THE EFFECTS OF FLUCTUATIONS IN FEDERAL REVENUE SHARING PAYMENTS MADE TO RURAL COUNTIES ON SCHOOL DISTRICT BUDGETS

by

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A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Economics

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UTAH STATE UNIVERSITY
Logan, Utah

2019

ABSTRACT

The effects of federal revenue sharing payments made

to rural counties on school district budgets

by

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Utah State University, 2019

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Federal revenue sharing payments in place to help counties counteract the potential burden of public lands within the county may or may not have their intended effect. Uncertainty in these payments might cause variation in county income, which would make budgeting difficult for programs that rely on those funds. My intent in conducting this analysis is to determine if the U.S. Forest Service payments have a discernible impact on school district budgets. I use a novel data set and an instrumental variable approach to examine the effect of county payments from the U.S. Forest Service on local school district budgets. Variation from the implementation of and changes to the Secure Rural Schools Act allows me to identify the causal impact of county payments on education budgets.

Some sources suggest that school districts receive roughly one third of the total payments a county receives, which might imply that school districts would increase their total spending by a third of the total USFS payment (Gebert, Calkin, & Schuster, 2004). But I theorize that states will take into account the amount of funding a county receives

from the program and adjust other funding accordingly, either increasing or decreasing funding based on the level of USFS funding. In this case, payments would increase school district budgets by less than one third. My results suggest that the payments don't impact school district budgets.

(36 pages)

PUBLIC ABSTRACT

The effects of federal revenue sharing payments made

to rural counties on school district budgets

Camille Harmer

Federal revenue sharing programs aim to make up lost tax revenue to counties that contain federal land, as counties do not receive any property tax revenue from publicly owned lands. This may have a significant impact on rural school districts with a limited tax base, as most funding for public education comes from property tax revenue. My analysis seeks to determine the full impact of certain federal revenue sharing payments (paid out by the U.S. Forest Service) on school districts in counties that contain U.S. Forest Service land. My analysis shows that the payments have little impact on school district budgets, indicating that states likely smooth for variations in the U.S. Forest Service payments.

ACKNOWLEDGMENTS

I would like to thank members of the U.S. Forest Service that were invaluable in helping me collect the data for this project, particularly David Bergendorf. I would especially like to thank Dr. Briggs Depew for his constant support, advice, and prodding throughout the course of this project, Dr. Chris Fawson for his support and invaluable feedback during my defense, and Dr. Paul Jakus for his extensive edits and feedback.

I give particular thanks to my support group, including family, friends, classmates, and colleagues, and most notably my husband, Arthur, for their unwavering support. I would not have gotten here without them all.

Camille Harmer

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I. Introduction

Most rural counties in the United States contain federal land and do not receive tax revenue from that land, like they do from privately owned land. Several programs attempt to address this income disparity, including the Bankhead-Jones/National Grasslands Payments, Payments in Lieu of Taxes, and Taylor Grazing District Payments. Among these is the "25% fund," established by 16 U.S.C. 500 to compensate rural counties for their loss of property tax revenue from U.S. Forest Service's (USFS) land holdings. The fund is made up of 25% of the revenues from USFS land and is paid out to counties based upon the acreage of USFS land in their jurisdiction. These payments are specifically earmarked for spending on public education and public roads.

Prior to 2000, the calculated revenue varied based on the price of timber on the property and the volume of timber that the USFS harvested, and as such, was highly volatile. The Secure Rural Schools and Community Self-Determination Act of 2000 (Public Law 106–393) was passed in an attempt to stabilize payments to counties by replacing the 25% fund payments with a system tied less closely to timber receipts. The Secure Rural Schools Act is typically only authorized for a few years at a time, and reauthorization is uncertain. In years when the Secure Rural Schools Act is not reauthorized, the USFS reverts back to the original 25% fund payments, although these payments were stabilized by the original SRS. In years where SRS is not reauthorized, 25% payments are based on a seven-year rolling average of past payments.

Uncertainty in these payments might cause variation in county income, which would make budgeting difficult for programs that rely on those funds. My intent in conducting this analysis is to determine if the USFS payments have a discernible impact on school district budgets. I use a novel data set and econometric modeling to examine

the effect of county payments from the U.S. Forest Service on local school district budgets. Variation from the implementation of and changes to the Secure Rural Schools Act allows me to identify the causal impact of county payments on education budgets.

Some sources suggest that school districts receive roughly one third of the total payments a county receives, which might imply that school districts would increase their total spending by a third of the total USFS payment (Gebert, Calkin, & Schuster, 2004). But I theorize that states will take into account the amount of funding a county receives from the program and adjust other funding accordingly, either increasing or decreasing funding based on the level of USFS funding. In this case, payments would increase school district budgets by less than one third. My results suggest that the payments don't impact school district budgets at all.

The paper is broken into six sections: Section II will be a brief history of the programs, Section III will motivate the analysis, Section IV will explain the data, Section V will cover methods, Section VI will discuss the results, and Section VII will conclude.

II. History

The 25% fund was established in the early 20th century when the federal government was beginning to expand control and regulation of public lands. Rural counties that contain public lands are expected to provide the same services as more urban counties, but with less of a tax base than most counties (Congressional Research Service, 2017). On May 23, 1908, Congress passed 16 U.S.C. 500 (more commonly known as the 25% Fund Act) to make up lost revenue to rural counties.

The Act required that the USFS make payments to counties containing USFS land based on timber revenues from the previous year. States receive 25% of timber revenues

from USFS land in the state and distribute the money to counties on based how much of the state's total USFS land is in the county. Those 25% payments are earmarked specifically for public education and roads.

In the 1990s, the USFS began harvesting fewer trees and the price of timber fell, decreasing the amount counties received from the 25% fund. The decrease in the volume of timber sold by the USFS is visualized in Figure 1. The range of the data I use is visualized by red lines at 1995 and 2013.

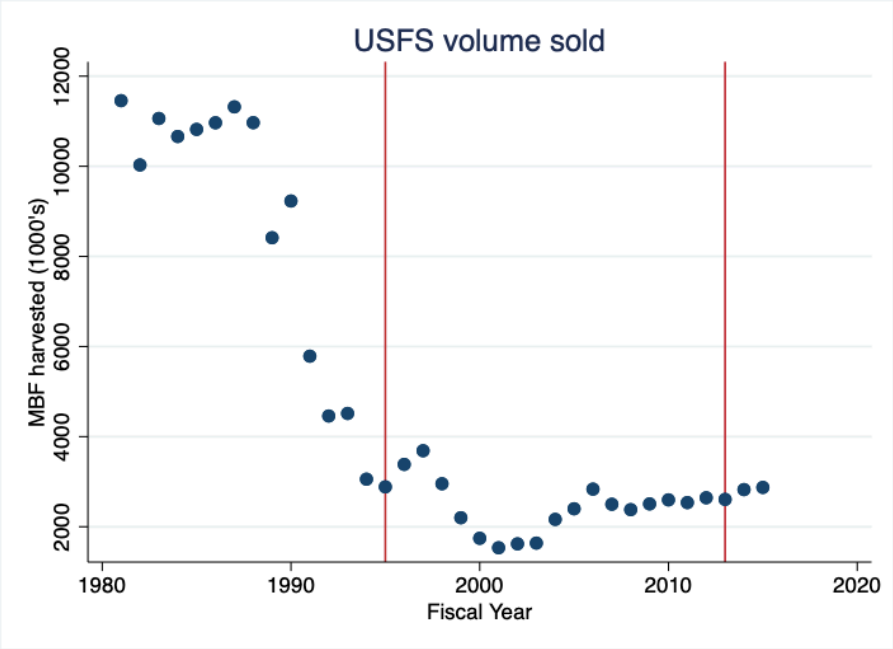

Figure 1

However, Figure 1 only shows part of the picture. In addition to declining timber harvests, the price of timber fluctuated. The variation in the price of timber from 1980-2015 is visualized in Figure 2.

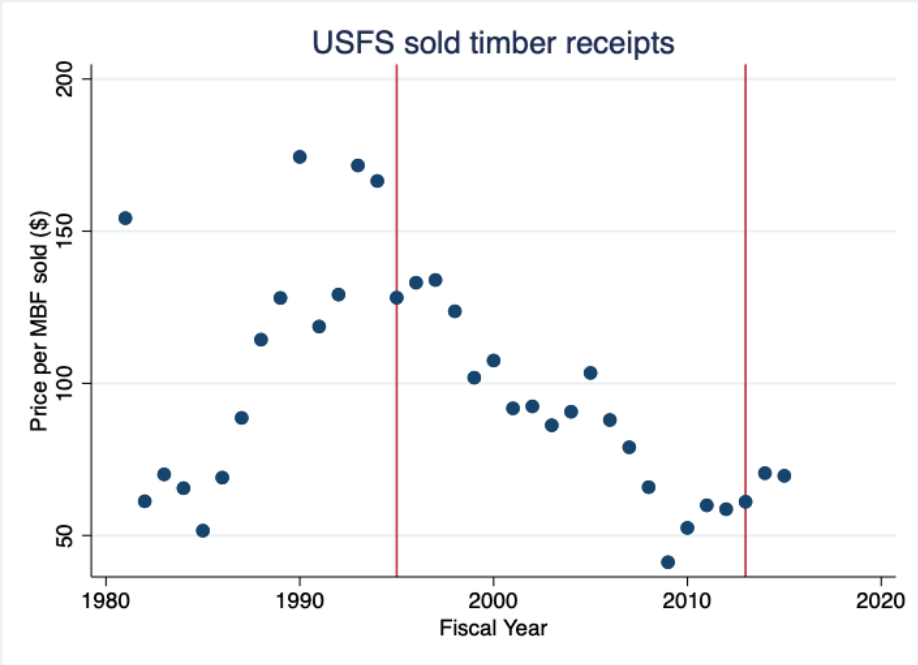

Figure 2

In response to this decline, Congress passed the Secure Rural Schools and Community Self-Determination Act of 2000 (Public Law 106–393). The Act offered a replacement to the 25% payments where payments were not directly connected to USFS timber receipts, so they were more predictable than the 25% payments.

Payments from the original Secure Rural Schools Act (SRS) were only authorized for fiscal years 2001-2006. The Act was reauthorized in 2007, from 2008-2011, in 2012, in 2013, then again from 2014-2015 (Congressional Research Service, 2017). Congress has typically passed reauthorizations right before the Act expires or some time shortly after the expiration. Advocates of the program state that uncertainty in these payments has placed hardship on counties. In years where SRS was not reauthorized, or back payments were later authorized, counties receive the 25% payment for the year. Speaking about the hardship in a year where SRS was not originally reauthorized, Gordon Cruickshank, a county commissioner of Valley County, Idaho said, “In 2015, Valley

County received $1.8 million from the U.S. Forest Service under SRS. This year, we are due for $114,662 in 1908 Act payments, a mere 6% of what we received in FY2015. Statewide, Idaho is taking a 90.6% cut." (Federal payments to local governments provided through the Secure Rural Schools and Community Self-Determination Act and the Payment in Lieu of Taxes Programs and the need to provide greater fiscal certainty for resource-dependent communities with tax-exempt federal land, 2017).

The SRS payments are more complicated than the 25% payments. The total 25% payment a county receives must be used for public education or transportation. With SRS payments, if a county receives over $100,000, they must spend 15-20% of the payment on what are known as Title II or Title III projects. Title II funds must be used to enhance USFS land in the county. These projects must be recommended by a resource advisory committee, groups created by the original Secure Rural Schools Act to help counties manage Title II funds. Until 2008, Title III funds could be used for search and rescue, community service work camps, easement purchases, forest related educational opportunities, fire prevention, and community forestry. When Congress reauthorized the payments in 2008, they required that Title III funds be used only to fund the Firewise Communities program, reimburse county emergency services for their work in national forests, and prepare a community wildfire protection plan.

Table 1 provides average summary statistics for counties that receive, on average, less than or greater than $100,000 (nominal).

Table 1: Statistics about average payments to counties in nominal dollars

	(≤$100,000)	(>$100,000)
Mean	$42,059.1	$1,041,200.00
High	$99,673.52	$24,633,130.00
Low	$3.86	$100,184.8
Standard deviation	$30,557.06	$2,225,924.00
N	196	291

Up until 2008, SRS payments were based on the average of the three highest 25% payments made to counties from 1986-1999 and were adjusted annually based on the Bureau of Labor Statistics' consumer price index for rural areas. The reauthorization in 2008 changed the payments so that counties received their share (based on the percentage of a state's USFS land in the county) from a $500 million dollar "pie." The 2008 reauthorization also decreased the size of the pie by 10% each year. For clarity, in 2008, SRS payments totaled $500 million. In 2009, they totaled $450 million, 90% of the previous year's total. In 2010, payments totaled $405 million, 90% of $450 million.

The 2008 reauthorization significantly complicated how the payments are calculated. A county's "adjusted share" payments come from the total "full funding amount" (based on the "pie" mentioned above). Payments are made based on a formula that considers a county's "base share" (which is a function of the amount of USFS land in the county and the average of the three highest payments made to the county from 1986-1999), the county's per capita personal income, and the median per capita personal income of all eligible counties. The amount of USFS land in a county varies widely. As such, the amount of USFS land in a county is crucial to the calculation. For illustration,

Catoosa County, Georgia contains only 6 acres of USFS land, the smallest amount of all counties that contain USFS land. Wheatland County, Montana contains 16,932,992 acres, the largest amount. Among the 487 counties with land administered by the USFS, the mean acreage is 310,546.8 with a standard deviation of 883,975.7 acres.

The declining payment amount was adjusted in 2012 when it was reauthorized so that payments were 95% of 2011's total payments (2012 payments totaling $344 million). The Act was reauthorized again in 2013 and 2014 for 95% of the previous year's total (Congressional Research Service, 2017). There were no major policy changes with those reauthorizations. Major policy changes are visualized in Figure 3 by red lines at 2001 and 2008.

Counties receive other federal payments, including Payments in Lieu of Taxes (administered by the DOI), and payments made under the Bankhead-Jones Farm Tenant Act. Payments in Lieu of Taxes (PILT) are paid to counties for Bureau of Land Management, National Park Service, and Fish and Wildlife Service lands. Like the SRS payments, they are intended to help counties fund emergency services, public education and transportation, and wildfire management. Under the Bankhead-Jones Farm Tenant Act, the USFS is required to make 25% payments to counties based on receipts from mineral licenses and grazing rights.

III. Motivation

My main interest in conducting this analysis is to determine if the USFS payments have any discernible impacts on school district budgets, as advocates of the program suggest they do (Federal payments to local governments provided through the Secure Rural Schools and Community Self-Determination Act and the Payment in Lieu of Taxes

Programs and the need to provide greater fiscal certainty for resource-dependent communities with tax-exempt federal land, 2017). However, Gebert et al. (2004) suggest, "the majority of the money goes to states where the payments offset the state aid already received by the schools; therefore, these payments have no net effect on the school budgets, leaving rural schools in these areas no more secure than before the act was passed." They analyze the payments using phone interviews with state officials and school administrators.

As Gebert et al. (2004) state, their "process provided anecdotal evidence of how school funding has been affected by the level and variability of revenue-sharing payments from federal lands and helped validate research findings related to the distribution of these payments." Their analysis is limited to anecdotal evidence—evidence that's been invaluable in my analysis, but is incomplete.

My analysis builds on their work by using an econometric analysis with a novel data set to answer the question—does the Secure Rural Schools Act make rural schools secure? Rural schools face great insecurity in their budgeting, mainly due to their limited tax base. This is particularly concerning as most funding for public schools comes from local taxes (Biddle & Berliner, 2002). As such, payments like the 25% and SRS payments could potentially be crucial in supporting local education in rural areas. Determining the actual value of the program is crucial to the most efficient allocation of relatively scarce state and federal funding.

My analysis also builds on the broader literature on the effects of state and federal payments to counties, and how those payments are received. It is broadly interesting to understand how federal payments might impact rural areas.

IV. Data

25% fund and SRS data

The USFS provides a record of 25% fund payments made from 1986-1999 to individual counties, organized by state and county. These data were hand collected from scanned pdfs found online (U.S. Forest Service, 2007). The USFS also provides records of SRS payments and 25% fund payments made to counties from 2001-2017 (as of April 2019) (U.S. Forest Service, 2019). The documents available from 2001-2017 provide breakdowns of Title I, II, and III spending, but I use the totals provided to have a like measure to previous years of data. I was unable to locate records for the 2000 25% fund payments. There is missing USFS data for 2015 for several of the counties in my sample, and, as such, I drop 2015 from the sample.

Figure 3 displays fluctuations in the USFS payments caused by declining timber prices and volume and different policy regimes. Major policy changes are denoted by the red lines at 2001 and 2008.

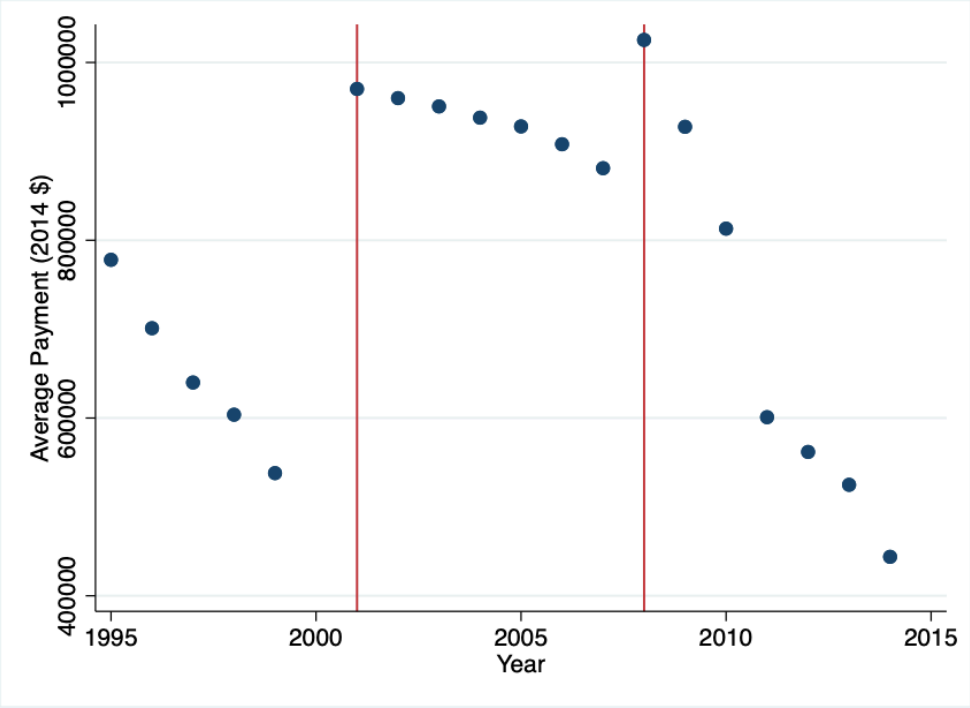

Figure 3

The average payment made to counties from 1995-2013 was $767,193.97 ($2013), the low payment was $0.00 ($2013), and the high payment was $42,094,685.16 ($2013), with a standard deviation of $2,336,967.99 ($2013). The county with the consistently highest payments is Lane County, Oregon, which contains 20% of Oregon's total USFS land. Oregon as a whole contains 10% of the total USFS land in the United States, a considerable amount.

Payments are made to counties the fiscal year following the year of the payment, i.e. payments from 2014 are received by the county in 2015 (Congressional Research Service, 2017). I lead the school district income data accordingly.

School district budget data

I use the Local Education Agency (School District) Finance Survey (F-33) Data provided by the Common Core of Data for America's Public Schools to examine changes

in school district budgets (Common Core of Data for America's Public Schools, 2015). The dataset details school district budgets in depth for fiscal years 1990, 1992, and 1995-2015. However, there are not USFS data for every county for 2015. As such, for continuity, I restrict my analysis to fiscal years 1995-2014. I summed school districts' budget data by county to ensure I was looking at how county level funding impacts the school district.

The dataset is broken down into relatively specific categories both for expenses and income. Based on the description of the category and the nature of the USFS payments, I examine fluctuations in variable C20 (labeled Federal Revenue - Thru State - Other) to determine how directly fluctuations in the 25% Fund payments and SRS payments affect budgets.

Table 2 showcases some of the key statistics concerning the USFS payments and variable C20.

Table 2: Statistics about variables of concern

	C20	USFS
Mean	$2,046,896.00	$779,639.30
High	$303,838,847.00	$42,777,540.00
Low	$0.00	$0.00
Standard deviation	$7,460,517.00	$2,374,878.00
N	9,253	9,253

Figure 4 illustrates how variable C20 tracks with variations in the USFS payments. As shown in the figure, I observe no obvious increase in school district's

average federal funding at the passage of the SRS in 2000. However, this may simply be masked by heterogeneity across rural and non-rural counties.

I drop all counties that are missing observations for any of the years from 1995-2014 (excluding 2000) to ensure that I'm only examining counties that have data for all years in the sample. Since I lead my data, I end up with no estimate for 1995 or 2014. This leaves me with a total of 487 counties in my dataset, over a span of 17 years (excluding 1995, 2001, and 2014 because of the lead) for a total of 8,279 observations.

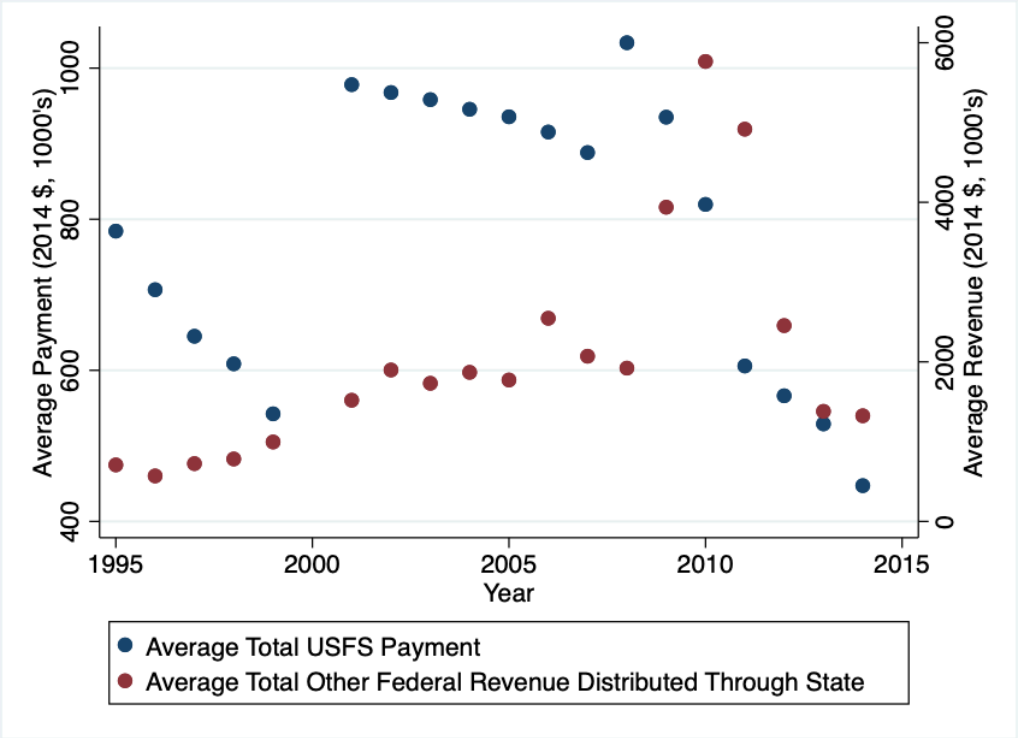

Figure 4

While the picture painted by Figure 4 does not clearly indicate that C20 tracks well with the average total USFS payments, when broken down by categories suggested by Gebert et al. (2004), the picture becomes clearer. The categories are as follows:

1. The payments are given to counties as extra money. Includes CA, NV, ID, UT, ND, SD, OK, TX, MS, FL, NC, SC, KY, OH, WV, and NY.

2. The payments are partially deducted from the total amount a state allocates a county and partially given to the county as extra money. Includes NM.
3. The payments are given to counties as extra money and/or they decrease the district's total tax burden. Includes MN, WI, MI, IL, AL, GA, VA, NH, and AK.
4. The payments decrease the district's total tax burden. Includes AZ, PA, and VT.
5. The payments are deducted from the total amount a state allocates a county. Includes WA, OR, WY, CO, NE, MO, AR, LA, and TN.
6. The payments stay at the county level and are not taken into account by the state. Includes MT, IN, and ME.

Figure 5, from Gebert et al. (2004), illustrates how these categories are distributed by state:

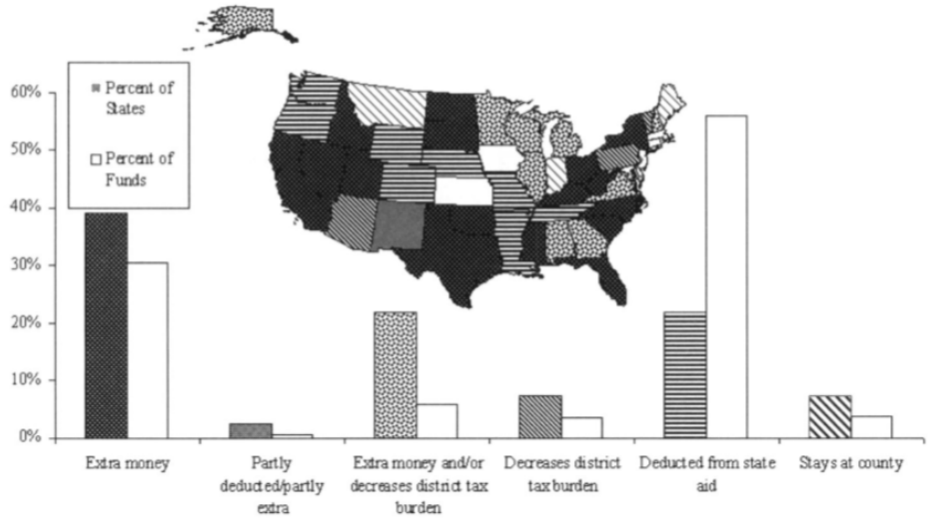

Figure 5

Figure 6 shows how C20 tracks with each of these categories:

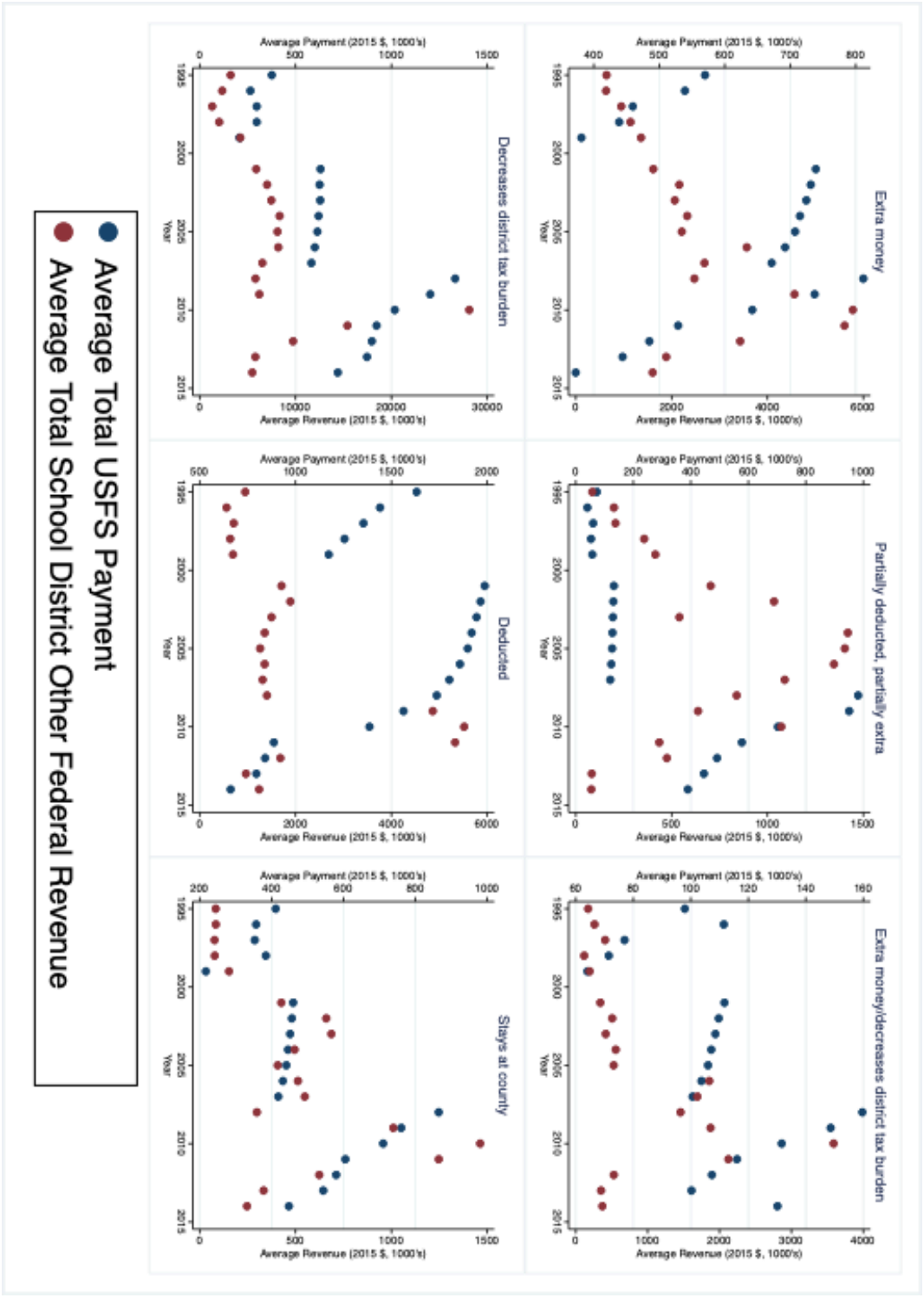
Average Total USFS Payment
Average Total School District Other Federal Revenue
Extra money
Partially deducted, partially extra
Extra money/decreases district tax burden
Decreases district tax burden
Deducted
Stays at county
Average Payment (2015 $, 1000's)
Average Revenue (2015 $, 1000's)
Year

Figure 6

IV. Methods

My interest is in determining the effects of the total USFS payments on school district budgets. I use the variable C20 from the Local Education Agency (School District) Finance Survey (F-33) Data, which measures other federal revenue distributed through the state. To begin, I estimate the following OLS model, Equation 1:

$$C20_{i,t+1} = \beta_0 + \beta_1 USFS_{i,t} + \lambda_i + \theta_t + u_{i,t} \quad \text{Eq. 1}$$

Where:

- i — county
- t — year
- *C20* — school district income
- *USFS* — federal payments
- λ — county fixed effect
- θ — year fixed effect
- u — unobserved term

Notably, λ , the county fixed effect, captures time invariant factors at the county level, and θ, the year fixed effect, captures annual shocks that are common across all counties. The variable u is the unobserved term that includes all unobserved factors that affect $C20$. I cluster the standard errors at the county level and weight each regression by the amount of USFS land in the county.

If I had exogenous variation in $USFS$, the parameter β_1 would measure the causal effect of an additional dollar from the USFS on the school district budgets. Gebert et al. (2004) suggest that for each dollar of USFS payments, school districts receive approximately 37 cents. However, while this implies that school districts would increase

spending by one third of their county's total USFS payment, it's unlikely that school districts directly receive one third of the USFS payments. In particular, if USFS funding crowds out other income sources, then we would expect the causal effect to be less than one-third.

Table 3 shows the results of Equation 1. The results suggest that each additional dollar of *USFS* is correlated with approximately 10-12 cents of federal spending in the school district. This estimate is statistically different from zero at the 10-percent level and is much smaller than the one third measure suggested by Gebert et al. (2004). The estimate is also statistically different than Gebert et. al.'s (2004) at the 1-percent level.

Table 3

	(1)	(2)
USFS	.102	.123
	(.055)*	(.074)*
t-statistic (different from 0)	1.84†	1.65†
t-statistic (different from 0.37)	4.87†††	3.34†††
State linear time trend	no	yes
N	8,279	8,279
R^2	.658	.668

Robust standard errors clustered at the county level are reported in parentheses.
* (0.10), ** (0.05), and *** (0.01) denote significance levels.
† (0.10), †† (0.05), and ††† (0.01) denote significance levels.

OLS estimation of the model displayed in Equation 1 is problematic because we assume that variation in *USFS* is exogenous. We should expect that there are unobserved factors that may be correlated with both USFS payments and federal revenue distributed through the state (variable C20). For example, if USFS payments are high one year, then the state may divert other forms of federal funding from the county. Essentially, USFS

payments could crowd-out state funding. Additionally, the state's allocation to school districts may correlate with the local economy and timber prices, causing $USFS$ to be endogenous.

To address this issue, I use a two-stage least squares (2SLS) approach. I use the implementation of and changes to the structure of SRS as an instrument in my model. My instruments are each year the program is in place in my data range (2001-2014) interacted with the intensity of treatment. For intensity of treatment, I use the set percent of the state's SRS funding that is allocated to the county, based on the percentage of a state's total USFS land contained in the county. For example, Bibb County, Alabama contains 8.2% of Alabama's USFS land and receives 8.2% of Alabama's total USFS income from the programs. Since the program changes across time, I interact each year by the intensity of the program (*percent*).

A valid instrument or set of instruments, $\hat{Z}$, in the 2SLS must meet two conditions:

1) The exclusion restriction, which requires that the instrument or set of instruments is excludable from the model. In essence, $\hat{Z}$ must not affect the variable $C20$ other than through our dependent variable, *USFS*.
2) $\hat{Z}$ is correlated with the endogenous regressor, $USFS$.

I expect that the only effect that the SRS has on *C20* is through changes in *USFS*. As such, I do not expect the first condition to be violated as $\hat{Z}$ will only affect *C20* through *USFS*. This assumption is not empirically testable, but the second assumption is. I expect that the implementation of and changes to SRS changed USFS payments to the county. Thus, it meets the second condition required as a valid instrument, but I show this

empirically with Eq. 2 and Table 3. Specifically, I estimate a first-stage regression to show the relationship between the instrument and $USFS$.

Note, my dataset begins in 1995 so that I have a pretreatment time period. Furthermore, I continue to include a county fixed effect in the model. Therefore, the instrument is picking up the effect of the policy on $USFS$.

Equation 2 presents the first-stage regression for the 2SLS strategy:

$$USFS_{i,t} = \beta_0 + \sum_{i=2001}^{2014} \beta_i \ percent \times 1(year = i) + \lambda_i + \theta_t + u_{i,t} \quad \text{Eq. 2}$$

The first-stage equation is effectively a year-specific dosage or intensity difference-in-difference model. Note, different counties are affected at different levels depending on dosage or the intensity of treatment (percent of the state allocation). Table 4 shows the results of the first-stage regressions. Like Table 3, I show two specifications, one as displayed in Equation 2 and the other which includes a state linear time trend.

Table 4: First Stage

	(1)	(2)
2001*percent	4,526,462	3,796,414
	(1,381,474)***	(1,353,810)***
2002*percent	4,410,591	3,518,311
	(1.358,954)***	(1,330,229)***
2003*percent	4,282,247	3,227,733
	(1,325,626)***	(1,299,441)**
2004*percent	4,118,159	2,901,413
	(1,286,353)***	(1,265,051)**
2005*percent	3,990,488	2,611,510
	(1,257,447)***	(1,244,925)**
2006*percent	3,731,650	2,190,439
	(1,204,116)***	(1,201,557)*
2007*percent	3,382,947	1,679,503
	(1,144,871)***	(1,154,257)
2008*percent	7,569,800	5,704,123
	(2,421,325)***	((2,503,984)**)
2009*percent	6,294,577	4,266,667
	(2,330,303)***	(2,422,299)*
2010*percent	3,975,594	1,785,451
	(1,876,132)**	(1,981,431)
2011*percent	1,202,165	-1,150,211
	(3,014,806)	(3,125,821)
2012*percent	1,058,123	-1,456,486
	(3,080,532)	(3,208,894)
2013*percent	601,899.3	-2,074,942
	(3,208,218)	(3,303,922)
F-test:	18.28	17.65
State linear time trend	no	yes
Year fixed effect	yes	yes
N	8,279	8,279
R^2	.894	.9071

Standard errors clustered at the county level are reported in parentheses.

* (0.10), ** (0.05), and *** (0.01) denote significance levels.

Notably, the table shows the F-statistics for the exclusion of my set of instruments. The convention for having a strong instrument, suggested by Staiger and Stock (1997), is to have a joint F statistic of 10 or higher. Having an F-statistic lower than that indicates that there may be an unacceptable level of bias in our instrument (Yamano, n.d.). My instruments have F-statistics well above 10, indicating that they are strong instruments.

Using these instruments, I estimate the 2SLS model with standard errors clustered at the county level:

$$C20_{i,t+1} = \beta_0 + \beta_1 USFS_{i,t} + \lambda_i + \phi_i + u_{i,t} \quad \text{Eq. 3}$$

To ensure that I'm not missing any delayed impacts of the payments, I also report results where I lead school district income by two and three years, in addition to the initial lead. This ensures that I can see if the payments potentially come into a county later than the Congressional Research Service suggests (Congressional Research Service, 2017).

Table 5 shows the results of the 2SLS. As shown in the table, none of the estimates are statistically significant, even at the ten percent level. This indicates that the payments do not have an effect on school district budgets statistically different form zero. The results are further discussed below.

Table 5: Two-stage least squares

	(t+1)	(t+1)	(t+2)	(t+2)	(t+3)	(t+3)
USFS	-.087	-.068	.105	.020	.193	-.144
	(.824)	(.689)	(1.023)	(.979)	(.635)	(.652)
State linear time trend	no	yes	no	yes	no	yes
County fixed effect	yes	yes	yes	yes	yes	yes
Year fixed effect	yes	yes	yes	yes	yes	yes
N	8,279	8,279	7,305	7,305	6,818	6,818
R^2	.657	.667	.669	.676	.684	.689

Standard errors clustered at the county level are reported in parentheses.
* (0.10), ** (0.05), and *** (0.01) denote significance levels.

To refine the analysis, I run the same regressions on states grouped by Gebert, et al.'s (2004) categories. I split the states into two categories: states that directly receive financial benefit from the program and states where USFS funding is taken into account when allocating other funding. The states that take into account the funding and deduct that total from other state funding are WA, OR, WY, CO, NE, MO, AR, LA, and TN. I call these Type 2. All other states' counties receive some direct benefit from the USFS payments, in one way or another. I call these Type 1. The results of the first stage regression (identical to Eq. 2 other than being split into two categories) are shown in Table 6.

Table 6: First Stage by Types

	Type 1	Type 1	Type 2	Type 2
2001*percent	3,847,037	3,659,419	2.04e+07	1.71e+07
	(1,313,272)***	(1,234,409)***	(8,875,722)**	(9,962,131)*
2002*percent	3,771,785	3,542,475	1.95e+07	1.55e+07
	(1,308,316)***	(1,216,037)***	(8,617,852)**	(9,979,477)
2003*percent	3,686,048	3,415,045	1.86e+07	1.38e+07
	(1,295,486)***	(1,192,910)***	(8,201,975)**	(9,853,944)
2004*percent	3,576,814	3,264,118	1.74e+07	1.19e+07
	(1,280,846)***	(1,170,279)***	(7,693,684)**	(9,651,525)
2005*percent	3,491,383	3,136,994	1.65e+07	1.03e+07
	(1,269,904)***	(1,154,212)***	(7,293,589)**	(9,570,692)
2006*percent	3,318,181	2,922,100	1.47e+07	7,692,366
	(1,249,141)***	(1,130,738)***	(6,484,374)**	(9,128,781)
2007*percent	3,084,847	2,647,073	1.22e+07	4,461,744
	(1,224,318)**	(1,106,332)**	(5,400,002)**	(8,475,731)
2008*percent	7,903,364	7,423,897	931,371.4	-7,491,858
	(2,523,400)***	(2,633,597)***	(1,169,573)	(4,905,877)
2009*percent	6,946,167	6,425,007	-6,083,841	-1.52e+07
	(2,381,773)***	(2,524,221)**	(3,030,347)**	(4,710,451)***
2010*percent	4,909,967	4,347,115	-1.30e+07	-2.29e+07
	(1,667,712)***	(1,830,049)**	(6,160,812)**	(6,094,414)***
2011*percent	3,708,599	3,104,053	-4.25e+07	-5.32e+07
	(1,593,299)**	(1,793,937)**	(2.01e+07)**	(1.82e+07)***
2012*percent	3,624,495	2,978,257	-4.35e+07	-5.49e+07
	(1,501,952)**	(1,711,985)**	(2.08e+07)**	(1.89e+07)***
2013*percent	3,195,250	2,507,320	-4.44e+07	-5.64e+07
	(1,526,087)**	(1,671,731)	(2.09e+07)**	(1.88e+07)***
F-test:	29.61	28.75	4.83	42.05
State linear time trend	no	yes	no	yes
Year fixed effect	yes	yes	yes	yes
N	5,831	5,831	2,448	2,448
R^2	.885	.901	.931	.941

Standard errors clustered at the county level are reported in parentheses.
* (0.10), ** (0.05), and *** (0.01) denote significance levels.

While some of these coefficients may be interesting in their own regard, the main factor of interest is the F-statistics for each regression. Notably, most of my F-tests yield encouraging results—all but the third of the F-statistics indicates that my instruments are strong.

This 2SLS regression yields 4 separate results, listed in table 7.

Table 7: Two-stage least squares by type

	Type 1	Type 1	Type 2	Type 2
USFS	-.266	-1.026	.174	.159
	(1.098)	(1.263)	(.054)***	(.103)
State linear time trend	no	yes	no	yes
County fixed effect	yes	yes	yes	yes
Year fixed effect	yes	yes	yes	yes
N	5,831	5,831	2448	2448
R^2	.679	.682	.485	.499

Robust standard errors clustered at the county level are reported in parentheses.
* (0.10), ** (0.05), and *** (0.01) denote significance levels.

The only of these results that is statistically significant at all is the third regression, but since the set of instruments for that regression only have a F-statistic of 4.83, this estimate is unreliable.

VI. Discussion

The null results from Table 4 are potentially interesting for several reasons. Most interesting would be that that when states distribute the funding, they take it into account and do not allocate other funding to the county (the USFS funding crowds out other state funding). Gebert et al. (2004) indicate that some states do this explicitly. But, as shown by Table 6, even states that explicitly pass through the payments don't see any significant effect from the payments.

It is also possible that states expect the funding and smooth for it in expectation. However, I find this unlikely, as the renewal of the Secure Rural Schools Act is relatively uncertain from year to year. For example, the Act was reauthorized with the passing of

the 2018 Farm Bill, but it was only renewed for 2017 and 2018 payments. It's currently unclear whether or not the Act will be renewed for 2019, and as such, there's no way for school districts to appropriately plan for the payments. Some county officials have explicitly stated that they don't plan for the renewal of the program, since it's so uncertain. County Commissioner Mark Whitney of Beaver County, Utah, said in a hearing before the U.S. Senate Committee on Energy and Natural Resources, "I can tell you now, I know that I speak on behalf of a whole lot of county commissioners throughout this country, there is nothing more frustrating than trying to create a budget without certainty in revenues. And each year we go into a budget doing that, not knowing whether PILT and SRS is going to be funded. We would like to have some sort of certainty" (Federal payments to local governments provided through the Secure Rural Schools and Community Self-Determination Act and the Payment in Lieu of Taxes Programs and the need to provide greater fiscal certainty for resource-dependent communities with tax-exempt federal land, 2017).

Advocates of the program state that uncertainty in the payments has major impacts on the stability of counties. While this still could be true in respect to other programs in the county (remember that 25% and SRS payments can also be used for spending on public roads), it's not true of the impacts on school districts. This paper is the first to empirically show that the payments have little impact on school district budgets, despite claims that schools rely heavily on income from the USFS.

The 2SLS findings in the paper must be understood in the context of a local average treatment effect, meaning that my analysis is relative to additional USFS income distributed to the county through more generous federal legislation of the SRS program.

Therefore, my findings are relevant to the partial equilibrium outcomes. Nevertheless, legislation that completely overhauls the SRS or removes all USFS funding may significantly impact school district budgets.

VII. Conclusion

In answer to Gebert et al.'s (2004) question, no, the Secure Rural Schools Act of 2000 does not appear to make rural schools secure. Rather, it seems to have no impact on school district budgets, despite claims from advocates of the program that the funding is crucial for rural schools. Using an instrumental variable, I've demonstrated that the payments have no discernable causal impact on county school district budgets.

My results demonstrate that there likely is crowding out of state funding caused by the Secure Rural Schools program. Although the several hundred million dollars spent on the program is but a drop in the bucket of the overall federal budget, changes to the program, like making payments directly to counties rather than through the state, could likely have greater impacts on making rural schools secure.

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