Federal, State, and Local Governments: Evaluating their Separate Roles in US Growth *

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Abstract: We use US county level data (3,058 observations) from 1970 to 1998 to explore the relationship between economic growth and the extent of government employment at three levels: federal, state and local. We find that increases in federal, state and local government employments are all negatively associated with economic growth. We find no evidence that government is more efficient at more decentralized levels. While we cannot separate out the productive and redistributive services of government, we document that the county-level income distribution became slightly wider from 1970 to 1998. For those who justify government activities in terms of equity concerns – perhaps even trading off economic growth for equity – the burden falls on them to show that the income distribution *would have widened more* in the absence of government activities. We conclude that a release of government-employed labor inputs to the private sector would be growth-enhancing.

JEL Codes: O40, O11, O18, O51, R11, H50, and H70

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1. Introduction

Does government contribute to or hinder economic growth? This question is of considerable interest to economists and is the subject of a large empirical literature. However, *government* is a very broad concept. A more appropriate and tractable question is: *what kinds* of government contribute to or hinder economic growth? To address this question, we revisit and extend a number of results from Higgins et al.'s (2006) study of US growth determination. In that paper we use county-level data to assess the roles of federal, state, and local government, separately, in growth determination from 1970 to 1998. The analysis focuses on *levels of centralization* as the relevant *kinds* of government. Nearly all of the evidence that we present in Higgins et al. (2006) suggests that government, at any level, hinders economic growth. Furthermore, there is no evidence that government's negative effect on growth diminishes at more decentralized levels.

In this paper we report how the basic Higgins et al. (2006) findings are largely robust to examining (a) subsamples of metro and non-metro counties separately, (b) regional subsamples, and (c) individual US state subsamples. We also (d) employ a more careful selection of valid instruments for our regressions. The basic findings are again robust. We also include documentation that (e) the county-level income distribution widened slightly over the 1970 to 1998 period.

Our 2006 paper primarily focuses on conditional convergence rates in the US. Determinants of balanced growth paths are given second-order treatment in terms of detail and space. This paper allows us to highlight findings associated with the government employment variable subset of those growth determinants. We find that subset of particular interest and the elaboration of our original findings along the margins of (a) through (e) provides, we believe, a stronger and more thorough argument that government activities are growth-hindering in the US.

The paper is organized as follows. Section 2 elaborates on the questions of interest in terms of the existing literature and how we add to that literature. Section 3 then briefly discusses the econometric method and data that we employ. Section 4 discusses the empirical findings. Concluding remarks are made in Section 5.

2. Growth and Government: The Existing Literature

When asking about *kinds* of US government there are two complementary (and not mutually exclusive) categorizations of interest. One categorization is *kinds of government services and inputs to production* and has received considerable attention in the literature. A seminal example is Aschauer (1989) who analyzes government military and non-military investment, finding that only non-military government investment is positively associated with state-level economic growth. Alternatively, Holtz-Eakin (1994) finds that government investment has a negative effect or no effect on gross state product (GSP) growth. Evans and Karras (1994) confirm the Holtz-Eakin result even when considering investments in highways, water and sewer capital, and other infrastructure capital separately.[1] However, Evans and Karras also find that increases in government educational services are positively related to growth.[2] A more recent paper by Shioji (2001) revisits the effects of different types of government investment. He finds that the

[1] Garcia-Milà et al. (1996) confirm these results. Lynde and Richmond (1993), to the contrary, use a translog production function specification and find that government investment contributes to output growth while the government capital stock contributes to productivity growth.
[2] On the other hand, changes in highway services, health and hospital services, police and fire services, and sewer and sanitation services do not have statistically significant effects.

infrastructure component has a positive effect on growth.[3]

The categorization we explore – namely *kinds of government in terms of the level of decentralization* – has not received as much attention in the literature. In a sample of 58 countries, an early paper by Oates (1972) finds that measures of *fiscal decentralization* (henceforth simply *decentralization*) positively correlate with real income per capita.[4] Davoodi and Zou (1998), on the other hand, find that decentralization is negatively associated with growth in developing countries, and not associated with growth in developed countries.

The literature is especially sparse in regards to the US economy.[5] Three notable exceptions are Xie et al. (1999) who fail to find a relationship between decentralization and per capita income growth from 1948 to 1994 and Akai and Sakata (2002) and Stansel (2005) who find positive relationships between decentralization and growth.[6] Xie et al. (1999) focus on the share of local and state government in aggregate government expenditures. Akai and Sakata (2002) analyze expenditure and revenue shares of federal, state and local governments in state-level cross-section data. Finally, Stansel (2005)

[3] Different kinds of government services and inputs to production are also a common focus of cross-country studies. Examples include Atkinson (1995), Slemrod (1995), Agel et al. (1997), Sala-i-Martin (1997a and 1997b), and Baldacci et al. (2004).

[4] Despite Oates (1972) empirical finding, the relationship between economic growth and fiscal decentralization in general cannot be directly linked to the more specific "decentralization theorem" put forth by Oates in the same work. The decentralization theorem concerns the welfare advantages of localized public goods provision in the absence of "cost-savings from centralized provision" and "interjurisdictional externalities" (p. 72). The theorem only establishes "a presumption in favor of the decentralized provision of public goods with localized effects" (Oates, 1999, p. 1122). Difficult questions involve, first, whether this implies a presumption that decentralization positively correlates with growth and, second, whether the assumptions underlying that presumption actually hold in a given economy.

[5] Studies specific to countries other than the US include Carrion-i-Silvestre et al. (2008) for Spain and Zhang and Zhou (1998) for China.

[6] For succinct overview of fiscal decentralization, see the introduction section of Brueckner (2006). See also, Hillman (2003). Martinez-Vazquez and McNab (2003) provides an insightful view of both the theoretical and empirical literature on fiscal decentralization.

examines the central city share of population, per capita municipalities, and per capita counties.

Our analysis complements the above studies. We focus on federal, state, and local government *employment as a percent of a county's population*. Our analysis of employment shares is novel in terms of both (i) the underlying concept of the public sector (or the dimensions of the public sector measured) and (ii) the economic unit of analysis (i.e., a county). Employment shares come from the county-level data that Higgins et al. (2006, 2008) and Young et al. (2008) exploit to study convergence in the US. In contrast to the 48-50 state-level observations, or the 314 metropolitan areas studied by Stansel (2005), our data contain over 3,000 county-level observations.

Employment shares may provide a better measure of many government activities than expenditure shares do. They capture percentages of available labor input that are being directed by a specific level of the public sector (rather than by the decisions of private individuals and firms). To the extent that economically important government activities are labor-intensive, analyzing the effects of employment shares is of interest. For example, regulatory environments are presumably inherently labor-intensive in that they are not effective without investigative monitoring and enforcement on the ground.[7]

Moreover, the large number of cross-sectional observations allows us to study the US as a whole as well as various sub-samples of interest. Metro and non-metro sub-samples allow for the possibility that government's effect on economic growth varies with population density and provides a link to the metro area study of Stansel (2005).

[7] There are, of course, also advantages to expenditure shares relative to employment shares. For government activities that are *not* labor intensive (e.g., industry subsidies) or for which associated labor is contracted for from the private sector (e.g., highway construction), expenditure shares may be a more appropriate measure.

For instance, a higher population density may lead to negative externalities that the public sector is uniquely suited to deal with. Furthermore, regional and individual state samples (the later of which Higgins et al. 2006 and 2008 do not explore) allow for the possibility of heterogeneity of institutions and cultures that are conducive to, or foster, relatively good or bad government (in terms of growth-determination). For example, the general view of what activities government should pursue may be very different in different regions of the country. This carries over to the federal level if individual states request, allow, and/or encourage different types of federal activities. In that case, the effects of government on growth may be significantly different.

Our analysis incorporates 38 variables (as well as state-dummies for the nation-wide samples) on which to condition the growth rates of per capita income. These variables control for the effects of various levels of educational attainment, age, racial demographics, and industry composition.

Following Higgins et al. (2006), we use a cross-sectional variant of the 3SLS-IV approach of Evans (1997). However, we improve upon Higgins et al. (2006) in terms of the instruments used. Higgins et al. (2006) employed lagged values of all conditioning variables as instruments. We employ an algorithm that chooses from those lagged values a set of instruments that (i) are valid and (ii) have the highest Shea partial R^2.

3. Empirical specification and data

In this section we briefly describe the basic growth regression model and the estimation technique that we apply. We then briefly describe the US county-level data. Finally, since our estimation technique employs instrumental variables, we describe the algorithm that we use to optimally choose a set of instruments conditional on the available data.

3.1. The regression model and 3SLS-IV estimation procedure

Our growth regressions involve fitting cross-sectional data to the equation,

$$g_n = \alpha + \beta y_{n0} + \gamma' x_n + \nu_n \,, \tag{1}$$

where g_n is the average growth rate of per capita income for economy *n* between years 0 and *T*; y_{n0} is initial (t = 0) per capita income; x_n is a vector of other control variables including government employment shares; β and γ are coefficients; and ν_n is a zero mean, finite variance error term.[8] Given our data, 0 ≡ 1970 and T ≡ 1998.[9]

Caselli, et al. (1996) and Evans (1997) show that applying OLS to (1) will yield consistent estimates only if the data satisfy highly implausible conditions.[10] Evans (1997) proposes a 3SLS-IV method that produces consistent estimates. In the first two stages, instrumental variables are used to estimate the regression equation,

$$\Delta g_n = \omega + \beta \Delta y_{n0} + \eta_n \,, \tag{2}$$

where $\Delta g_n = \frac{(y_{n,T} - y_{n,0})}{T} - \frac{(y_{n,T-1} - y_{n,-1})}{T}$, $\Delta y_{n0} = y_{n0} - y_{n,-1}$, y_n , ω is a parameter, and η_n is the error.[11,12]

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[8] For a derivation of this regression from a neoclassical growth model, see Barro and Sala-i-Martin (1992). For exposition of this model in greater detail see Higgins et al. (2006).

[9] Though the period of growth under consideration is 28 years, the analysis is essentially cross-sectional because average growth over those 28 years is the single dependent variable.

[10] For a list of these conditions see Higgins et al. (2006) and Evans (1997).

[11] An immediate concern with the use of (2) is the reliance on the information from the single difference in the level of income (1969 to 1970) to explain the difference in average growth rates over overlapping time periods (1969 to 1997 and 1970 to 1998). Given that the growth determination is a stochastic process, the potential problem is basically one of a high noise to signal ratio. We are relying on large degrees of

Next, we use β^*, the estimate from (2), to construct the variable,

(3) $$\pi_n = g_n - \beta^* y_{n0}\,.$$

In the third stage, we perform an OLS regression of π_n on x_n:

(4) $$\pi_n = \tau + \gamma x_n + \varepsilon_n\,,$$

where τ and γ are parameters and ε_n is the error term. This regression yields a consistent estimator, γ^*.

3.2. US county-level data

The data we use are drawn from several sources but the majority comes from the Bureau of Economic Analysis Regional Economic Information System (BEA-REIS) and US Census data sets. The BEA-REIS data are largely based on the 1970, 1980 and 1990 decennial Census files; the 1972, 1977, 1982 and 1987 Census of Governments; and the Census Bureau's City and County Book from various years. We exclude military personnel from all data.

Our data contain 3,058 county-level observations. The large number of observations allows us to explore possible heterogeneity in growth across the US by splitting the data into three sets of subsamples. The first set includes a metro subsample

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freedom to alleviate this problem and identify coefficients. Indeed, we obtain statistically significant β estimates for the full sample as well as for 32 individual states.

[12] As Evans (1997) shows, the derivation of this equation depends on the assumption that the x_n variables are constant during the time frame considered, allowing them to be differenced out. Since the difference is only over a single year and these are variables representing broad demographic trends, this does not seem to be unwarranted. To make sure that this did not introduce significant omitted variable bias into our estimations, we ran the IV regression for the full US sample with differenced values of all conditioning variables included as regressors. The point estimate of β from the modified IV fell within the 95 percent confidence interval of the Evans method IV estimate. If β estimates are not significantly affected then neither are the third stage results (see below).

(867 counties) and a non-metro subsample (2,191 counties).[13] The second set includes 5 regional subsamples: Great Lakes, Northeast, Southern, Plains, and Western. Finally, the third set includes 50 US state subsamples.

We use the BEA's measure of personal income net of government transfers expressed in 1992 dollars. Natural logs of real per capita income are used. The 38 conditioning variables are the same as in Higgins et al. (2006, see Table 1) and account for various age and racial demographics, levels of educational attainment, and industry employment composition.[14] For the variables of interest to the present analysis, **Table 1** reports some summary statistics for the various samples of US counties. The variables are average per capita income growth from 1970 to 1998 and federal, state, and local government employments as a percents of a county's population.

3.3. Choice of Instruments

Higgins et al. (2006) used lagged values of conditioning variables as instruments for $\Delta y_{n,0}$ in equation (2). A basic criticism of that paper is that no evidence was presented of those instruments' validity. It is well-known that a valid set of instruments includes variables that are correlated with the endogenous regressors (instrument relevance) but uncorrelated with the error term of the regression (instrument orthogonality). For a given set of instruments, an F-statistic test can be used to assess the former while overidentification tests can be used to assess the latter.

In the case of a single endogenous regressor, such as the case with $\Delta y_{n,0}$ in equation (2), Staiger and Stock (1997) have suggested declaring instruments to be weak

[13] Metro counties are defined as those that contain cities with populations of 100,000 or more, or border such counties (Higgins et al. 2006)
[14] An appendix at the end of Higgins et al. (2006) describes the data in more detail.

(not relevant) if the first-stage F-statistic is less than ten (Stock and Yogo, 2002). This "rule of thumb" for testing instrument relevance is supported by Baum et al. (2003). In regard to instrument orthogonality, Deaton (1997) and Stock and Yogo (2002) point out that when several instruments are used, overidentification tests can be applied. In the present case we use Sargan's (1964) overidentification test to assess whether the instruments are correlated with the error process.[15]

Given the size of our sample and number of independent variables we have a large number of potential instruments. In order to generate a set of valid instruments (i.e, those that address instrument relevance and orthogonality) we apply an algorithm that (i) selects various combinations of available (lagged) conditioning variables such that the system is overidentified, (ii) tests their validity, and (iii) if found valid, uses them in the regression analysis. Our algorithm does not maximize any particular function but rather aids in sifting through all various combinations of valid instruments (i.e., those where the first-stage F-statistic is greater than 10 *and* that satisfy the Sargan test). From this subset of valid instruments we selected the set that produced the largest first-stage Shea (1997) partial R^2, 0.3510. Our final set of instruments consists of the following 13 lagged variables: "Age: 18-64 years", "Education: Bachelor +", "Federal government employment", "State government employment", "Local government employment", "Self-employment", "Agriculture", "Construction", "Manufacturing: durables", "Manufacturing: non-durables", "Health services", "Personal services", and "Entertainment & Recreational Services".[16]

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[15] For Sargan's test see also Wooldridge (2001).
[16] All of these variables are in terms of percents of a county's population. See Higgins et al. (2006, Table 1) for full definitions of these variables and data sources.

4. Empirical findings

We begin by presenting our empirical estimates of the effect of federal, state, and local government employment (as a percent of a county's population), separately, on US economic growth at the county-level. Estimates are presented for (a) country-wide samples, including metro and non-metro subsamples, (b) regional subsamples, and (c) individual state subsamples. We also informally consider the redistributive role of government which may account for the lack of positive growth effects of government employment.

4.1. Full US sample results

Table 2 presents the estimation results for the full US sample, as well as metro and non-metro samples. We find a negative and statistically significant partial correlation between the percent of the population employed by government and the rate of economic growth, regardless of whether one considers federal, state or local government. The coefficients for federal, state and local government employment percent of the population variables are –0.0226, –0.0153, and –0.0219 respectively, all significant at the 1-percent level. There is no clear pattern in the point estimates as the level of decentralization increases, and the 95 percent confidence intervals of the point estimates are overlapping.[17]

[17] The relationship may, however, be nonlinear. Government expansion may promote growth but only up to a point when further expansion is detrimental to growth at the margin; or it may be the case that government expansion aims to enhancing growth up to a point, and then expansion beyond that point aims at income redistribution (Buchanan and Wagner, 1977). To check this, we run the full US sample regression including both linear and quadratic government employment share terms. Only for the federal employment share is the quadratic term positive and significant, but the parameter estimates imply that the marginal effect is negative up until the federal government employs over 30 percent of a county's

The negative effects are also present at all levels of government employment whether one considers only metro counties or only non-metro counties as indicated by the figures in **Table 2**. This suggests that government employment is not positively related to economic growth at higher population densities. Indeed the negative partial correlations are larger for the metro sample than for the non-metro sample at all levels.

Given the apparent robustness of a negative association of government employment with growth, one interpretation is that federal, state and local government activities misallocate resources into relatively (compared to the private sector) inferior production processes. Government lowers total factor productivity, thus lowering balanced growth paths. However, another interpretation may be entertained. Perhaps non-government wage growth outpaces government wage growth, and this drives the results.[18] These interpretations are not incompatible in a world where both government and non-government wages approximated marginal products. However, government employment, not being subject to the same market forces, may be different along certain intangible margins (e.g., greater job security; lower expectations of effort; higher psychic benefits associated with providing a public service).

In order to explore the above we have assembled government and non-government wage growth data for the sample period (**Table 3**). At the state and federal level, non-government wages outpace government wages in approximately 55 percent (a small majority) of all counties. At the local level, non-government wages grew faster in only about 30 percent of counties. Relative sluggishness of government wages at the state and federal levels is dominated by wage growth rates in the metro counties. For the non-

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population; the total effect is negative until it employs over 60 percent! (In the data, however, only 9 out of 3,058 counties have a federal government employment share in excess of 30 percent.)

[18] We thank Paul Rubin for bringing this possibility to our attention.

metro counties, which constitute a vast majority of 2,196 counties panel, non-government wages outpaced government wages in just over 50 percent of cases.[19]

If a relatively sluggish growth of government wages story were important, then we would expect to find smaller estimated coefficients for metro counties than for non-metro counties. This we do see. The coefficient estimates for the regression including only metro counties are –0.0300, –0.0264 and –0.0214 for federal, state and local governments respectively. For non-metro counties the corresponding estimates are –0.0179, –0.0081 and –0.0128. Note, however, that this pattern holds for the local government coefficients as well, despite local wages outpacing non-government wages in a majority of counties. At least at the most decentralized level of government, a relatively sluggish government wage growth story is unable to account for the negative partial correlation. Indeed, we find a negative relationship *despite the relatively fast growth of government wages*.

4.2. Regional Results and Individual State Results

Table 4 reports the results for our five regional sub-samples: Great Lakes, Northeastern, Southern, Plains and Western. Statistically significant results are harder to come by using these smaller samples, but those significant coefficient estimates are broadly consistent with our full sample findings. The significant coefficient estimates are all negative except for those associated with the non-metro Plains region. For the non-metro Plains region, notably, positive effects are estimated for all levels of government. The statistically significant coefficient estimates that are negative occur, variously, for

[19] These results are based on data from 3,066 counties. Our regression analysis utilizes data for 3,058 counties. The difference is due to a lack of some data in eight counties.

federal, state, and local government.[20]

Table 5 reports the estimates for 32 of 50 individual US state sub-samples.[21] Again, these results are broadly consistent with the conclusion that government employment, at all levels, is negatively correlated with economic growth. Almost all statistically significant effects are negative. The notable exception is North Dakota. North Dakota has large, statistically significant positive coefficients on federal and local government employment.

It is not immediately apparent what might be peculiar about North Dakota. For example, in 1970, North Dakota ranked 21st highest in terms of federal government employment (1.3 percent); 7th in terms of state government employment (2.3 percent); and 4th in terms of local government employment (4.7 percent). However, similar to the Plains region non-metro case, federal, state, and local government wage growth was higher than non-government wage growth in, respectively, about 57 percent, 75 percent, and 85 percent of counties. This exceptional government relative wage growth may account for the estimated positive effect of government employment on income growth. (Of course, this could simply imply that government activity productivity growth was relatively high.)

4.3. Redistributive Activities

It is possible that the negative correlation between government employment and

[20] The non-metro Plains region effects may be associated with relatively fast government wage growth. Federal, state, and local government wage growth, respectively, outpaced non-government wage growth in approximately 62 percent, 68 percent, and 80.32 percent of counties.
[21] Given the extensive number of independent variables, our model was only identified in 32 of 50 states. By this we refer to the coefficient on initial income being statistically significant. In the absence of this the interpretation of conditioning variable coefficients is unclear.

economic growth is due to the redistributive activities of government. Redistributive activities may be detrimental towards average (per capita) income growth though effective in their specific goals. Furthermore, if greater income equality is valued in and of itself, then trading off growth for equity may be viewed as desirable.

Our analysis cannot separate out the productive and redistributive activities of federal, state, or local governments. However, under the hypothesis that the negative correlation between government employment and economic growth is due to redistributive activities, we can ask whether or not the economic growth has indeed been traded off for a more equitable distribution of income. In other words, we can evaluate a possible redistributive role for the various levels of government *given the caveat* that we can not control for how the distribution of income might have evolved in the absence of government. (Clearly this caveat is an important one.)

Young et al. (2008) provide evidence on this issue; here we briefly summarize their results. **Figure 1** displays the 1970 and 1998 distributions of per capita income across US states. The distribution became wider. Also, the Gini coefficients associated with US counties' 1970 and 1998 (log) incomes are 0.0167 and 0.0165 respectively – a decrease of about 1.2 percent.[22] At the county-level, although the dispersion of US per capita income widened from 1970 to 1998, it became a bit more equal.[23] However, changes in both the standard deviation and the Gini coefficient are small enough to suggest that changes in both dispersion and equality are negligible.

To try to understand further the evolution of the US county-level income distribution, **Table 6** summarizes statistics computed from the 1970 and 1998 income

[22] The Gini coefficient is a number between 0 (perfect equality) and 1 (perfect inequality).
[23] This statement is not to be confused with one concerning the distribution of US *individuals' incomes.*

distributions. From 1970 to 1998, the skewness of the distribution increased from -0.2244 (to the left) to 1.7240 (to the right). At the same time, kurtosis increased from 3.4334 to 10.3237, implying that the distribution has become more peaked. Cumulatively, this suggests that these two effects have been offsetting to a great extent.

In conclusion, the evidence presented in Young et al. (2008) does not suggest that government activities have achieved (absolutely) a more equal distribution of income at the expense of lower rates of economic growth. Put differently, it suggests government failure at federal, state, and local levels *in lieu of* evidence that the distribution of county-level per capita income would have widened significantly in the absence of government activities.

5. Concluding Remarks

We use US county data containing over 3,000 cross-sectional observations during the period 1970 to 1998 to explore the relationships between economic growth and the size and scope of government at three levels: federal, state and local. In contrast to the extant literature that has used taxes, government expenditures and government capital stocks to proxy for the extent of government, here we focus on government employment shares.

Following Higgins, et al. (2006), we use a 3SLS-IV estimation technique and report on the full sample of US counties, as well as metro and non-metro subsamples, and 5 regional and 32 individual state subsamples. Federal, state and local government employment shares almost always negatively correlate with growth (when statistical significance holds) across samples.

We find no evidence that government is more effective at more or less decentralized levels. Furthermore, while we cannot separate out the productive and redistributive services of government, we document that income inequality in the US has widened slightly from 1970 to1998. However, the change in both the standard deviation of per capita income and the Gini coefficient are small enough to suggest that both dispersion and equality remained essentially the same.

Given the ostensible goals of higher growth and/or a more equitable distribution of income, our findings are not supportive of expanding the roles of government, in terms of employment, at any level. While government is often invoked as a solution to market failures, the evidence points to government failure as a more important, and negative, influence in the economy. Our findings suggest a rolling back of government activities; specifically for a release of government-employed labor inputs to the private sector.

The most important and obvious caveat to our findings is that we cannot disaggregate government employment into specific government activities, e.g. infrastructure development. Despite examining federal, state, and local government separately, we must view each level of government as a given package of activities and services. Still, our results are consistent with the conclusion that, as currently composed, a shrinking of government at any and all levels of decentralization would be a desireable policy.

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TABLES

Table 1 Summary Statistics

Samples	Counties	Growth Mean	σ	Federal Mean	σ	State Mean	σ	Local Mean	σ
U.S. - Full	3058	0.0154	0.0067	0.0396	0.0402	0.0485	0.0470	0.0835	0.0289
U.S. - Metro	867	0.0167	0.0062	0.0430	0.0429	0.0495	0.0508	0.0785	0.0233
U.S. - Non-Metro	2192	0.0149	0.0068	0.0382	0.0389	0.0482	0.0455	0.0855	0.0306
Great Lakes - Full	435	0.0148	0.0045	0.0265	0.0238	0.0404	0.0466	0.0782	0.0220
Great Lakes - Metro	140	0.0160	0.0045	0.0235	0.0187	0.0349	0.0390	0.0697	0.0109
Great Lakes - Non-Metro	295	0.0142	0.0044	0.0279	0.0259	0.0430	0.0496	0.0822	0.0247
New England - Full	244	0.0159	0.0050	0.0365	0.0382	0.0513	0.0361	0.0759	0.0209
New England - Metro	90	0.0166	0.0056	0.0302	0.0206	0.0381	0.0278	0.0793	0.0200
New England - Non-Metro	154	0.0154	0.0046	0.0401	0.0451	0.0591	0.0381	0.0740	0.0212
Plains - Full	832	0.0139	0.0075	0.0382	0.0388	0.0392	0.0457	0.0979	0.0318
Plains - Metro	143	0.0171	0.0052	0.0469	0.0548	0.0447	0.0438	0.0857	0.0248
Plains - Non-Metro	689	0.0133	0.0077	0.0363	0.0343	0.0380	0.0460	0.1004	0.0325
Southern - Full	1009	0.0184	0.0053	0.0414	0.0398	0.0527	0.0435	0.0726	0.0220
Southern - Metro	252	0.0200	0.0055	0.0486	0.0495	0.0515	0.0503	0.0709	0.0185
Southern - Non-Metro	757	0.0179	0.0051	0.0390	0.0357	0.0530	0.0410	0.0732	0.0230
Western - Full	538	0.0123	0.0075	0.0503	0.0499	0.0606	0.0558	0.0895	0.0325
Western - Metro	242	0.0134	0.0065	0.0509	0.0396	0.0627	0.0631	0.0868	0.0284
Western - Non-Metro	296	0.0114	0.0082	0.0498	0.0571	0.0588	0.0490	0.0916	0.0354

"Growth" is per capita income growth from 1970 to 1998. Government variables are employment shares of total population. σ is the standard deviation

TABLES (Cont.)

Table 2 Estimated effects of government on growth: US-wide samples

Sample	Variable	Coefficient (Standard error)
Entire US	Federal government employment	-0.0252[a] (0.0051)
	State government employment	-0.0153[a] (0.0040)
	Local government employment	-0.0219[a] (0.0052)
Metro counties	Federal government employment	-0.0305[a] (0.0108)
	State government employment	-0.0249[a] (0.0076)
	Local government employment	-0.0240[a] (0.0052)
Non-metro counties	Federal government employment	-0.0206[a] (0.0060)
	State government employment	-0.0056 (0.0048)
	Local government employment	-0.0145[a] (0.0059)

Significance levels are indicated by "a" for 1 percent, "b" for 5 percent, and "c" for 10 percent.

TABLES (Cont.)

Table 3 Estimated effects of government on growth: US-wide samples

Sample	Level of government	Percent of counties where government wages grew faster than non-government wages
Entire US	Federal government employment	44.36
	State government employment	45.37
	Local government employment	70.35
Metro counties	Federal government employment	34.14
	State government employment	38.85
	Local government employment	58.16
Non-metro counties	Federal government employment	48.41
	State government employment	47.95
	Local government employment	75.18

Non-government wages are the sum of private and farm wages.

TABLES (Cont.)

Table 4 Estimated effects of government on growth: US regional samples

Sample	Variable	Coefficient (Stand. error) Great Lakes	Northeast	Plains	Southern	Western
Number of Counties		435	244	832	1,009	538
Entire US	Federal	-0.0086[b]	-0.0263	-0.0223[b]	-0.0241[a]	-0.0149
		(0.0159)	(0.0212)	(0.0101)	(0.0091)	(0.0109)
	State	-0.0211[b]	-0.0118	0.0100	-0.0048	-0.0104
		(0.0100)	(0.0139)	(0.0075)	(0.0076)	(0.0097)
	Local	-0.0377[a]	-0.0372	0.0031	0.0036	-0.0309[a]
		(0.0135)	(0.0271)	(0.0084)	(0.0113)	(0.0119)
Number of Counties		140	90	143	252	242
Metro	Federal	0.0109	0.0195	-0.0121	-0.0392[b]	-0.0117
		(0.0344)	(0.0345)	(0.0286)	(0.0211)	(0.0219)
	State	-0.0203	-0.0162	-0.0358[b]	-0.0166	-0.0163
		(0.0214)	(0.0288)	(0.0154)	(0.0180)	(0.0158)
	Local	-0.0325	-0.1024[c]	-0.0086	0.0067	-0.0391[c]
		(0.0398)	(0.0571)	(0.0225)	(0.0353)	(0.0221)
Number of Counties		295	154	689	757	296
Non-metro	Federal	0.0055	-0.0286	0.0187[c]	-0.0158	-0.0104
		(0.0201)	(0.0260)	(0.0102)	(0.0104)	(0.0147)
	State	-0.0238[b]	0.0024	0.0161[c]	-0.0035	-0.0066
		(0.0120)	(0.0158)	(0.0092)	(0.0086)	(0.0151)
	Local	-0.0356[b]	-0.0453	0.0187[c]	0.0096	-0.0335[c]
		(0.0151)	(0.0345)	(0.0102)	(0.0118)	(0.0171)

Significance levels are indicated by “a” for 1 percent, “b” for 5 percent, and “c” for 10 percent.

Table 5 Estimated effects of government on growth: individual US state samples

State	Coefficient (std. err.)					
	Federal		State		Local	
Alabama	0.0383	(0.0543)	-0.0130	(0.0482)	0.0377	(0.0536)
Arkansas	-0.0153	(0.0499)	-0.0435	(0.0364)	-0.0385	(0.0443)
California	0.0337[c]	(0.0292)	0.0275	(0.0399)	0.0334	(0.0651)
Colorado	-0.0631[c]	(0.0358)	-0.0627	(0.0420)	-0.0224	(0.0361)
Florida	0.0254	(0.0740)	0.0039	(0.0560)	-0.0217	(0.0868)
Georgia	-0.0094	(0.0353)	0.0038	(0.0235)	0.0149	(0.0302)
Idaho	-0.1187[c]	(0.0569)	0.0439	(0.0331)	0.0453	(0.0685)
Illinois	0.0403	(0.0328)	-0.0101	(0.0189)	-0.0011	(0.0239)
Indiana	-0.0695	(0.0498)	0.0025	(0.0231)	-0.0357	(0.0351)
Iowa	0.0633	(0.0398)	-0.0479[b]	(0.0207)	0.0269	(0.0283)
Kansas	0.0272	(0.0413)	0.0157	(0.0169)	0.0119	(0.0175)
Kentucky	-0.0189	(0.0226)	-0.0037	(0.0200)	-0.0075	(0.0261)
Louisiana	-0.0182	(0.0376)	-0.0207	(0.0353)	-0.1758[a]	(0.0633)
Michigan	0.0714	(0.0492)	-0.0629[b]	(0.0270)	-0.0331	(0.0341)
Minnesota	-0.0384	(0.0604)	-0.0102	(0.0232)	-0.0247	(0.0237)
Mississippi	0.0060	(0.0630)	-0.0525	(0.0488)	-0.1657[a]	(0.0614)
Missouri	-0.1032[a]	(0.0348)	-0.0779[a]	(0.0264)	-0.0194	(0.0324)
Montana	-0.1149	(0.0718)	-0.0422	(0.0474)	-0.0161	(0.0478)
New York	0.0942	(0.1194)	0.0518	(0.0439)	0.0077	(0.0669)
North Carolina	-0.2145[a]	(0.0694)	-0.0621[b]	(0.0309)	-0.0165	(0.0682)
North Dakota	0.2524[c]	(0.1416)	0.1183	(0.1023)	0.2537[b]	(0.1173)
Ohio	-0.0233	(0.0569)	-0.0316	(0.0235)	-0.0205	(0.0470)
Oklahoma	-0.1013[c]	(0.0529)	-0.0654[c]	(0.0352)	-0.0903[b]	(0.0370)
Pennsylvania	0.0170	(0.0613)	0.0252	(0.0258)	-0.1347[b]	(0.0605)
South Carolina	-0.0169	(0.0795)	-0.0692	(0.0957)	-0.0189	(0.1069)
South Dakota	-0.0297	(0.0458)	0.0093	(0.0342)	-0.0410	(0.0439)
Tennessee	-0.0039	(0.0360)	-0.0731[b]	(0.0361)	0.0072	(0.0390)
Texas	-0.0442	(0.0301)	0.0035	(0.0174)	-0.0285	(0.0214)
Virginia	-0.0161	(0.0411)	-0.0139	(0.0427)	0.0218	(0.0539)
Washington	-0.0295	(0.0651)	-0.0662	(0.1226)	-0.1478	(0.2310)
West Virginia	0.0858	(0.0717)	0.0146	(0.0354)	-0.0255	(0.0811)
Wisconsin	0.0156	(0.0332)	-0.0199	(0.0311)	0.0466	(0.0348)

Significance levels are indicated by “a” for 1 percent, “b” for 5 percent, and “c” for 10 percent.

TABLES (Cont.)

Table 6 Summary statistics for the distribution of US county (log) per-capita income

Statistic	1970	1998
Standard deviation	0.2728	0.2887
Gini Coefficient	0.1666	0.1654
Skewness	-0.2244	1.7240
Kurtosis	3.4334	10.3237

FIGURES

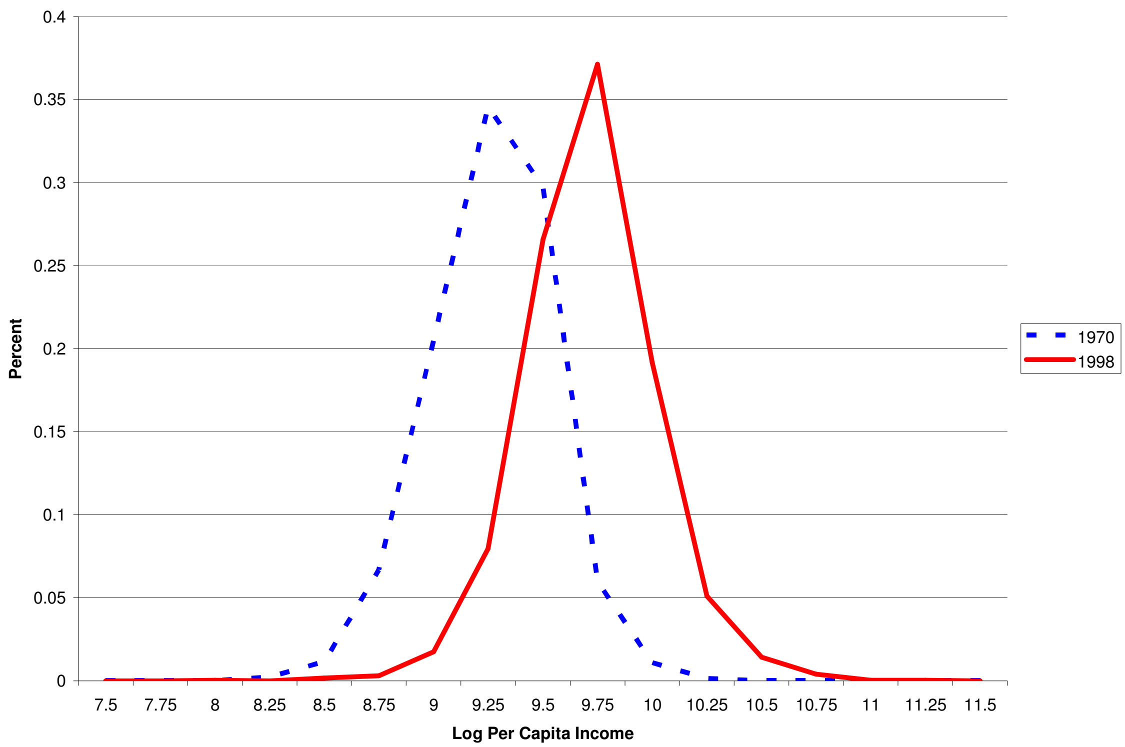

Fig. 1 Distribution of US county (log) per-capita incomes, 1970 and 1998

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