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Fiscal Centralization: Theory and Evidence from the Great Depression[†]

By DANIELE COEN-PIRANI AND MICHAEL WOOLEY*

The Great Depression produced a profound and lasting influence on the structure of US government. This paper studies theoretically and empirically the increased centralization of revenues and expenditures by the states relative to local governments during this period. A model of property and sales taxation and tax delinquency is introduced. In the model, the income decline of the Depression causes a rise in property tax delinquency and leads to a shift toward sales taxation and fiscal centralization by the states. Empirical evidence based on cross-state variation in the severity of the Depression is consistent with the model's key predictions. (JEL E32, H25, H71, H72, H77, N12, N42)

The Great Depression produced a profound and lasting influence on the size and structure of US government. The size of the government grew as programs in areas like social insurance were expanded. Its structure also changed, as the federal government grew in importance relative to its state and local counterparts. For example, the federal government's share of non-defense expenditures went from about 27 percent on the eve of the Great Depression to almost 45 percent on the eve of World War II in 1940. The big losers in this period were local governments—cities, counties, school districts—whose share of expenditures fell dramatically from about 54 percent in 1927 to 31 percent in 1940.¹

While the New Deal and associated policies are usually credited with the rise of the federal government in this period (Rockoff 1998), a less well-known but important development of the 1930s was the rise of state governments relative to local governments (for an earlier paper on this topic see Wallis 1984, discussed below). Between 1927 and 1940, state governments' share of combined state and

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¹Here and in the rest of the paper we define expenditures to include both direct and indirect expenditures of a given level of government. Indirect expenditures include intergovernmental grants to other levels of government. Expenditures exclude grants received from other levels of government. The numbers cited in this paragraph and the next are based on our computations using data from the *Historical Statistics of the U.S.* (Wallis 2006, tables Ea171–219, Ea396–456, Ea530–583). We use 1927 as a reference point because it is the last pre-Depression year for which data on government finances is available.

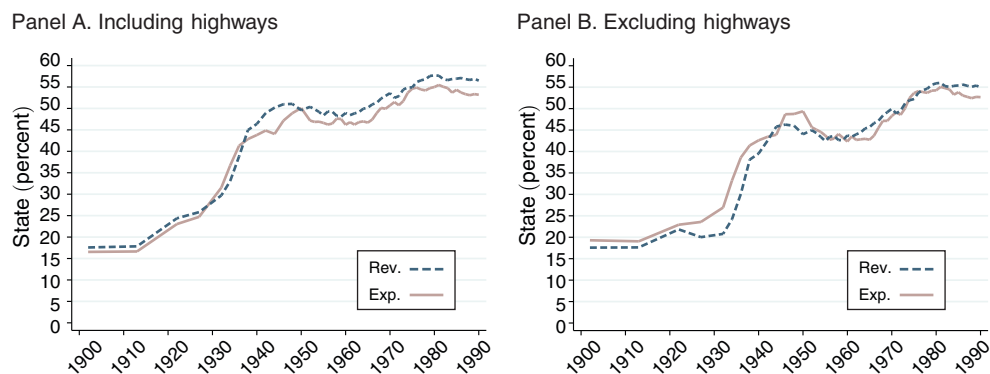


FIGURE 1. STATES' SHARE OF TOTAL STATE AND LOCAL REVENUE AND EXPENDITURES

Notes: Highway revenues are defined as motor fuel taxes and fees from motor vehicle and operators' licenses. Own revenue refers to total revenue less revenue from intergovernmental grants. Expenditures are defined in footnote 1.

Source: Wallace (2006, tables Ea348–384, Ea396–456, Ea489–518, Ea530–583)

local expenditures and revenues increased, on average, by 19 and 21 percentage points, respectively. Figure 1 shows the evolution of state governments' share of combined state and local own revenue and expenditure. Figure 1, panel A shows that the states' share of both variables had been increasing starting in 1913. However, panel B of Figure 1 makes it clear that much of this early increase is attributable to rising expenditures and revenue collections for new roads and highways associated with the advent of the automobile (Wallis 2001). The Great Depression clearly stands out as a period of rapid centralization of revenue and expenditures by state governments.

The process of fiscal centralization by state governments is important beyond its historical interest because the new fiscal arrangements that emerged from the Great Depression were long-lasting and still exert a powerful influence on today's world. Two of these long-lasting developments are worth mentioning at the outset. First, general sales taxes, which now represent the single most important source of revenues for state governments (US Census Bureau 2012), were first introduced in the United States by 28 states during the Depression. Second, the current involvement of state governments in elementary and secondary education funding has its origins in the Great Depression. As of 1929, local governments accounted for 83 percent of education revenue, with the states providing the rest. The share of funding coming from the states increased dramatically during the 1930s, reaching 30 percent in 1939 and 40 percent in 1949. The further expansion of states' funding share after the mid-1970s is dwarfed by the increase that occurred during the 1930s (Snyder 1993, figure 12).

In this paper, we seek to explain the rise of state governments during the 1930s. In doing so, the paper makes two contributions to the topic of fiscal centralization. First, it presents a novel *positive* theory of centralization, which is used to interpret the events of the Depression. As such, our paper complements the mostly *normative* literature on fiscal federalism (see, e.g., Oates 1972, Besley and Coate 2003). The

second contribution of the paper is to test empirically some of the key implications of the theory using data on US states.

Our explanation of fiscal centralization is based on the observation that, at the onset of the Great Depression, the property tax was the primary tax used by local governments to fund their expenditures, providing about two-thirds of their own tax revenue.² Local governments' heavy reliance on the property tax made them particularly sensitive to the sharp and sudden income decline at the onset of the Great Depression. When the Depression hit, incomes fell further and faster than property tax levies, leading to a large increase in property tax delinquency rates. In 1933 more than a quarter of property taxes levied in cities with a population greater than 50,000 were delinquent (Beito 1989). This crisis in the ability of local governments to collect taxes provided the impetus toward the introduction of general sales taxes. The latter, which "originated as an emergency source of revenue" (Shoup 1936, 110), provided some practical advantages to policymakers scrambling for new sources of revenue in the worst months of the Great Depression. An important advantage was that "the great bulk of dollar volume of sales is concentrated in relatively few establishments" so "it is possible to collect a very large percentage of the potential revenue with costs of administration between 2 and 4 percent of the tax receipts" (Shoup 1936, 108). Thus, tax delinquency was much less of a problem with sales taxes but it was only cost-effective for state or national governments to collect these levies (Nechyba 1997). Sales and gross receipts taxes accounted for about 6 percent of all state and local revenues in 1927 and 18 percent in 1940. This growth corresponds to about 60 percent of the increase in revenue centralization from 1927 to 1940.

We embed these ideas in a simple model of public good provision financed by property and indirect taxation. The tax mix selected by the benevolent government reflects the trade-offs associated with these two tax instruments. Property taxes are transformed more efficiently into public goods than indirect taxes, reflecting the prevalence of local provision in the pre-Depression era. However, property tax delinquency is an option available to the agents in the model, limiting the feasibility of property taxation as their income declines.

Our theory produces three main empirical predictions that are tested by exploiting the variation in the extent of the decline in income across states at the onset of the Great Depression. First, the theory predicts that states with larger income declines are more likely to introduce general sales taxes. Consistent with this prediction, we find that states that experienced a larger decline in income between 1929 and 1932 were more likely to introduce a sales tax during the 1930s. Moreover, we find evidence that the introduction of sales taxes was associated with rising discontent over property taxation: states with larger income declines in 1929–1932 were also more likely to pass blanket property tax limitation referenda.³ Second, our model predicts

²By contrast, at the onset of the Depression the property tax accounted for only 17 percent of states' revenue (Wallis 2001, table 4). The states relied, instead, on excises, fees, and, to a much lesser extent, income taxation. Individual and corporate income taxes accounted for only 2.1 percent of state and local revenue in 1927 and 3.5 percent in 1940. Only 7 percent of the growth in revenue centralization in the period 1927–1940 is attributable to them (Wallis 2006, table Ea247275).

³Blanket property tax limits set a cap on the combined millage that all jurisdictions within a state could levy on a single piece of property (Mott and Suiter 1936).

that states with larger income declines experience an increase in the share of combined local and state revenues collected by state governments. Empirically, we find that states with a larger income decline in 1929–1932 centralized revenue and expenditures relatively more between 1932 and 1942. This channel accounts for between one-third and one-half of the observed increase in the states' share of combined state and local revenue and expenditures in this decade. Finally, the model predicts that federal aid produces a different effect on state centralization depending on whether it takes the form of matching or lump-sum grants. The former lead to an increase in states' revenue share (as argued by Wallis 1984 and Wallis and Oates 1998) while the latter have the opposite effect. In our empirical analysis, we instrument federal aid received by a state using Wright's (1974) political variables, summarizing the state's importance for Franklin Delano Roosevelt's reelection in 1936. Using this approach, we find that states that received exogenously more federal aid experienced a relative decline in the revenue share accounted for by state governments.

Our emphasis on the importance of income decline for institutional change is consistent with a number of accounts of the events of the Depression. Teaford (2002) ascribes the process of fiscal centralization by the states to taxpayer discontent toward the property tax and the fiscal crisis faced by local governments. Rueben (1994) finds support for "economic stress" theories of the introduction of sales taxes, according to which the economic downturn of the 1930s induced state governments to seek out new sources of revenue to finance expenditures. Hartley, Sheffrin, and Vasche (1996) attribute the passage of the 1933 Riley-Stewart Amendment—a major fiscal reform in California inclusive of a sales tax—to "growing voter discontent over the property tax during the Great Depression" (666). In a related paper, Gillitzer (2017) argues that states that were most hit by the Great Depression found it optimal to broaden their tax base in order to raise revenue at lower tax rates and reduce the deadweight loss of taxation. Consistent with this view, he also finds that states that experienced larger drops in income during the Great Depression were more likely to adopt a retail sales tax. Finally, our paper is related to the empirical literature on the determinants of fiscal centralization. An incomplete list of papers includes Matsusaka (1995, 2000) and Baicker, Clemens, and Singhal (2012), who focus on the experience of US states; and Panizza (1999) and Arzaghi and Henderson (2005), who study cross-country variation in fiscal centralization.

The rest of the paper is organized as follows. Section I presents a model to illustrate the mechanism linking income decline to tax delinquency and state centralization. In Section II, we test the model's key predictions using state-level data. Section III concludes. The online data Appendix contains details on the data used in the empirical part of the paper.

I. The Model Economy

In this section, we introduce a simple model that links income decline to tax delinquency, federal aid, and fiscal centralization through the introduction of sales taxes. From the model, we derive a number of empirical predictions that are then tested in Section II. In the model, provision of a public good may be financed by a property tax and by an indirect tax. The trade-off between these taxes is based

on two assumptions. The first assumption is that locally raised property taxes are transformed more efficiently into public good provision than indirect taxes raised by the state. This assumption is consistent with the fact that at the eve of the Great Depression local governments accounted for about three-quarters of combined local and state taxes. In practice, local provision might allow for better voter monitoring of how politicians use tax revenue, for more flexibility in the use of funds and for better tailoring of expenditures to local needs. On this point, Husted and Kenny (2000) show empirically that, as the state share of education revenue increases, measures of school efficiency, such as test scores, decline. Besley and Coate (2003) emphasize other costs of centralized provision of public goods, such as political uncertainty and misallocation across localities associated with the formation of coalitions and bargaining in legislatures.

The second assumption concerns the scope for tax delinquency, unlike property taxes, sales taxes cannot be avoided. This feature of indirect taxes induces the policymaker to expand their use, following the sharp income decline and the rise in property tax delinquency at the onset of the Great Depression. The reason why tax delinquency was likely to be less of an issue for indirect rather than property taxes is twofold. First, yearly property tax payments by the owner of property to the local government were large relative to the day-to-day transactions, such as purchasing food, that were subject to sales taxation. Therefore, a cost-benefit analysis would have discouraged sales tax evasion because of the relatively small size of the transactions involved. Second, while property tax payments consisted of direct transfers by the owner of property to the local government, the sales tax was, instead, collected by a retailer who acted as a tax collector on behalf of the state government. Tax delinquency, in this case, would have required the willing participation of buyers and sellers, instead of the unilateral decision of the property owner.

A. Theoretical Framework

The model economy, which is meant to represent a US state, is populated by a representative agent and a benevolent policymaker. The representative agent cares about private consumption c and consumption of a public good g . Public good provision is financed by two distinct sources of revenue. The first one is a head tax t_l , a proxy for the locally controlled property tax (Hamilton 1975, 1976). For our purposes the key aspect of the property tax that is conveniently captured by a head tax is that when an individual's income falls her tax bill does not fall automatically, leading to an increase in tax delinquency. The second source of revenue is a consumption tax with rate t_s , representing the sales tax introduced by many states during the Depression.

Formally, the agent's preferences are represented by the following logarithmic utility function:

$$(1) \quad U = \ln c + \lambda \ln g - \kappa d t_l,$$

where the parameter $\lambda > 0$ indexes the relative weight of the public good. While the agent may choose to be delinquent on a portion d of her property taxes t_l , she

bears a utility cost κ per unit of delinquent taxes. The latter reflects the consequences of social stigma and of the threat of losing the title to one's home on an individual.⁴ The agent spends her income y on consumption and state and local taxes, according to the budget constraint

$$(2) \quad y = (1 + t_s)c + (1 - d)t_l.$$

The policymaker's budget constraint is

$$(3) \quad g = \rho(1 - d)t_l + t_s c(1 + f) + F.$$

The first term on the right-hand side of this equation represents the contribution of property tax collection, $(1 - d)t_l$, to the provision of the public good. A unit of locally raised taxes is transformed into ρ units of the public good, with $\rho > 1 + f$ in order to capture the advantage of local over state provision discussed above. The second term on the right-hand side of equation (3) represents consumption tax revenue $t_s c$ plus any matching-grants $f t_s c$ from the federal government. Last, F represents a lump-sum transfer of revenue from the federal government to state and local governments. We distinguish between matching grants and lump-sum transfers because they have different implications for the mix of state and local tax revenue. Notice that both F and f are parameters outside of the policymaker's control.⁵

The representative agent chooses property tax delinquency d in order to maximize utility (1) subject to the budget constraint (2), taking taxes and government expenditures (t_l, t_s, g) as given.⁶ The policymaker chooses (t_l, t_s, g) in order to maximize utility (1) subject to the government budget constraint (3), taking the agent's delinquency d as given. The assumption that the government takes d as given when choosing taxes is equivalent to postulating that the policymaker chooses policy after or simultaneously with the representative agent. It can be shown that, with this timing of events, equilibrium property and sales taxes may realistically coexist for intermediate levels of income (see the discussion surrounding equation (10)).⁷

⁴See Luttmer and Singhal (2014) for a discussion of non-pecuniary factors, such as social stigma in tax compliance decisions. Notice that the cost of tax delinquency is a utility cost that does not represent revenue for a local government. Property tax delinquency usually involved local governments selling the title to one's house after some time. As explained by Beito (1989, 8), the tax title market effectively ceased to function during the Depression. Hence, an individual's failure to pay the property tax did result in a loss of revenue for local governments.

⁵For simplicity, we abstract from discussing the financing of federal transfers to the states. In practice, the federal government relied heavily on borrowing in order to finance New Deal spending programs (Wallis and Oates 1998).

⁶While we use the representative agent setup to avoid unnecessary analytical complications, we emphasize that the model's delinquency rate should be interpreted as representing the share of homeowners who are fully delinquent on their taxes rather than literally as a decision by all households to only pay some share of their taxes.

⁷The alternative timing assumption in which the government selects taxes first, taking into account the representative agent's response in terms of d , also generates a transition from property to sales taxation as income drops. However, in this case there is no coexistence of these two types of taxes in equilibrium.

B. Politico-Economic Equilibrium

In this section, we solve for the model's equilibrium. Consider first the representative agent's choice. Formally, use the budget constraint (2) to replace c in the utility function and maximize the latter with respect to d . The interior first-order condition of this problem is

$$(4) \quad \frac{1}{y - (1 - d)t_l} = \kappa.$$

Equation (4) states that the marginal benefit of not paying an extra dollar of property taxes must be equal to its marginal cost, κ . Notice that the marginal benefit of property tax delinquency increases as income declines due to the rising marginal utility of consumption.

Consider now the problem of the policymaker. The latter maximizes the agent's utility function with respect to (t_l, t_s) , taking into account the effect of taxes on g through the government budget constraint (3). The interior first-order conditions of this problem can be written as

$$(5) \quad t_l : \frac{\lambda c}{g} [(1 + t_s)\rho - t_s(1 + f)] = 1 + \kappa c \frac{1 + t_s}{1 - d} d,$$

$$(6) \quad t_s : \frac{\lambda c}{g} (1 + f) = 1.$$

These two equations equalize, at the margin, the benefit and cost of increasing property and indirect taxes by an amount such that private consumption falls by one unit. The right-hand side of equation (6) represents the marginal cost, in terms of lost consumption, of higher sales taxes. In addition, the property tax has an additional cost, represented by the second term on the right-hand side of equation (5), associated with the utility loss of property tax delinquency.

The marginal benefit of higher taxes appears on the left-hand side of equations (5) and (6). It is given by the marginal increase in the consumption of g afforded by higher taxes, shown in parentheses, multiplied by the marginal rate of substitution of private and public consumption, $\lambda c/g$. Notice that the impact of a higher property tax on g in equation (5) is increasing in the productive advantage of locally-raised taxes, ρ . Moreover, the impact of a higher consumption tax on g in equation (6) is increasing in the matching subsidy rate f that states receive from the federal government.

The equilibrium of the model described above consists of private and public good consumption, c and g , taxes t_l and t_s , and a delinquency rate d , such that the budget constraints (2) and (3), and the optimality conditions (4), (5), and (6) hold. Solving this system of equations yields the following expressions for property and sales tax revenues:

$$(7) \quad T_l \equiv (1 - d)t_l = y - \kappa^{-1},$$

$$(8) \quad T_s \equiv t_s c = \frac{\lambda(1 + f) + \rho - \kappa(\rho y + F)}{(1 + \lambda)(1 + f)\kappa},$$

while the property tax delinquency rate is

$$(9) \quad d = \frac{(1 + \lambda)(\rho - 1 - f)}{\kappa(\rho y + F) + \lambda(\rho - 1 - f)}.$$

Notice, from equations (7) and (8), that the solution is interior, and property and sales taxes coexist ($T_l > 0$, $T_s > 0$) as long as income is in the range

$$(10) \quad \frac{1}{\kappa} < y < \frac{\rho + \lambda(1 + f)}{\kappa\rho} - \frac{F}{\rho}.$$

Outside of this range, the tax system is fully specialized. In particular, in the relevant case in which income is larger than the upper bound in (10), only property taxes are used.⁸ In this situation, equation (6) holds as an inequality ($t_s = 0$), while the property tax and the delinquency rate are still determined by equations (4) and (5). Solving for property tax delinquency in this case yields

$$(11) \quad d = \frac{(1 + \lambda)\rho - \kappa(\rho y + F)}{\lambda\rho},$$

which declines with income until it eventually becomes zero.

Figure 2 illustrates graphically how the state's share of state and local taxes $T_s/(T_s + T_l)$ and the delinquency rate d vary with income y . The shaded area in the figure indicates the range of y such that property and sales taxes coexist. Notice that, as income exceeds the upper bound in (10), the share of state taxes goes to zero, while the delinquency rate, given by (11), remains positive until it eventually becomes zero as well.

C. Interpreting Institutional Changes during the Depression

We use the model's equilibrium and the visual representation in Figure 2 in order to interpret the institutional changes related to fiscal centralization that occurred during the Great Depression. We interpret the pre-Depression period as corresponding to a level of income exceeding the upper bound in equation (10). In this case, the efficiency advantage associated with locally raised taxes and encoded in the assumption $\rho > 1 + f$ induces the policymaker to rely exclusively on property taxes. As income declines, the marginal utility of consumption increases, and so do incentives for tax delinquency. Eventually, as income falls below the upper bound in equation (10), the rise of property tax delinquency is sufficiently detrimental to property tax collection, T_l , to induce the policymaker to introduce sales taxes. Differently from property taxes, sales taxes cannot be avoided, allowing the policymaker to offset some of the decline in public good provision associated with tax delinquency.

⁸We mention for completeness that when income falls below the lower bound in (10), delinquency becomes pervasive, and the equilibrium features only sales taxes. No state experienced a complete elimination of property taxation during the Great Depression, so we ignore this extreme scenario in our discussion.

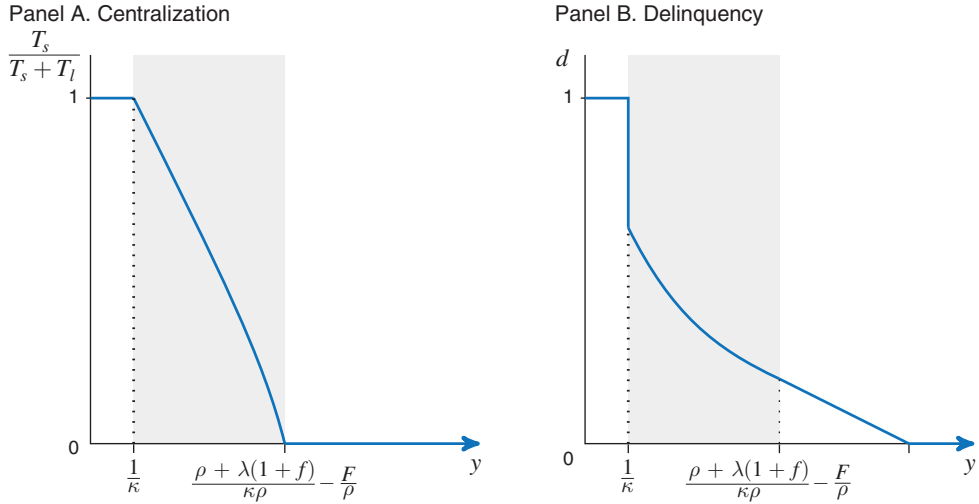


FIGURE 2. EFFECT OF INCOME DECLINE ON CENTRALIZATION AND DELINQUENCY

Note: The shaded areas represent the region in which the two taxes coexist.

Further declines in income within the range in equation (10) exacerbate this trend, leading to an increase in sales tax revenue T_s (see equation (8)). As a result, the share of revenue collected by state governments increases as income declines. This discussion leads to two empirical predictions of the model.

PREDICTION 1: *States characterized by a larger income decline are more likely to introduce sales taxes, (i.e., cross the income cut-off for the introduction of sales taxes in Figure 2).*

PREDICTION 2: *States characterized by a larger income decline are more likely to experience an increase in the share of taxes $T_s/(T_s + T_l)$ collected by states relative to local governments.*

In addition, as argued by Wallis (1984) and Wallis and Oates (1998), during this period, the federal government might have affected revenue centralization through its aid policies. The parameters (f, F) play different roles in the context of our model. The matching rate f has a positive effect on T_s because it increases the marginal benefit of raising sales taxes. The lump-sum transfer F instead tends to substitute for sales taxes and leads to a decline in T_s . The federal aid data we use in our empirical analysis corresponds to

$$(12) \quad \text{total federal aid} = fT_s + F,$$

and so it does not distinguish between matching grants fT_s and lump-sum grants F . For this reason, while the instrumental variables approach we follow exploits exogenous variation in federal aid induced by political and geographic considerations

TABLE 1—SUMMARY STATISTICS

	Mean	SD	Min	Max
<i>Outcome variables</i>				
Blanket tax limit ^a	0.167	0.377	0.000	1.000
Sales tax ^a	0.583	0.498	0.000	1.000
Permanent sales tax ^a	0.479	0.505	0.000	1.000
Temporary sales tax ^a	0.104	0.309	0.000	1.000
Difference state rev. share, 1932–1942 ^b	0.230	0.080	0.084	0.402
Difference state exp. share, 1932–1942 ^b	0.224	0.088	0.078	0.464
Difference log local expenditures, 1932–1942	−0.503	0.211	−0.926	−0.050
<i>Regressors of interest</i>				
Percent growth in per capita income, 1929–1932	−0.364	0.101	−0.595	−0.166
Percent manuf. employment growth, 1929–1932	−0.445	0.120	−0.675	−0.221
log federal aid to state	4.974	0.428	3.995	6.175

^aDummy variable. The unit of observation is a US state. Summary statistics for all variables used in this section may be found in Section A.2 of the online data Appendix.
^bShares are in percentage points/100.

(see Section II for details), the predicted association between exogenous variation in federal aid and fiscal centralization is ambiguous.

PREDICTION 3: *Exogenous increases in the magnitude of federal aid to the states may be either positively or negatively associated with the share of taxes $T_s/(T_s + T_l)$ collected by the states. The former situation emerges if exogenous variation in federal aid is mainly due to differences in the generosity of the matching-grant ratio (f in the model). The latter situation emerges if exogenous variation in federal aid is mainly due to differences in the generosity of lump-sum transfers (F in the model).*

We conclude our discussion of the impact of federal aid on fiscal centralization by pointing out that we don’t necessarily expect the latter variable to display a systematic association with the introduction of sales taxes because about half of the states that introduced sales taxes did so in 1932–1933, while the New Deal policies were ushered in starting in mid-1933. We proceed to test the model’s prediction in the next section of the paper.

II. Empirical Analysis

A. Data and Descriptive Statistics

Throughout our analysis, the basic unit of observation is a US state. The sample includes 48 states because Alaska and Hawaii became states only in 1959. Table 1 provides summary statistics for the outcome variables and the main regressors of interest. We postpone the discussion of additional controls and instruments to Section IIB. The data are described in full in online data Appendix A.

We consider five outcome variables. The first is a dummy variable for the adoption of a general sales tax during the 1930s. Almost 60 percent of the states adopted a sales tax in this period (Jacoby 1938; Rueben 1994). The second policy variable

TABLE 2—STATE BLANKET PROPERTY TAX LIMITATIONS AND SALES TAX ADOPTIONS

Blanket property tax limit		Sales tax adoption
Michigan, Washington, Indiana, West Virginia	1932	Mississippi, Pennsylvania ^a
Ohio, Oklahoma, New Mexico	1933	Arizona, Illinois, Indiana, Utah, Michigan, North Carolina, Oklahoma, California, Washington, New York ^a , South Dakota
	1934	Missouri, Iowa, West Virginia, Kentucky ^a
	1935	Ohio, Colorado, Idaho ^a , Wyoming, Arkansas, North Dakota, Maryland ^a , New Mexico
	1936	Louisiana
	1937	Alabama, Kansas

Notes: *Blanket property tax limitation*: North Dakota instituted a blanket property tax limitation in 1919. *Sales tax adoption*:

^a denotes states that allowed the sales tax to expire or repealed it by 1942.

Sources: *Tax limits*: Mott and Suiter (1936, table 13). *Sales taxes*: Jacoby (1938, table 14) and US Advisory Commission on Intergovernmental Relations (1994, table 14)

is a dummy for the adoption of blanket tax limit during the 1930s. We interpret the latter as an indicator of popular discontent over property taxation. As shown in Table 1, one in six states adopted a blanket property tax limitation during the Depression (Mott and Suiter 1936, table 13; *The New York Times* 1939). The list of states adopting one or both of these policies, together with the adoption date, is contained in Table 2.

Third, we seek to explain the increase in revenue and expenditure centralization—measured by a state’s share of combined state and local revenues and expenditures—between 1932 and 1942. The choice of the years 1932 and 1942 reflects constraints on data availability. The state-level fiscal data—provided by Sylla, Legler, and Wallis (1994)—is drawn from censuses of government finances, which were only conducted in two years during the period of interest. The earliest year of data available before 1932 is 1913 and after 1942 is 1962. Revenue refers to *own* revenues—revenues raised directly by the government and not derived from intergovernmental grants—and expenditures include grants made to another level of government but subtract out total grants received from other levels of government (Wallis and Oates 1998). Notice that the state’s share of own revenues might differ from its share of expenditures to the extent that states and local governments financed a portion of their expenditures by borrowing rather than raising taxes. While in the model of Section I all expenditures are financed by current taxes, in our empirical analysis we consider both measures of state centralization. Based on these definitions, it is important to point out that, while the expression “revenue centralization” refers to the increase in the share of tax revenues collected by the states, the expression “expenditure centralization” encompasses two distinct trends. The first one is the direct funding and administration by the states of governmental functions that, before the Great Depression, were the prerogative of local governments.⁹ The second manifestation of expenditure centralization is the rise in intergovernmental

⁹In 1927, 69 percent of all spending on “public welfare” was undertaken directly (i.e., financed by own revenue) by local governments, against spending shares of 25 percent and 6 percent by the states and the federal

transfers from the states to localities meant to fund programs, such as K–12 education, over which local governments retain control. In 1927, local governments accounted for 69 percent of all direct education spending, against 7 percent of state governments. By 1940 these shares had not changed much; the local share was 66 percent and the state share 11 percent (Wallis 2006, tables Ea180, Ea403, Ea537). The increased role of the states in education funding during the 1930s (see the Introduction) took the form of intergovernmental grants. Notice that even this type of fiscal centralization might have hurt the autonomy of local governments in the long-run as states began attaching mandates to education grants. The fifth and last outcome measure we consider is the logarithm of local expenditures, a level, rather than a share, variable.

There are three main regressors of interest. Following Predictions 1 and 2 derived in Section IC, the main driving force of our model is the income decline experienced by a state between 1929 and 1932. We measure the latter as the logarithmic difference between its personal income per capita in 1932 and in 1929 using the Bureau of Economic Analysis' Regional Data (table SA1). We consider the decline from 1929 to 1932 because the National Bureau of Economic Research dates the peak of the business cycle in the third quarter of 1929 and the trough in the first quarter of 1933. Since we only have yearly income data at the state-level, we consider 1929–1932 to be the contraction phase of the cycle (Garrett and Wheelock 2006). Notice that the policies we focus on—tax limitations and sales tax adoptions—were all enacted during or after 1932. The income variable is converted in real terms by dividing it by the national Consumer Price Index. As a robustness check we employ the growth rate of state-level manufacturing employment (instead of personal income per capita growth between 1929 and 1932). We use manufacturing, rather than aggregate, employment because, it is less subject to the measurement error issues described by Wallis (1989), who constructed the state-level employment indices based on Bureau of Labor Statistics data.

Finally, as discussed in Prediction 3 in Section IC, we are also interested in evaluating the impact that New Deal grants had on fiscal centralization. We measure federal aid as the (logarithm of) the total real aid per capita received by a state from the federal government in the period 1933–1939. To construct this measure of federal aid we use data from the *Annual Report of the Secretary of the Treasury* (1933–1940).¹⁰

B. Sales Tax Adoption and Blanket Property Tax Limitations

We start by evaluating Prediction 1 of our theoretical analysis, concerning the increased likelihood that states hit by larger income declines introduced general sales taxes. In addition, as our model makes clear, the rise in property tax delinquency was costly, not only from the perspective of local governments whose tax

governments, respectively. By 1940, the local share had fallen to 48 percent and the state share risen to 40 percent (Wallis 2006, tables Ea182, Ea408, Ea542).

¹⁰We have also employed a second measure of federal aid reported by Reading (1973), who drew on a different government document with nearly identical results. The correlation between the two variables is 0.93. A more detailed comparison of our aid variable and Reading's one is provided in Section A.2.3 of the online data Appendix.

TABLE 3—SALES TAX ADOPTION: MARGINAL EFFECTS

	Probit (1)	Probit (2)	Probit (3)	Probit (4)	IV Probit (5)	IV Probit (6)
Percent growth in per capita income, 1929–1932	–2.558 (0.439)	–1.709 (0.606)	–2.202 (0.587)		–2.646 (0.611)	–2.201 (0.611)
Percent growth manuf. employment, 1929–1932				–1.377 (0.691)		
log federal aid to state	0.034 (0.149)	0.056 (0.161)	–0.049 (0.213)	0.373 (0.247)	–0.703 (0.304)	–0.047 (0.305)
Observations	48	48	48	48	48	48
Covariates	No	Yes	Yes	Yes	Yes	Yes
Census region dummies	No	No	Yes	Yes	Yes	Yes
<i>Instruments</i>						
Political					Yes	No
Land					No	Yes
F-statistic (first-stage)					34.13	81.29

Notes: *Covariates*: debt restriction, same party control, Republican control, Southern state, log income per capita 1929. *Instruments* for federal aid: electoral votes per capita, standard deviation Democratic vote share, 1896–1932, federal land per capita, nonfederal land per capita. Standard errors are reported in parentheses. The first-stage regressions for the IV Probit specifications in columns 5 and 6 can be found in online data Appendix Table A.5. The *F*-statistic in the last row tests the null hypothesis that the coefficients on the excluded instruments in the first stage are jointly equal to zero. *Variable definitions*: see text and online data Appendix.

base shrank, but also from the perspective of individuals. In a number of states, the introduction of sales taxes was often preceded by state-level voter initiatives that either adopted or strengthened state-wide property tax limitations. In this section, we interpret such *blanket* property tax limitations as strong and direct indicators of voter discontent with the property tax and empirically investigate the link between their adoption and state-level income decline.

We start by running state-level probit regressions for the probability of introducing a sales tax during the 1930s on measured income decline, federal aid, and a number of control variables. Table 3 displays the marginal effects of these probit regressions. In all regression specifications, the income growth variable displays a statistically and economically significant association with the probability of adopting a sales tax. States that experienced larger declines in per capita income in 1929–1932 were more likely to adopt sales taxes. In column 1 of Table 3, the only explanatory variables are the percent growth in income and federal aid. Reducing a state’s income growth by 1 standard deviation, or about 10 percentage points (Table 1), is associated with an increase in the probability of adopting a sales tax of about 26 percentage points.

In column 2 of Table 3, we include as controls the variables proposed by Rueben (1994) in her study of sales tax adoption. These variables include a dummy (debt restriction) for whether the state government was legally prohibited from raising debt; a dummy (same party control) that indicates states where a majority of both houses of the state legislature and the governor were in the same political party; a dummy (Republican control) set equal to one if Republicans controlled both houses of the legislature and the governor’s office; a dummy variable for southern states (Southern state); and the logarithm of 1929 state income per capita. The estimated

effects of these control variables on sales tax adoption are consistent with Rueben's. While the inclusion of these controls lowers the marginal effect of the income growth variable, the latter remains statistically and economically significant. According to the specification in column 2, a 1 standard deviation decrease in income from 1929 to 1932 is associated with an increase in the probability of adopting a sales tax by about 17 percentage points. In column 3 of Table 3, we also include dummies for census regions in the probit regression in order to control for unobserved regional shocks that might be correlated with income decline and with the introduction of sales taxes. Adding region dummies increases the marginal effect of income decline on the likelihood of sales tax adoption relative to the specification in column 2.

In column 4 of Table 3, we use 1929–1932 *manufacturing employment* growth instead of *income* growth as our “economic shock” variable, and obtain quantitatively analogous results. A 1 standard deviation (12 percentage points) decline in manufacturing employment growth increases the probability of adopting a sales tax by about 16 percentage points, a magnitude similar to Rueben's (1994).

The marginal effects of the federal aid variable is statistically insignificant in all probit specifications (1)–(4). The discussion of the model's predictions in Section IC makes it clear that federal aid may be endogenous in the regressions of Table 3, leading to inconsistent estimates. The ideal instrument exploits variation in federal aid received by a state that is uncorrelated with the unobserved determinants of sales tax adoption. Following the literature, we consider two sets of instruments. The first is based on Wright (1974), who argues that federal grants were allocated across states so as to increase Roosevelt's probability of reelection in 1936. Wright shows that the number of electoral votes per capita, and the within-state (time-series) standard deviation of the Democratic vote share in presidential elections from 1896 to 1932 were powerful predictors of New Deal spending in a state.¹¹ The second set of instruments is based on the land area of a state. Reading (1973) hypothesizes that more grants flowed to states with larger amounts of federal land because relief projects on federal land both improved the land and minimized the amount of bureaucratic machinery necessary to get them underway. More recently, Fleck (2008) points out that the amount of nonfederal land in a state was an important determinant of the amount of federal highway grants received by a state. We therefore consider both federal and nonfederal land per capita as instruments for federal aid. Columns 5–6 of Table 3 present instrumental variable probit (IV probit) regressions for the probability of sales tax adoption. The estimated impact of the income growth variable remains negative and quantitatively similar to the one reported in columns 1–3. The impact of federal aid on sales tax adoption instead becomes negative and statistically significant when using Wright's political instruments (column 5). It is also

¹¹ The premise of Wright's (1974) argument is that the Roosevelt administration sought to distribute discretionary aid dollars among states so as to maximize electoral votes while minimizing costs. Assuming that a given amount of federal aid could buy a vote and that the distribution of this cost is equal across states, states with more electoral votes per capita could be “bought” relatively more cheaply since each voter has more influence over which candidate the state's electoral votes goes. States in which the standard deviation of the Democratic vote share was low were either solidly Democratic or Republican; an aid dollar spent there would do little to change the outcome of the election. High standard deviation states, however, could potentially be swung into the Democratic camp with more aid dollars. Notice that we would obtain similar results using Wright's “political productivity index” (which is itself based on the electoral votes measure) as an instrument, rather than the electoral votes variable.

TABLE 4—PROPERTY TAX LIMITATION ADOPTION: MARGINAL EFFECTS (*Probit*)

	(1)	(2)	(3)
Percent growth in per capita income, 1929–1932	–1.471 (0.522)	–1.356 (0.439)	–1.301 (0.601)
Observations	48	48	48
Covariates	No	Yes	No
Census region dummies	No	No	Yes

Notes: *Covariates*: percent renters in 1930, percent 10–19 years old enrolled in school in 1927–1928, percent urban in 1930, log income in 1929, percent democratic vote in 1929, percent nonwhite in 1930, state initiative dummy. Standard errors are reported in parentheses. *Variable definitions*: see text and online data Appendix.

negative when using Fleck’s land instruments, although in this case the effect is not statistically different from zero. Thus, there is some evidence that higher exogenous levels of federal aid reduced the probability of sales tax adoption by the states.

We conclude this section by considering the effect of income decline on the likelihood of passage of referenda imposing blanket property tax limitations on the combined millage that could be levied on a single piece of property. Specifically, we run state-level probit regressions for the probability of passing tax limitations during the 1930s on measured income decline from 1929 to 1932 and a number of control variables.¹² Table 4 reports marginal effects of these regressions. In all the specifications we consider, the growth in per capita income from 1929 to 1932 is significantly and negatively correlated with the probability of adopting a blanket tax limitation. According to the estimate in column 1, a 1 (cross-state) standard deviation decrease in 1929 to 1932 income growth—corresponding to about 10 percentage points—increases the probability that a blanket tax limitation will be adopted by 14.7 percentage points. The estimated marginal effect is robust to the inclusion of a number of control variables (column 2 of Table 4) that account for voters’ preferences over public good spending and tax limitations (e.g., Vigdor 2004) and to the inclusion of dummies for the four census regions (column 3 of Table 4). Overall, the results of Table 4 are consistent with the hypothesis that the income decline at the onset of the Great Depression led to increased discontent with the property tax.

C. Fiscal Centralization

In this section, we investigate empirically Predictions 2 and 3 discussed in Section IC. Specifically, we consider two *direct* indicators of state fiscal centralization—the state government’s share of combined state and local revenue and expenditure—and assess their association with the decline in state per capita income at the onset of the Depression and with federal aid. State-level fiscal data

¹²We exclude from the latter the federal aid variable because blanket tax limitations were passed relatively early in the Depression, in 1932 and 1933, so it is highly unlikely that they are explained by New Deal policies enacted in 1933 and implemented over a number of subsequent years. Including federal aid in the regressions does not affect our results and the aid variable is not statistically significant.

TABLE 5—FISCAL CENTRALIZATION (OLS)

	State share of:						log local	
	Rev. (1)	Exp. (2)	Rev. (3)	Exp. (4)	Rev. (5)	Exp. (6)	Rev. (7)	Exp. (8)
Percent growth in per capita income, 1929–1932 × 1942	−0.214 (0.080)	−0.226 (0.109)	−0.231 (0.093)	−0.300 (0.128)			0.662 (0.209)	0.933 (0.269)
Percent growth in manuf. employment, 1929–1932 × 1942					−0.369 (0.081)	−0.324 (0.102)		
log federal aid to state × 1942	−0.063 (0.023)	−0.046 (0.024)	−0.139 (0.032)	−0.149 (0.035)	−0.047 (0.020)	−0.029 (0.022)	0.077 (0.053)	0.117 (0.063)
Observations	96	96	96	96	96	96	96	96
R ²	0.937	0.925	0.947	0.939	0.954	0.935	0.996	0.994
Census region dummies × 1942	No	No	Yes	Yes	No	No	No	No

Notes: OLS regressions. Robust standard errors are reported in parentheses. State and time fixed effects included in all regressions. Variable definitions: see text and online data Appendix.

are available in 1932 and 1942, allowing us to estimate a difference-in-difference regression of the following form:

(13)
$$z_{st} = \delta_s + d_{1942} \cdot (\alpha_0 + \alpha_1 \cdot \Delta y_s + \alpha_2 \cdot aid_s) + \varepsilon_{st},$$

where z_{st} is the share of revenue or expenditures in state s at time $t = 1932, 1942$; δ_s is a state fixed effect; and d_{1942} is a dummy for $t = 1942$. The parameters of interest are α_1 and α_2 , which correspond to the effect of 1929–1932 income (or employment) growth—denoted by Δy_s —and federal aid—denoted by aid_s —on the change in the dependent variable between 1932 and 1942.

Columns 1 and 2 of Table 5 present ordinary least squares (OLS) estimates of α_1 and α_2 for our revenue and expenditures centralization measures, respectively. The estimates of α_1 reveal that states that experienced a larger decline in per capita income at the onset of the Great Depression centralized revenues and expenditures relatively more between 1932 and 1942. The estimated effects are statistically significant at conventional levels. A 1 standard deviation decrease in 1929–1932 income growth is associated with an additional increase in centralization of about 2.2 percentage points for revenues and 2.3 percentage points for expenditures. Applying these effects to the average income decline experienced in the 1929–1932 period of the Great Depression (see Table 1), we estimate that the latter accounts for 34 percent of the observed increase in revenue centralization and 37 percent of the observed increase in expenditures centralization. These results are supportive of our empirical Prediction 2.

The estimates of the parameter α_2 —the effect of federal aid on centralization—in columns 1–2 of Table 5, instead, reveal a negative partial correlation between federal aid and the increase in states’ revenue and expenditure shares. In other words, states that received more generous federal aid experienced relatively less centralization. This finding can be rationalized if increases in federal aid were mostly associated with lump-sum transfers of revenue from the federal government to the states, as proposed in our empirical Prediction 3.

The rest of Table 5 considers a number of robustness checks and extensions of the main results of columns 1–2. In columns 3–4, we augment the OLS regressions with census region dummies interacted with a time dummy for the year 1942. These additional regressors allow us to control for any region-specific shock to revenue or expenditure centralization that is correlated with state-level income growth. The results are qualitatively similar to those in columns 1–2. In columns 5–6 of Table 5, we correlate the changes in states' shares of revenue and expenditures with a measure of employment, rather than income, growth in 1929–1932. We find that states that experienced larger declines in manufacturing employment in 1929–1932 experienced larger increases in fiscal centralization. Last, we also consider a version of the regression specifications in equation (13) where the dependent variable is the (log) of local revenues and expenditures, instead of the states' shares of combined state and local revenues and expenditures. While the latter are our preferred measures of fiscal centralization, our theory also predicts that the sharp income decline at the onset of the Depression impaired local governments' ability to raise revenue and fund expenditures autonomously from the states. The estimates in columns 7–8 of Table 5 suggest that states with larger income declines at the onset of the Great Depression experienced a smaller growth in the levels of local revenue and expenditures in the following decade, 1932–1942.

Instrumental Variables Estimates.—As discussed in Section IC, variation in federal aid reflects both lump-sum and matching-grant transfers of revenue from the federal government to the states. The latter are likely to induce an endogeneity issue in the OLS regression for centralization (equation (13)) because any independent increase in state revenue would have led to higher transfers to the states through the matching grants mechanism. This channel would, therefore, induce a spurious positive correlation between federal aid and the state's revenue and expenditures share. In addition, state governments that were particularly hard hit by the Great Depression—in ways not fully reflected in the 1929–1932 income decline variable—might have received more aid from the federal government, biasing the OLS estimate of federal aid downward instead. For both reasons, the OLS estimates of the effect of income decline and federal aid on our centralization measures might be inconsistent.

In order to address these concerns, in Table 6, we report the two-stage least squares (2SLS) estimates of the parameters α_1 and α_2 using Wright's (1974) political instruments and Fleck's (2008) land instruments to generate seemingly exogenous variation in federal aid across states. The first-stage estimates reveal that both sets of instruments have the expected sign and are highly statistically significant in accounting for variation in federal aid across states.

The 2SLS estimates are qualitatively and quantitatively consistent with the OLS findings discussed in the previous section. Comparing Table 6 with Table 5, it may be noticed that the estimated effect of 1929–1932 income decline on centralization is a bit larger, in absolute value, in the 2SLS regressions than in the OLS ones. Using the former, the income decline channel now accounts for 38 percent of revenue centralization and 40 percent of expenditure centralization. The effect of federal aid on centralization remains negative and statistically significant.

TABLE 6—FISCAL CENTRALIZATION (IV)

	State share of:			
	Rev. (1)	Rev. (2)	Exp. (3)	Exp. (4)
Percent growth in per capita income, 1929–1932 × 1942	−0.239 (0.057)	−0.238 (0.058)	−0.244 (0.074)	−0.257 (0.074)
log federal aid to state × 1942	−0.084 (0.016)	−0.084 (0.019)	−0.061 (0.019)	−0.072 (0.019)
First-stage coefficients				
Electoral votes per capita × 1942	42.646 (8.219)		42.646 (8.219)	
SD Dem. vote, 1896–1932 × 1942	0.054 (0.008)		0.054 (0.008)	
Federal land per capita × 1942		0.531 (0.207)		0.531 (0.207)
Nonfederal land per capita × 1942		5.114 (0.939)		5.114 (0.939)
Observations	96	96	96	96
F-statistic (first-stage)	52.54	163.01	52.54	163.01

Notes: Robust standard errors are reported in parentheses. All columns include state and time fixed effects. The *F*-statistic in the last row tests the null hypothesis that the coefficients on the excluded instruments in the first stage are jointly equal to zero. *Variable definitions*: see text and online data Appendix.

Relationship with Wallis (1984).—Taken together, neither the OLS nor the IV results are supportive of the view that the policies of the federal government played a role in fostering the rise of state governments during the Great Depression. How does this finding relate to Wallis (1984) and Wallis and Oates (1998) view to the contrary? Wallis’s (1984) regression that is most comparable to ours pertains the link between federal transfers and local expenditures financed through own revenue.¹³ In the latter, Wallis (1984, 157) relates the 1932–1942 change in aggregate local expenditures in a state to the change in intergovernmental transfers received by local governments in that state. Wallis instruments the 1932–1942 change in intergovernmental transfers using Wright’s (1974) political productivity measure and the standard deviation of the Democratic vote share. The underlying logic here is that politically motivated (and therefore plausibly exogenous) transfers from the federal government to the states induced the latter to increase aid to local governments. He finds that local spending declined in relative terms between 1932 and

¹³ Wallis and Oates (1998) is a descriptive paper, so we focus on the evidence in Wallis (1984). In another set of regressions Wallis (1984, table 3, 154) links the *level* of state expenditures in a given year to the *level* of federal aid received by that state in that year, for the years 1937–1940. The federal aid variables are instrumented using Wright’s political productivity measure and the standard deviation of the Democratic vote share. Since these instruments change only across states, and not over time, the only variation that identifies the effect of federal aid on state spending is cross-sectional (i.e., Wallis is not using a difference-in-difference estimator). While in our analysis we have also used multiple observations for the same state (for 1932 and 1942), we are interested in the effect of federal aid on the *change* in, rather than the level of, the state’s expenditure shares. It follows that Wallis’ first set of results cannot be compared directly with ours.

TABLE 7—EFFECT OF TRANSFERS ON LOCAL EXPENDITURES (IV)

	(1)	(2)
log transfers to local \times 1942	−0.287 (0.064)	−0.215 (0.059)
Percent growth in per capita income, 1929–1932 \times 1942		0.731 (0.168)
	First-stage coefficients	
Electoral votes per capita	−65.225 (14.949)	−68.307 (16.827)
SD Democratic vote, 1896–1932	0.018 (0.021)	0.022 (0.022)
Observations	96	96
F-statistic (first stage)	9.57	8.40

Notes: Regressions include state and time fixed effects. Instrumented variable is log transfers to local \times 1942. Robust standard errors are reported in parentheses. The *F*-statistic in the last row tests the null hypothesis that the coefficients on the excluded instruments in the first stage are jointly equal to zero.

1942 in states characterized by larger exogenous transfers from state to local governments. This result appears consistent with Wallis’ view. In order to better understand this result, we replicated it, at least qualitatively, by running a version of his regression. The version we considered relates the change in local spending to the change in intergovernmental transfers per capita received by local governments in a state, using the state’s electoral votes per capita and the standard deviation of the Democratic vote share as instruments for the variation in intergovernmental transfers. The top panel of Table 7 contains our estimates.

The table shows that an exogenous increase in intergovernmental transfers to local governments is associated with a decline in local government’s expenditures. The estimated elasticity of local expenditures to intergovernmental transfers to local governments is in the range of negative 0.2–0.3 and is highly statistically significant. This result is, at least qualitatively, consistent with Wallis’ second-stage regression (1984, 157).

In interpreting the evidence for Wallis’ hypothesis, however, it is necessary to consider the first-stage regression alongside the second-stage one. The first-stage estimates in Table 7 reveal that states with *more* electoral votes per capita—and, therefore, more generous politically motivated federal aid—experienced a *smaller* increase in intergovernmental transfers over the decade 1932–1942.¹⁴ Therefore, although the second-stage relationship between intergovernmental transfers and local expenditures is consistent with Wallis’ hypothesis (i.e., larger exogenous transfers from the states to local governments reduces local governments’ own-financed expenditures), the first-stage one is not consistent with the view that federal policies led to a diminished size of local governments during the 1930s. This evidence is instead consistent with the argument that more generous federal aid in the form of

¹⁴Notice that this first-stage relationship is statistically significant with a *t*-statistic above 4.

lump-sum transfers to the states released the latter from the need to expand state revenue collection in order to aid local governments. In these states, local governments experienced a larger increase (or a smaller decline) in own-financed expenditures between 1932 and 1942 than in states that received less federal aid.

D. Expiration of Sales Taxes and Centralization

During the 1930s, 28 states adopted a sales tax. Of these, 23 states kept the sales tax beyond 1942 (the end of our sample period), while the five states marked by ‘a’ in Table 2 let the tax expire or repealed it by the end of the decade. In our empirical analysis thus far we have not distinguished between these two groups of states, which we label for convenience “permanent” and “temporary” adopters. The historical experience of temporary adopters allows us to refine empirical Predictions 1–2 and further test some of the model’s implications. We focus on two. First, the logic of the model suggests that temporary adopters might have experienced a smaller income decline at the onset of the Great Depression than permanent adopters (a refined version of Prediction 1). In fact, the 1929–1932 income decline in temporary adopters states was only 0.02 log points larger than (and not statistically different from) the corresponding decline in states that never adopted a sales tax. By contrast, average income decline was 0.11 log points larger in permanent adopters states than in temporary adopters ones; moreover, this difference is statistically significant.

Second, if the adoption of a sales tax is the mechanism through which states centralized revenues and expenditures, a temporary adopter state should have experienced a smaller increase in centralization between 1932 and 1942 (a refined version of Prediction 2). To test this prediction we regress our measures of centralization on dummies for sales tax adoption, distinguishing between temporary and permanent adopters. The results are reported in Table 8. First, columns 1 and 3 show that, as a group (i.e., pooling together temporary and permanent adopters), states that adopted a sales tax during the Great Depression experienced a relative increase in measures of centralization by about 9 percentage points between 1932 and 1942. Columns 2 and 4 report analogous results for the case in which we distinguish between temporary and permanent adopters. The permanent introduction of a sales tax is associated with an additional increase in centralization measures by about 10 percentage points relative to states that did not adopt a sales tax. By contrast, a temporary adoption of a sales tax increases centralization measures by 3–5 percentage points only. Moreover, we can strongly reject the null hypothesis that the impact of sales tax adoption on centralization is the same for temporary and permanent adopters when centralization is measured as a revenue share. We conclude that the experience of states that let their sales tax expire is consistent with our main hypothesis.

III. Conclusion

In this paper, we have analyzed one of the most striking changes in intergovernmental fiscal relationships in US history. During the Great Depression the states’

TABLE 8—CENTRALIZATION MEASURES AND SALES TAX ADOPTION (OLS)

	State share of:					
	Rev. (1)	Rev. (2)	Rev. (3)	Exp. (4)	Exp. (5)	Exp. (6)
Sales tax × 1942	0.087 (0.017)			0.089 (0.020)		
Sales tax permanent × 1942		0.101 (0.018)	0.097 (0.020)		0.099 (0.022)	0.095 (0.023)
Sales tax temporary × 1942		0.029 (0.021)	0.028 (0.022)		0.045 (0.026)	0.047 (0.026)
log federal aid × 1942	−0.067 (0.024)	−0.074 (0.024)	−0.118 (0.030)	−0.050 (0.023)	−0.054 (0.023)	−0.122 (0.034)
Observations	96	96	96	96	96	96
R ²	0.953	0.958	0.962	0.940	0.943	0.950
Census region dummies × 1942	No	No	Yes	No	No	Yes
p-value of test: Permanent = Temporary		0.00	0.01		0.07	0.12

Notes: Robust standard errors are reported in parentheses. All columns include state and time fixed effects. Variable definitions: see text and online data Appendix.

share of combined state and local revenue and expenditures increased greatly. Our main hypothesis is that this shift was brought about by the severe contraction of the early years of the Depression. We have used a model to illustrate a mechanism through which income decline leads to increased support for sales taxation and fiscal centralization. Finally, we have shown empirically that states that experienced larger declines in income in 1929–1932 were more likely to pass blanket limitations on property taxation, introduce a general retail sales tax, and, more generally, to centralize revenue and expenditures in the hands of state governments during the 1930s.

It is interesting to note that while the income shock of the Great Depression was only *temporary*—although very severe—it led to a seemingly *permanent* change in state and local government relations. Sales taxation and state centralization have in fact persisted for many decades after the end of the Great Depression. This point applies more generally to many New Deal policies of the 1930s, such as social security, the minimum wage, unemployment insurance, and collective bargaining, among others. While a complete account of this “hysteresis” is outside the scope of the paper, one hypothesis is that the severity of the Depression enabled the type of institutional reform that requires a very broad political consensus. After the economic crisis passed, support for centralization might have declined, but the politico-economic coalition favoring a return to the pre-Depression status-quo was not sufficiently large. We leave further exploration of this important question to future research.

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