary across states, this adds some

measurement error to the income measure. The variable that results after conversion is sspytxcy in annunemp.xls].

To add back the payments made by federal employees into the retirement fund, we don't have payments by state for this figure. We do have the national total from U.S. Statistical Abstract, 1943, p. 187 and from U.S. Civil Service Commission, 1940, p. 142. We also have estimates of the distribution by states and territories of civil employees of the Executive Branch of Government for 1936 through 1939 from U.S. Civil Service (1939, p. 159; 1940, p. 139).[xxv]   The correlations between the number of federal civil employees for 1936, 1937, 1938, and 1939 were all above .9937. We therefore used the average shares for the four years as the measure of the share of payroll paid by workers in each state for each year for the decade.

Measuring Government Spending

We have compiled a data set of the key components of federal spending and loans identified by the U.S. Office of Government Reports (OGR) (1939) between 1933 and 1939. Starting with the OGR data we then checked the spending in each category from 1933 and 1939 and then extended the data forward to 1940 and backward to 1930 using reports of the U.S. Treasury and many federal agencies.

The Path of Federal Spending in the States through 1932

Prior to the New Deal there were relatively few federal programs that distributed grants and loans to the states, local governments, or individuals within states. By the early 1920s the grants came in the form of federal highway grants to the states through the Department of Agriculture, public health grants for children under the Shephard-Townsend legislation; grants for state and city soldier and sailors homes; education grants to state agricultural and mechanical universities, for books for the blind, marine schools, and vocational education; grants under the Department of Agriculture to Experiment Stations and Extension Services. The Army Corps of Engineers was building, improving, and maintaining rivers and harbors and flood control works. The Veterans' Bureau was paying out pension and death payments to veterans or their dependents. There were also payments to replace lost property taxes to counties in Oregon associated with the Coos Bay wagon trail and to the state of Oregon for the loss of property taxes on land that the federal government had taken back over from the original Oregon and California Railroad land grant. Finally, there were payments to Oklahoma for gas and oil royalties.   The Shephard-Townsend grants for child public health wound down after 1930.

The Bureau of Reclamation was providing no interest loans for building dams and irrigation works and Boulder Dam had begun construction. In the paper we treated these as grant expenditures because the payments on the loans were often delayed for long periods of time and in a number of cases were forgiven.

The loans came in the form of Federal Land Bank mortgage loans to farmers and a series of special appropriations for emergency crop and feed loans. After 1926 loans were available to veterans based on collateral in the form of World War I Adjusted Service Certificates (ASCs) that would mature after 20 years from the date of receipt of the ASC.

Between the fiscal years 1929 and 1933 Congress and the Hoover Administration raised federal government outlays by 52 percent in nominal terms and 88 percent after adjusting for inflation. Mostly this came in the form of expansions of existing programs. In February 1932 the Reconstruction Finance Corporation was established and made a broad range of loans to financial institutions, industry, and lower levels of government.   Franklin Roosevelt and the Democratic Congress took office in early March, 1933 and introduced the broad range of programs seen in Table 1 of the paper. The Public Roads Administration took over the highway grants formerly distributed by the USDA and the Federal Credit Administration

Veterans' Bonus.

The World War I Veterans' Bonus that was associated with the Bonus Army March of 1931 and the cash payout in 1936 was based on an insurance certificate that would mature in the mid 1940s. Through 1936 World War I veterans could obtain loans against the certificates, which they did quite actively. In 1936 over Roosevelt's veto Congress passed a law that allowed cash payments on the certificates and thus a very large cash payout.

On May 19th, 1924, Congress enacted a law providing for adjusted service compensation for veterans of World War I. The act provided for a basic service credit of $1 per day served and a $1.25 for each day served overseas with a maximum credit of $625 for overseas service and $500 for home service. For veterans with credits less than $50 the payments would be made in cash. Otherwise, the veteran would receive an insurance certificate of the amount multiplied by 1.25 that would pay out the amount on the certificate at the end of 20 years. Apparently, the 25 percent increase was added to take into account the delayed nature of the payment. If the beneficiary died before 20 years, his beneficiary would receive the amount on the certificate (Veterans Bureau, 1924, p. 688).   In the original act, the veteran could borrow from banks or trust companies using the certificate as collateral an amount up to 90 percent of the present value of the certificate at the end of the year in which the loan was made using a discount rate of 4 percent and adjusting for likely mortality. This turned out to be about 40 percent of the value of a certificate maturing in 20 years. If the veteran failed to pay interest and the face value, the bank could receive payment from the Veterans' Bureau to cover the loan, and the certificate was passed to the Veterans' Bureau (Director of the U.S. Veterans' Bureau, 1924, pp. 688-672; 1932, p. 36). The interest rate on loans was established as 2 percent about the Federal rediscount rate for 60 days' paper in the Federal Reserve District where the loan was made. Many people ignore the life insurance value of the certificates that were issued. The Veteran's Administration suggested in 1932 that in 80 percent of the cases of veterans dying, the insurance payout from the ASC was the only material asset left to the dependents (Administrator of Veterans' Affairs, 1932, p. 36-37).

     Between 1925 and 1936 the Veterans' Bureau issued roughly 3.7 million adjusted-service certificates (ASCs) with maturity value of $3.69 billion. About $3.1 billion had been issued in certificates by June 30, 1926, while the rest trickled in over time as the deadline for application was consistently extended.

On March 3, 1927, Congress authorized the Veterans' Bureau to loan directly on the ASCs. By 1928, as seen in Table A-1, the Bureau nearly 700,000 veterans borrowed against their ascs. By 1930 the Veterans' Bureau had made about 2.4 million loans with a value of $215 million against the ASCs.

On Feb. 27, 1931 Congress passed Public No. 743 over Hoover's veto. It provided that the loan basis of the asc shall at no time be less than 50 percent of the face value of the asc after the certificate has been in effect for 2 years. The law also capped the maximum interest rate at 4.5 percent. The new law led to an explosion of new loans as the cumulative dollar value of loans on certificates rose from $215 million to nearly $1.1 billion (Administrator of Veterans' Affairs, 1931, pp. 10, 42-43). The loans had a nice feature that the veteran could forgo repayment and just allow the repayment plus accumulated interest to be taken out of the payment made when the certificate matured. The Veterans' Bureau estimated this would lead to a payout of about $188 for a a typical certificate (the average was roughly $1,000) on which 50 percent had been borrowed and no principal and interest repaid. Of course, the veteran received the intial $500 up front. A law of July 21, 1932 eliminated the two-year waiting period between issuance of the certificate and the loan and cut the maximum interest rate to 3.5 percent (Administrator of Veterans' Affairs (1932, pp. 10, 36-38). After the burst in 1931, the value of loans on the certificates rose by roughly $300-350 million in fiscal 1932 and 1933, declined some during as the recovery began and rose again until 1935.

Table A-1
Loans on World War I Adjusted-Service Certicates through June 30 of Fiscal Year

Fiscal Year Ending June 30	Cumulative Number of Loans on Certificates	Cumulative Dollar Value of Loans on Certificates	Change in Number of Loans on Certificates	Change in Value of Loans on Certificates	Cone's Estimate of Loans in Personal Income included in Personal Income
1927	689,805	64,433,625	689,805	64,433,625	

1928	757,706	73,884,775	67,901	9,451,150	
1929	1,429,946	133,653,488	672,240	59,768,713	
1930	2,357,697	215,435,144	927,751	81,781,656	
1931	2,265,345	1,087,195,525	-92,352	871,760,381	795,000,000
1932	2,584,582	1,396,042,679	319,237	308,847,154	181,000,000
1933	2,836,922	1,750,000,000	252,340	353,957,321	181,000,000
1934	2,884,504	1,614,220,289	47,582	-135,779,711	34,000,000
1935	2,904,525	1,679,669,884	20,021	65,449,595	24,000,000

Sources: Director of Veterans' Bureau. 1927, p. 44; 1928, 26-27; 1929, pp. 5, 30; 1930, pp. 30. Administrator of Veterans' Affairs, 1931, pp. 10, ; 1932, pp. 11, 36-68; 1933, pp. 24-25; 1934, pp. 28-29; 1935, pp. 22-23. Cone, 1940, p. 44.

      Frederick Cone (1940, 44) provided monthly estimates of loans on ASCs that he included as part of his estimates of personal income. Table A-1 lists the fiscal year totals of loans from 1931 through 1935. His amounts differ from the ones in the veterans' bureau reports, as he has no loans listed in fiscal year 1930. When the transition is made to grants and the loans paid off in 1936, his totals don't match the veterans' bureau totals. We used Cone's estimates for the ASCs to subtract out the ASCs from the personal income measures to obtain production income numbers. His calendar year totals after paying off loans in millions for 1936 are 1,427, for 1937 are $120, for 1938 are $58, and for 1939 are $34. He does not report a value for 1940.   In measuring grants and loans, we used the information from the Administrator of Veterans' Affairs Reports.

      We have been unable to find descriptions of the amount of the loans on ASCS or the value of the veterans' bonus on the ASCs in 1936 through 1941 by state for each year. However, there are several sources for specific years that give good descriptions of the share of World War I veterans in the states in several years.   The 1926 report of the Veterans' Bureau Administrator reported the distribution of the ASCs across states distributed to that time, but no reports were made after that.   By June 30, 1926 approximately 84 percent of the certificates had been issued. The 1930 Census reported the number of World War I veterans, and we used the Integrated Public Use Microdata Sample for 1930 to get an estimate of the number of World War I veterans in each state. We also have information on the number of living World War I veterans receiving pensions in 1934 through 1941 Director of Veterans' Bureau, 1926, pp. 312-313; Administrator of Veterans' Affairs, 1934, pp. 78-79; 1935, pp. 80-81; 1936, pp. 90-91; 1937; pp. 80-81; 1938, pp. 93-94 ; 1939, pp. 93-94; 1940, pp. 101-102; 1941, pp. 89-90. The correlations between the 1934 through 1941 numbers were all above .99. The correlations between the 1926 numbers and these numbers were in the 0.93 to 0.94 range, the correlations between the 1930 number and the 1934-1941 numbers were in the .92 range, which might be expected if people were moving around the country. We calculated the share of veterans in each state (taking into account veterans living elsewhere and in Washington, D.C in the total) in each year where we had information. For the years 1927 through 1929 and 1931 through 1933 we used straight-line interpolations of the shares between the values in 1926 , 1930, and 1934. We then multiplied the values by the national totals to get loan values for the ASCs in each state in 1927 through 1935 and by the cash payouts in 1936 through 1941.

      In response to pressure from veterans' groups, Congress overrode a Roosevelt veto on January 27, 1936 to create a new payment structure for the ASCs.   The World War I veterans could turn in the ASCs for payment of the face value in cash (the famed Veterans' Bonus) after their outstanding loans and accumulated interest to that date had been deducted. The veteran could also choose a bond dated June 15, 1936 to mature June 15, 1945 with interest at the rate of 3 percent per annum but no interest to be paid on any bond redeemed before June 15, 1937. As of June 30, 1936, during the life of the program, the veterans' bureau had issued a total 3,757,259 ASCs with a maturity value of $3.692 billion. Of these 231,109 had matured on account of death and $229.5 million had been awarded to the designated beneficiaries. This left 3.52 million certificates in force with maturity values of $3.462 billion. Payments of less than $50 had been made in 165,184 cases to the value of $5.206 million. Cash settlements were made to the beneficiaries of 135,615 veterans who died in service for an amount of $44.669 million.   After the passage of the 1936 act, the VA received 3.264 million applications for settlements of which 98.9

percent had been certified and the rest were in the process. The face value of the certificates was $3.206 billion. After deducting outstanding liens for loans the net value was $1.764 billion.

In constructing the data, we used the change in the cumulative value of the Veterans' Bureau's loans on the ASCs as the value of loans in each fiscal year through the end of fiscal year 1935. Hardly anybody held on to their loans after the passage of the cash opportunity in 1936. The issue arises as to how to treat the cash out of the veterans' bureau. We treated the full $3.206 billion in cash and bond payouts in fiscal year 1936 as a grant, while the value of loans was treated as a repayment with a value of minus $1,679,699,884 for that year. Additional cash disbursements were made of $282.6 million in fiscal 1937, $13.8 million in 1938, $7.4 million in 1939, $9.2 million in 1940, and $2.657 million in 1941 (Administrator of Veterans' Affairs 1941, p. 87.

Tennessee Valley Authority Spending

From examining the OGR figures for spending on rivers and harbors and the Bureau of Reclamation in Tennessee and Alabama, it is clear that the Tennessee Valley Authority expenditures on the construction of a series of Dams and Canals along the Tennessee River are not included. The TVA was a quasi-government corporation that was supposed to repay construction expenditures eventually with electric power revenues but these were very slow to repay the full bill. The expenditures were included in the Federal Budget expenditure figures listed in the Statistical Abstract of the United States in various years, so they likely belong as expenditures. Another reason to include them is that the Office of Government Reports included the Bureau of Reclamation expenditures on Dams and irrigation projects in their estimates. We constructed estimates of the expenditures on the TVA project, which started in fiscal year 1934 using information from the Federal budget line item for the TVA (U.S. Bureau of the Census, Statistical Abstract of the United States, 1935, p. 169, 1936, p. 170, 1937, p. 168, 1938, p. 174, 1939, p. 172, 1940 p. 198, 1941, p. 184, and 1942, p. 198) and from the TVA annual reports.

We divided up the line item for each year by projects using the TVA Annual Reports for the years 1935 through 1942. The TVA reported a net investment figure for each Dam project for the fiscal years 1934, 1935, 1936, and 1937 (Reports of 1935, pp. 63-68; 1936 123-129; 1937, 103-109). National defense and fertilizer net investments were all assigned to the Muscle Shoals, Alabama area. Mapping and future project expenditures were split evenly between Alabama and Tennessee. In 1938, the TVA began reporting the cumulative cost over the years for each of the following dams: Wilson, Norris, and Wheeler Dams. In 1939, Pickwick was added (TVA Annual Reports of 1938, pp. 20-26; 1939, 15-22). In 1940 an evaluation of the fixed assets for Wilson, Norris, Wheeler, Pickwick, Hiwassee, Guntersville, and Chickamauga was reported (Report of 1940, 61-63). The 1941 Report (pp. 41-43) then reported the cumulative cost again. Prior to 1939 the construction costs for Hiwassee, Guntersville, and Chickamauga were reported together. Using information on the amount of construction completed (Reports of 1938, pp. 20-26, 1939, 15-22, and 1940, p. 16-18) we could divide up the expenditures across the years. In late 1939 the TVA began reporting aggregate values of constructions o the Watts Bar and Kentucky Dam projects. We split the total expenditures evenly between the two projects through 1940 and then used information on the construction costs of the projects in 1941 (pp. 41-43) to calculate the differences. The annual estimates of expenditures from these various cumulative measures appear consistent with the narrative descriptions of the progress of construction on each project. In the process of developing the figures, a large estimate for Wilson dam in Muscle Shoals, Alabama appears for the first time in 1937. Wilson Dam was built before the 1930s and transferred to the TVA when it was started. A transfer value was not developed until 1937, and that is when it appears in the records. To get the final value for each state we added up the total annual expenditures for all projects and then calculated the ratio of the expenditures from the line item for the TVA in the federal expenditures to the total value we calculated. We then multiplied that ratio by the annual values we estimated in each state. A Table of Estimates of TVA Annual Spending by Project and State are available from the authors.

Extending the OGR Expenditures back to Fiscal Year 1930 and forward to Fiscal Year 1941.

We were able to extend the federal grant spending by state back to fiscal year 1930 and forward to fiscal year 1941 using information from the Annual Reports of the Treasury Department, which reported direct payments made to states under cooperative arrangements and grants to and expenditures within states

providing direct relief, work relief, and other aid, exclusive of loans (U.S. Department of Treasury, Annual Report,1930, 623-626; 1931, 566-569; 1932,443-446; 1933, 382-385 ; 1934, 397-401; 1935, 432-4351936, 474-477; 1937, 474-479; 1938, 520-531; 1939, pp. 519-525, 1940, 821-829, 1941, 651-659).   In the fiscal years 1934-1939 when both the OGR and Department of Treasury of estimates were both reported, the data by program matched up perfectly for the following programs for all years: Agricultural Experiment Stations, Agricultural Extensions works, Colleges of Agricultural and Mechanical Arts, Forest Funds, Forest Service Grants, Public Roads Administration (after summing across roads programs in Treasury reports), Mineral Lease Payments, Special Funds grants, Vocational Education and Rehabilitation Grants, Office of Education Grants, State Marine School Grants, Books for Blind Grants, Federal Water Power Grants, Soldier and Sailor Homes Grants, and National Guard Grants. All of these programs were programs that existed before, during, and after the New Deal.

Veterans' Bureau Spending

The Office of Government Reports reported Veterans' Administration expenditures aside from loans to living veterans on the World War I Adjusted Service Certificates prior to 1936 and the Veterans' Bonus payouts on the ASCs in 1936 and after for the years 1933 through 1939 by state. The expenditures included pension payouts for Navy and Army veterans, VA homes, Maintenance, military and naval insurance payouts for adjusted service certificates of less than $50 in cash and payments to dependents from ASCs where the veteran has died, We found that these matched the information reported by the Administrator of Veterans' Affairs in Annual Reports for 1934, pp. 78-83; 1935, pp. 80-85; 1936, pp. 90-95; 1937; pp. 80-85; 1938, pp. 93-98 ; 1939, pp. 93-98). We therefore used information from the 1940 and 1941 Reports to add the data for those years (1940, pp. 101-106; 1941, pp. 89-94). The distributions across states in each year were pretty stable with pair-wise correlations between one year and the next of .98 or higher throughout the period from 1933 through 1941.

For the period 1928 through 1932 the Veterans' Administration reported national expenditures for the period prior to 1933 but did not report the total spending by state. For the years 1932 and 1931, the veterans' administration reports the number of pensioners on the rolls and the value of the pensions to be paid by state. This does not represent all of the types of funds for the VA grants used in the data set from 1933 to 1939.   We also have the number of veterans reported by state in the Census in 1930 from the Integrated Public Use Microdata Sample (IPUMS). The correlations across states between these measures and the 1933 veterans' bureau spending were .952 between the 1933 distribution and the IPUMS distribution for 1930 and .94 between the share of pensioners in 1932 and 1931 with the veterans' Bureau payments in 1933.   In the measure we used in the analysis we used the shares of the national totals from the IPUMS data in 1930 and the shares for the VA spending in 1933 and developed estimates of the shares in 1932, 1931, 1929, and 1928 using straight-line interpolations.   We then multiplied the national totals after subtracting out spending that is covered in other categories (spending on state and territorial homes, vocational training, government life insurance, seamen's insurance, allotments and allowances, loans to vets for transportation, medical and hospital services, and miscellaneous factors).   The national totals were $546,255,828 in 1932, $695,951676 in 1931, $626,485,964 in 1932, $620,504,069 in 1929, and $611,396,308 in 1928 (calculated from Veterans Administrator, 1934, p. 76, Table 40) We made the adjustments to the national totals after comparing totals for 1934 with the OGR reports.

The U.S. Employment Service grants reported by the OGR were much bigger than those reported by the Treasury. For example, the OGR reported a total for the U.S. of $24.556 million, while the Treasury reported $4 million. However, the Treasury figures for 1940 look more like the OGR figures. In fact, they were substantially larger than the 1939 OGR figures at a total around $60 million. They then fall off markedly to $3.1 million in 1940. We looked at the Monthly Labor Review reports on public employment agencies and we cannot explain this sudden rise and fall. Relative to the total spending in those years, the fluctuations would be in the neighborhood of 1.5 percent of total spending in 1939. No grants were listed prior to fiscal year 1934, but we know that the U.S. Employment Service operated in the early 1930s with a few offices and a small staff in several states. Based on the descriptions of the size of the offices and their tasks, we do not believe the expenditures were larger than $30,000 in those states prior to 1934. U.S. Department of Labor, "Public Employment Services," Monthly Labor Review (January 1931): 10-32. We chose to leave a value of zero for the U.S. employment service prior to 1934.

Among major New Deal programs, the Agricultural Adjustment Administration OGR and Treasury values matched in 1939 and there were small differences in 1938, and 1937, and no listings in 1934-1936 in the Treasury Reports. The Civilian Conservation Corps matched perfectly in 1937 and 1938, the treasury reports were 1.18 times the OGR reported amount in each state in 1939.

The Public Works Administration total for non-federal and for federal grants matched up with the total in the Treasury in 1939. However, comparisons of the Treasury information with information from the First and Second Annual Reports of the Federal Works Administrator shows that the Treasury only reported the grants for non-federal projects in 1940 and 1941. We filled in the grants for federal projects from PWA expenditures from Federal Works Agency. *First Annual Report, 1940*, pp. 328-329 and the *Second Annual Report*, 1941, pp. 318-19.

For the Works Progress Administration, the sum of the Treasury's National Youth Administration and the WPA matched in 1939 and the sums were off a little in 1936, 1937, and 1938. The WPA figures from the OGR matched exactly the WPA annual reports of federal expenditures from WPA, *Report on the Progress of the Works Progress Administration*, various years. In 1940 and 1941 the Treasury expenditures were slightly larger than the WPA expenditures reported in the Federal Works Agency, *Second Annual Report, 1941*, pp. 452-453, and *First Annual Report, 1940*, pp. 436-437.
The Federal Emergency Administration Grants in the OGR and Treasury Reports matched in 1935, 1937, 1938, and 1939 and differed slightly in 1936. The FERA expenditures were not listed in the Treasury Reports of 1934, so no comparisons could be made between the OGR and Treasury Reports that year.

The Social Security Administration Expenditures reported by the OGR matched the Treasury Reports and the grants listed for fiscal 1936 and 1937 in the Social Security Board's *Second Annual Report of the Social Security Board, 1937,* pp. 99-100. These included grants for old-age assistance (74 percent of total in 1937) , aid to the blind (2.8%), aid to dependent children (14.8%), unemployment compensation administration (5.5%), as well as Department of Labor grants for maternal and child health services (1.8%), services for crippled children (1.2%), and child welfare services (0.6%), and Treasury department grants for public health work (4.6%).   The OGR reports had lower totals in 1938 and 1939 than those listed in the Treasury reports, while the Treasury reports listed in 1938 and 1939 matched exactly the reported amounts in the Social Security Board's *Fourth Annual Report of the Social Security Board, 1939,* pp. 195-196. We therefore used the Treasury and Social Security grant estimates for 1938 and 1939 instead of the OGR estimates.

The Treasury Department figures for the Farm Security Administration were similar to the OGR figures for 1938, but were much larger in 1937 and 1939.   It appears that the Treasury was including the value of FSA loans in the grant figures. For 1940 and 1941 we adjusted the Treasury figures downward based on the ratio of the OGR grant in 1939 to the Treasury listing in 1939.

The Public Building Administration spending is not reported in the Treasury Reports until 1940 but is reported in the OGR Reports. The data for the OGR matches up exactly for 1934 with the data reported for the Public Buildings Administration in Federal Works Agency, *Annual Report, 1940*, pp. 264-265, and are similar in most other years. The Treasury data for 1940 are similar to and strongly correlated with the data reported in the Federal Works Agency *Annual Report, 1940* , pp. 264-265. There are some substantial differences between the Treasury and the Federal Works Agency report in 1941 (Federal Works Agency, *Annual Report, 1941* pp. 247).

One of the main questions to address is how to deal with the Spending on construction of dams and irrigation projects by the Bureau of Reclamation. Technically, all Bureau of Reclamation projects were interest-free loans to the users of the irrigation works or the electric works associated with dams. However, the repayments on the loans were generally delayed and in a number of cases the scheduled payments were pushed back even further. This was particularly true during the 1930s.   On some projects the loans were forgiven. Thus, a case could be made that the Bureau of Reclamation spending could be treated as similar to grants. Certainly, in terms of net flow of funds they lie somewhere in between the non-repayable grants of the WPA and the loans with repayment schedules. The OGR reports Bureau of Reclamation grant spending. These estimates in most cases are pretty similar to estimates of construction costs reported

separately in the annual reports of the Bureau of Reclamation after the construction spending for the Boulder Dam project (begun in fiscal year 1931), the All-American Canal (begun in fiscal year 1935), and the Marshall Ford Dam (Mansfield after 1941 and begun in fiscal year 1938) are added to the construction statistics listed in the Bureau of Reclamation Annual Reports (see Bureau of Reclamation, *Annual Reports for the Fiscal Year* for the period 1921 through 1932 and the U.S. Secretary of Interior *Annual Reports for the Fiscal Year* for the period 1933 through 1941).

We constructed two different versions of the Bureau of Reclamation spending. In one we used the OGR estimates of Bureau of Reclamation grant spending for fiscal years 1934 through 1939 and then added in estimates using the Bureau of Reclamation Construction Spending for fiscal years 1930 through 1933 and 1940 and 1941 plus construction spending for the Boulder Canyon Project, the All-American Canal and the Marshall Ford Dam. These were added because it was clear from comparisons during 1934 through 1939 of the spending by state listed by the OGR and Reclamation Bureau that those three projects were included in the OGR estimates but not the Reclamation Bureau estimates. The Reclamation Bureau reported separate accounting for the Boulder Canyon projects and the All-American Canal in their reports (Secretary of Interior 1933; pp. 40-1; 1934, pp. 50-51; 1935, pp. 80-81; 1936, pp. 84-85; 1937, pp. 28-29; 1938, pp. 77-79; 1939, pp. 225-227; 1940, pp. 120-122; 1941, pp. 45-47).

In a second set of estimates we used the Bureau of Reclamation Report estimates of spending plus the spending on the Boulder Canyon Project, the All-American Canal and the Marshal Ford Dam. We constructed estimates of Boulder Canyon spending from the following material. For the fiscal years 1934 through 1940 the Reclamation Bureau reported accounting summaries for the Boulder Canyon Project that showed an estimate of fixed capital under construction and also total cumulative disbursements by the fiscal agents of the project. For Boulder Canyon the difference between the two cumulative numbers was roughly $8 million out of around $60 million total in 1934 and 1935 and $3 million thereafter, for percentage differences of 13.6 in 1934, 9.3 in 1935, 5.6 in 1936, 3.3 in 1937, 2.7 in 1937, 2.3 in 1938, and 1.7 in 1939. The same figures were provided for the All-American Canal from 1935 through 1940. The differences were 142,000 in 1935 and less than 850,000 thereafter with percentage differences of 6.3 in 1935, 12.3 in 1936, 5 in 1937, 2.6 in 1938, 2.3 in 1939 and 3 in 1940 (U.S. Secretary of the Interior 1934, pp. 54-56; 1935, 84-87; 1936, 88-92; 1937, pp. 30-33; 1938, pp. 80-83; 1939, pp. 228-231; 1940, pp. 123-126). For fiscal year 1941 we used the appropriations estimates reported in U.S. Secretary of Interior 1941, pp. 32-33 for Boulder Canyon and listed on p. 557 in the U.S. Department of Treasury, Budget of the United States, 1942, printed in 1943). For the Boulder Canyon Project, the Bureau of Reclamation (1932, p. 88) provided an estimate of cumulative construction costs by the end of fiscal year 1932 of $21,745,004. And information on expenditures in fiscal year 1931 suggests that roughly $5.5 million was spent on constructing railroads, highways, Boulder City, and electric transmission lines that year (about $3.1 million on railways, $300,000 on highways, $1.5 million on transmission lines, and $600,000 on the initial parts of Boulder City (U.S. Bureau of Reclamation 1948, 84-85). To get an estimate of cumulative construction costs in 1933, we subtracted the line item amount of $19,526,000 for the Boulder Canyon Project in the Treasury report on expenditures of (U.S. Census Bureau, *Statistical Abstract,*, 1935, p. 170) from the 1934 estimate. The spending for the All American Canal was allocated to California and the Boulder Canyon project was split evenly between Arizona and Nevada because it sits astride their border. The split seems to be the way the OGR also allocated the Boulder Canyon funds.

For the Marshall Ford Dam for the years 1935 through 1939, we used the estimates for the Bureau of Reclamation provided by the Office of Government Reports for Texas. The Bureau of Reclamation reported no construction estimates for Texas during the period and we had no separate information on the Marshall Ford dam prior to 1941. For 1941 we used a figure of $3 million that came from an appropriations request by Roosevelt for Marshall Ford Dam in 1941. For 1940 we assumed a figure of $ 4 million based on the decline in annual spending between 1939 and 1941. Marshall Ford Dam was allocated to Texas.

Estimated Annual Spending for Fiscal Years		
Boulder Canyon Dam	All American Canal	Marshall Ford Dam

Fiscal Year	Based on		Based on		Based on OGR and appropriations
	Disbursements	Capital Under Construction	Disbursements	Capital Under Construction	
1930	0	0	0	0	
1931	5,500,000	5,500,000	0	0	
1932	14,640,028	14,640,028	0	0	
1933	13,682,429	22,106,181	0	0	
1934	19,526,000	19,526,000	0	0	
1935	21,965,333	21,313,868	2,248,138	2,105,904	0
1936	18,896,056	16,719,814	4,332,560	5,287,203	555,731
1937	7,792,162	5,630,729	8,580,700	8,549,162	796,291
1938	6,076,856	5,608,865	7,769,657	7,576,826	5,569,261
1939	5,407,545	5,082,650	3,018,729	3,035,664	5,255,993
1940	4,693,698	4,050,808	1,910,080	2,152,418	4,000,000
1941	6,500,000	6,500,000	1,500,000	1,500,000	3,000,000

Rivers, Harbors, and Flood Control

The Office of Government Reports offered estimates of spending on rivers and harbors and flood control by the Army Corps of Engineers for the fiscal years 1933 through 1939. To push these estimates back to 1928 and forward to 1941 we examined the reports of the Chief of Engineers, U.S. Army, *Annual Report of the Chief of Engineers* for the years 1920 through 1941. The reports listed the net expenditures by project from the Chief of Engineers budgets as well as separate estimates of net spending from budgets provided under the National Industrial Recovery Act through the Public Works Administration and from budgets provided by the Federal Emergency Relief Acts. We found that a number of the state expenditures did not match up well for 1933; therefore, we also created an alternative estimate for the rivers and harbors spending based on the annual reports. Some projects were associated with multiple states, like the various subdistricts of the Mississippi River and subdistricts of the Ohio River. In the cases where we could identify specific locations within the subdistricts we used the amounts spent in those locations to divide the spending between states. In situations where specific information was not available we divided the expenditures based on rough estimates of the mileage of the rivers measured with maps and rulers. In most of the districts the spending was not divided by project for the following types of spending: preliminary examinations and reports, plant allotments, preliminary examinations and reports for flood control and plant allotments for flood control. For the first two we distributed the spending on those categories across states based on the spending in the district on the projects in the states in that year. For the third and fourth categories we distributed the spending based on the state distribution of flood control projects. The expenditures we use are net expenditures after net receipts from sales are subtracted. We treated negative values as zeroes in this situation on the grounds that when the area had negative net expenditures, they were not pulling money out of the area.

The sources for Public Works Administration loans in fiscal years 1940 and 1941 are Federal Works Agency, 1940, pp. 328-329 and 1941, 318-319. These were loans on non-federal projects. Negative numbers means that bonds were cancelled in lieu of payments.

Splitting the Reconstruction Finance Corporation Loans between fiscal 1932 and fiscal 1933.

We used information from Reconstruction Finance Corporation (1932, pp. 3-4 and 1933, pp. 8-9, 14-15) to perform the splits. The RFC did not report the total loans by state for fiscal year 1932 or for fiscal year 1933 in their monthly and quarterly reports of 1932 and 1933. They did report the number of borrowers by state for fiscal year 1932 for each category: banks and trust companies, credit unions, building and loan association, insurance companies, mortgage-loan companies, joint-stock land banks, livestock credit corporations, agricultural credit corporations and railroads (including receivers). In the 1933 report they reported the cumulative number of borrowers in the categories above plus the additional categories under the expanded range for the RFC after June 1932. The added categories included Federal Land Banks, Federal Intermediate Credit Banks, Regional Agricultural Credit Corporations, Self-liquidating projects, Financing of Agricultural Commodities and Livestock, Relief and Work Relief, Loans on Preferred Stock of Banks, and Purchases of Capital Notes and Debentures of Bonds. Using this information we determined the number of borrowers (B_{32js}) in each category (j) in each state (s) as of June 30, 1932 (*32*) and the additional borrowers added in fiscal year 1933 (B_{33js}). The two reports also reported the total loans in each category as of June 30, 1932 and June 30, 1933. From that information we determined the value of loans of loans in each fiscal year for loans.   We calculated the average loan size for each category of loan (l_{32j})

$$l_{32j} = L_{32j}/\Sigma_s\ B_{32js}.$$

Σ_s is the summation sign over all states s.

To get an estimate of the amount of loans in state s in 1932 (EL_{32s}) we multiplied the number of borrowers in the state in each category (B_{32js}) by the national average loan size (l_{32j}) and then summed across all categories.

$$EL_{32s} = \Sigma_j\ l_{32j} * B_{32js}$$

We followed the same procedure for each state in 1933.

$$EL_{33s} = \Sigma_j\ l_{33j} * B_{33js}$$

The proportion of loans in state *s* from February 2, 1932 to June 30, 1933 that was in fiscal year 1932 (P_{32s}) is then

$$P_{32s} = EL_{32s}/ (EL_{32s} + EL_{33s}).$$

This was then multiplied by the reported amount of loans from the Office of Government Reports to get the 1932 figure.   The RFC reported Loans allotted, the amount disbursed, the amount repaid, and the amount outstanding.   The Office of Government Reports appears to have used loans outstanding in their reports, so we used that definition here.

ENDNOTES

[1]See series Ea584, Ea585, and Ea586 in Wallis (2006, 5-80 and 5-81). The federal fiscal year ran from July 1 in year t-1 to June 30 in year t. Nearly all of the decisions made about fiscal year 1933 were made by the Hoover administration and Congress. Roosevelt did not take office until early March 1933 and very little of the New Deal spending occurred before July 1, 1933.

[2] The variation is even larger when Delaware is added. We left Delaware off the graph to better show the spread across states visually, as Delaware reported federal tax receipts more than $100 per capita higher than in the next highest states.

[3] Blanchard, Perotti (2002), p. 1363.

[4] Meanwhile, Ohanian (1997) develops a simulation of the military buildup and policies for the Korean war but talks in terms of welfare rather than output measures.

[5] Munnell (1992 192) finds a significant effect of public capital on state-level output, investment and employment growth, although the effects of government spending at the state level are smaller than at

the national level. Garcia-Mila and McGuire (1992) constructed a panel of 48 states from 1969 until 1983 to estimate input elasticity coefficients of regional Cobb-Douglas production functions and concluded that government provided goods, such as highways and education, have a significant and positive effect on state's output. Costa, Ellison, and Martin (1987) consider a translog production function and conclude that public capital and labor are complementary inputs. The estimated elasticities of output with respect to public are around one in all states. Meanwhile, Blanchard and Katz (1992) model the effects of negative one-percent employment shocks to a wide range of variables using data from U.S. states from 1947 to 1990 and find sizeable effects on per capita income over an extended number of years.

Duffy-Deno and Eberts (1991) study the effect of the public capital stock on the state's economic growth, first, without using capital expenditures as a proxy for capital stock, and second, considering public capital both exogenous to the firm and endogenous to the local community positing a simultaneous relationship of public capital and local economic growth. The authors find a positive and statistically significant effect of public capital on state's economic growth rate.

Assessing a link between public capital and economic growth, Fernald (1999) studies the direction of causation between public capital and productivity and unsurprisingly concludes that road construction (which is one of the biggest components of public spending) causes a surge in productivity in industries with high motor-vehicle use. David Aschauer (1989) also finds that road construction bears the most explanatory power of the change of local productivity, while military spending has almost none.

[6] Richardson (1985) surveys all but the neoclassical models. Merrifeld (1987 and 1990) and McGregor, McVittie, Swales, and Yin (2000) for examples of neoclassical multipliers for the economic base.

[7] We focus on the studies that use panel data here, see Neumann, Fishback, and Kantor (2010) for citations to studies relying on cross-sectional estimation.

[8] Cone (1940, p. 8) made the following argument for inclusion of the World War I veterans' loans and then 1936 cash payout on adjusted service certificates as personal income. "Prior to June 1936 payments to World War veterans took the form of cash loans on the security of their adjusted service certificates; in that month the Federal Government, in discharge of its obligations on amount of adjusted service legislation, remitted to the veterans more than $2,000,000,000 worth of adjusted service bonds and some cash. The larger portion of these bonds were liquidated during the year 1936, but the Treasury has been redeeming them in smaller amounts during the past 3 years; the present rate is about $2,000,000 a month. More properly , then, the payments to veterans represent in the first instance loans on existing assets and in the second the gradual liquidation of these assets rather than the actual payment of income as here defined. Nevertheless, because these disbursements of the Federal Government were in the nature of original receipts to the veterans and because, owing to the large volume of the disbursements and their wide distribution among 3,000,000 veterans, they represented an important stimulus to consumption on two distinct occasions, they have been incorporated into the monthly series."

[9] We are almost finished with coming up with a measure of income that adds back the payroll taxes and subtracts direct relief to come closer to modern definitions used by scholars.

[10] The broad-based index includes manufacturing wages only; mining wages only; street railways; telephone and telegraph; electric light, power, and gas; insurance; brokerage; wholesale and retail trade; year-round hotels; and laundry and dry-cleaning establishments.

[11] The Office of Government Reports offered information on the value of housing loans insured by the Federal Housing Administration. Since these loans were private loans, we do not incorporate these into the analysis of net federal spending.

[12] AAA grants per capita were not very strongly correlated with processing tax receipts in cross-sectional correlations. The correlation for 1934 was only 0.034 and for 1935 was 0.1677.

[13] There were some cases of loan forgiveness. In the case we know about, the RFC loans offered to cities for poverty relief under the Hoover administration in fiscal year 1933 were eventually forgiven by the Roosevelt administration. The HOLC likely experienced the highest loan default rate because it foreclosed on 20 percent of the mortgages that it supported. Our sense from reading the reports of the various agencies, is that they anticipated repayment and were active in seeking repayment or recovery of assets to be sold when there was a default.

[14] The Commodity Credit Corporation loan program provided nonrecourse loans that established a price floor for the commodities produced. The CCC loan information has been eliminated from the

analysis because the loans were not reported across states in fiscal 1934 and major portions of the loans were not reported across states in other years.

[15]The intuitive discussion of the multiplier is based on a Keynesian discussion of consumption and imports. See Cullen and Fishback (2007) and Fishback, Horrace, and Kantor (2005b) for how this works in a simple model.   The regional science literature offers a broad array of models that can produce multipliers based on the mix of local versus external consumption and or production. They include Keynesian models, economic base models, input-output models and neoclassical models. Richardson (1985) surveys all but the neoclassical models. See Merrifeld (1987 and 1990) and McGregor, McVittie, Swales, and Yin (2000) for examples of neoclassical multipliers.

[16] Households did not begin paying income taxes before income hit $2,000 for individuals and $5,000 for a family of four at a time when most workers were earning $1,000 or less.

[17] We have also tried estimating the model while including squared terms. The estimates at the mean of the sample are very similar and there is very little gain from adding the squared terms. In addition, the instruments did not have adequate strength to separate the coefficients for the squared terms.

[18]The federal government stopped collecting the annual information from states for the volume *Financial Statistics of the States* in 1933 after having collected information from 41 states for 1932. They restarted by collecting the data for 1937 (U.S. Bureau of the Census 1940, p. vi).   John Wallis, Richard Sylla, and John Legler have posted information for 16 states for the period 1933 through 1937 with the ICPSR, but it is taking longer than we anticipated to make the data for these states comparable with the federal government's categories. Working with John Wallis we are collecting, computerizing, and categorizing the information for the remaining states for 1933 through 1937 and for the seven states in 1932 that the Census Bureau had not worked with.

[19] As an example, the instrument for the year 1932 would include the standard deviation of the percent voting for the Democratic presidential candidate from 1896 through 1928.

[20] For the Mid-Atlantic states the area used for the instrument does not include any states from New England, the Mid-Atlantic, the East North Central, the South Atlantic, or the states of Alabama, Georgia, Kentucky, Maryland, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. The area used for the instrument for the East North Central states does not include any states from the Mid-Atlantic, the East North Central, the West North Central, or the states of Alabama, Arkansas, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, or West Virginia.   The area used for the instrument for the West North Central states does not include any states from the East North Central, the West North Central, the East South Central, the West South Central, and the Mountain States.   The area used for the instrument for the South Atlantic states does not include any states from the Mid-Atlantic, the South Atlantic, the East North Central, the East South Central, or the West South Central. The area used for the instrument for the East South Central does not include any states from the Mid-Atlantic, the South Atlantic, the East North Central, the East South Central, the West South Central, or the states of Iowa, Kansas, Missouri, or Nebraska.   The area used for the instrument for the West South Central states does not include any states from the East North Central, the West North Central, the East South Central, the West South Central, or Mountain regions. The area used for the instrument for the Mountain states does not include any states from the West North Central, the West South Central, the Mountain, or the Pacific regions. The area used for the instrument for the Pacific states does not include any states from the Mountain and Pacific regions or the states of Oklahoma, Texas, Kansas, North and South Dakota, and Nebraska.

The results were similar although the instrument was weaker when we created an instrument where we used three regions of the country.   The first region is all states east of the states on the eastern border of the Mississippi River, and the states used for the instrument were the Mountain and Pacific states and the states of Kansas, Nebraska, North and South Dakota, and Oklahoma.   The second region is all states west of the states that are on the western side of the Mississippi River; so the states used for the instrument were states east of the states on the eastern side of the Mississippi River. The third region was the states along the Mississippi River. The states used for the instrument were from the New England, Mid-Atlantic, Pacific, and Mountain regions.

[21] If the federal government had established a hard budget constraint nationwide, there might have been a negative relationship between spending in the rest of the regions and spending in the state in question. There did not appear to be a hard spending constraint at the national level because Roosevelt and the Congress often approved additional funds throughout the years and ran budget deficits in most years.

[22]The policy was designed to raise prices for farmers. The negative effect on real personal income from the price rise was likely to have been felt nationwide for crops with national markets. This change would have led to a rise in the CPI and a reduction in real income nationwide that would show up in the coefficients of the year dummies. In that sense, the multiplier estimate will be overstated. There may have been differential effects within states due to differences in the consumer prices based on distance between farmgate and final market. Much of this effect would be control for by the state fixed effects. For some crops that sold in local markets, like corn and hay, the local prices might have risen more than at the national level with the reduction in output as long as they stayed within a price range set by transportation costs to other markets (Fox, Fishback, Rhode, forthcoming). This localized rise would show up in the measure of state personal income but the effect of the rise in limiting purchasing power would not because we have not adjusted for localized differences in the cost of living. Here again the multiplier effect will be slightly overstated.

[23]It is possible that the statistically insignificant effect of government spending on manufacturing payrolls might reflect the fact that most manufacturing was selling to national and international markets. If so, a rise in federal spending within a state would only stimulate the demand in that state, which might be a small share of the demand for the product. We checked this hypothesis by estimating the impact of spending on manufacturing payrolls in the bread industry for the years 1929, 1931, 1933, 1935, and 1937. The bread industry was found in every state and tended to sell locally. The bread industry results also show small and statistically insignificant effects of federal spending. The dollar-for-dollar effects 0.2 cents per dollar spent, while the elasticities are smaller than the elasticities reported for manufacturing payrolls per capita in Table 4. The findings for the bread industry are therefore inconsistent with the idea that the small effects on manufacturing are being driven by the dispersed nature of manufacturing consumption.

[24]We put all measures on a per capita basis for consistency. We have also estimated the models for the payrolls and employment without putting them on a per capita basis and the magnitudes of the results are only slightly larger.

[xxv]The Works Progress Administration (1936, p. 88) reported employment for 1935 by states not including the WPA and CCC, but this matched up poorly with the figures from the Civil Service commission reports for 1936 through 1939. We also have estimates of the number of people in service from each state in apportioned positions at Washington, D.C. from U.S. Civil Service (1932, p. 148; 1937, p. 87; 1939, p. 160-1; 1940, p. 140). There was no reported information from the annual report in 1941. The cross-sectional correlation between the number of employees and the apportioned group is 0.8577 in 1936, .889 in 1937, 0.887 in 1938, and .8997 in 1939.