

An Analysis of Federal Forest Payments on Oregon Counties' Budgetary Decisions

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Abstract: This paper examines the impacts of the gradual decrease and final expiration of the federal safety net payments on counties across the state of Oregon. These payments have been a large component of the revenues of local Oregon governments for many years. We examine changes in county expenditure categories and county budget compositions caused by the decrease in payments, as well as changes in general reserve fund balances at the county level. Additionally, the relationship between property tax levels and these federal payments is also investigated. We find that counties, on average, have not yet adjusted expenditure levels in response to changes in timber safety net payments, but that general reserve funds have been reduced. We also find that counties that historically received large timber payments have, on average, a systematically lower property tax rate than their counterparts receiving little to no payments at all.

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INTRODUCTION

Federal lands in Oregon make up over 50 percent of the state's land base. Oregon counties are unable to tax these lands which, in some cases, similarly comprise over half of a county's total area. In order to tackle the issues associated with these appropriated federal lands, the federal government has shared timber revenues with Oregon counties since 1908. The objective of this revenue sharing was to compensate the counties for the revenue streams they were unable to generate. However, yearly federal payments have been reduced from over \$230 million in 2008 to approximately \$100 million in 2011, after which all safety net payments are scheduled to expire.

This phase-out plan has put immense pressure on counties in the state of Oregon, particularly rural counties whose road and operating budgets rely heavily on the payments. News agencies throughout the state have reported many Oregon counties, including Lane, face potential cut-backs and changes in budgetary decisions. For instance, the sheriff's office in Curry County has made mention of tackling the budget cuts by closing a jail and ending road patrols, while commissioners may be forced to cut 50 to 70 employment positions. With these payments set to expire, Oregon congressmen, including Lane County's representative, Peter DeFazio, have proposed a plan to substantially increase timber harvests to compensate for the drop in payments, bringing about a completely different set of environmental and sustainability concerns. Needless to say, there are countless issues, reactions, and forthcoming plans to address the decrease in these payments, which have sustained, to varying degrees, many communities in the state of Oregon.

Although a widely covered local political issue, scarce academic research has been conducted regarding the payments. This paper will provide a short run and long run analysis of these timber receipts on local governments. The short run analysis will focus on estimating the effects of the timber payments on Oregon counties' expenditure budgets and their reserve funds. The long run analysis will focus on developing an explanatory model of property tax rates and the impact of timber revenues on county property tax rates.

HISTORY OF THE TIMBER PAYMENTS

I. *Timber Receipts and Secure Rural Schools Act*

The history of federal payments to timber producing counties in Oregon dates back to 1908 when federal law specified that 25 percent of harvest receipts from Forest Service lands would be distributed to counties. This was an important source of income for these Oregon counties, as more than 50% of the land base in Oregon was, and continues to be, federally owned. The US Forest Service is in control of 14.3 million acres of land throughout the state, while the Oregon and California Lands (O&C Lands) make up 2.2 million acres through Southern and Western Oregon. As a result, local taxes are not collected on the lands, and the income generated from the forests cannot be taxed by local jurisdictions.

In 1937, the Bureau of Land Management began paying Oregon counties a portion of the revenue generated by BLM lands within the respective counties. This land was managed under a different set of guidelines than the US Forest Service lands. These lands were governed by the O&C Act passed specifically for the "Oregon & California Counties". The aim of this act was to remunerate counties for BLM owned forests located in Southern and Western Oregon. Sharing of

timber sales receipts from these lands were originally set at 75 percent, but subsequently decreased to 50 percent for the counties within which revenues were generated. These funds were allocated to the counties' general funds to be used for road projects, public safety, and other county services. The remaining 25 percent of the original 75 percent originally allocated to counties was returned to the federal government and used to better manage these O&C lands. This has been referred to as the "plowback" fund and is used for purposes such as road maintenance, land use planning, and surveying, among others.

Oregon is a major lumber producing center in North America and historically the logging and woods products industry were the foundation of the state's and the counties' economy. The timber industry experienced a prolonged period of high output through the 1980s, but in the early 1990s timber production slowed down rapidly due to a confluence of events, including the proposition and implementation of the Northwest Forest Plan, and the restriction of lands available to logging due to the status of the Northern Spotted Owl as a threatened species. Much of the threat to the spotted owls was a result of habitat loss attributed to the logging of forests throughout the Northwest. By the end of the 1990s, timber production in forests controlled by the federal government had fallen 90 percent (Task Force 13). This sharp reduction in logging resulted in a dramatic decrease in the revenue generated by logging on federal forests within Oregon, which consequently brought about sharp declines in the federal funds received by local, often rural, Oregon counties. The federal government first attempted to assist these counties with the Omnibus Budget Reconciliation Act of 1993 (PL103-66). This act provided "safety net" payments to counties losing timber revenue due to logging restrictions for the protection of the spotted owl. The payments were to scale down over time until 2003, at which point this safety net would expire. However, this act would be nullified in the year 2000 by new legislation. The

purpose of this new legislation was to expand federal assistance to counties affected by forces other than the Spotted Owl. The spotted owl safety net provided government assistance mostly to Western Oregon counties, but did not include other counties in Eastern Oregon, nor did it address the general decrease of timber receipts throughout the nation. Subsequently, these safety net payments were replaced by the Secure Rural Schools and Community Self-Determination Act (PL106-393) which was larger in scope and affected not only counties suffering from reduced logging in Oregon, but rural counties throughout America.

In 2000, the Secure Rural Schools and Community Self-Determination (SRS) Act was passed by the US Congress. This act applied to rural counties across 42 states and its purpose was to compensate for lower forest revenues for counties and schools. The payments were divided among three titles:

- Title I comprised 80 to 85 percent of the total safety net payment to each county and was to be used for general county services, roads and schools.
- Title II and Title III comprised the remaining 15-20 percent of the payments, which were to be split at the counties' discretion according to criteria established by the SRS Act.

Of the criteria for use of Titles II and III, one major criterion relates to county population. Title II funds are to be used for environmental undertakings and restoration under the recommendations of a local Resource Advisory Committee, which were to be established by each county wishing to utilize Title II funds. The remaining payments composed Title III. These monies were for services directly related to the federal lands themselves. Acceptable uses include upkeep of rural forest roads, search and rescue operations, and wild land firefighting

(Secure Rural Schools Program, 2008-2011). The formula used to determine the size of the payment to each county was based on previous timber harvest averages (a 3 year average of the largest payments between 1986-1999), federal acreage within each county and per capita personal income (US Forest Service 12). The original enactment of this law was valid for five years. At the end of 2006 the original act expired, but a one year emergency extension was passed.

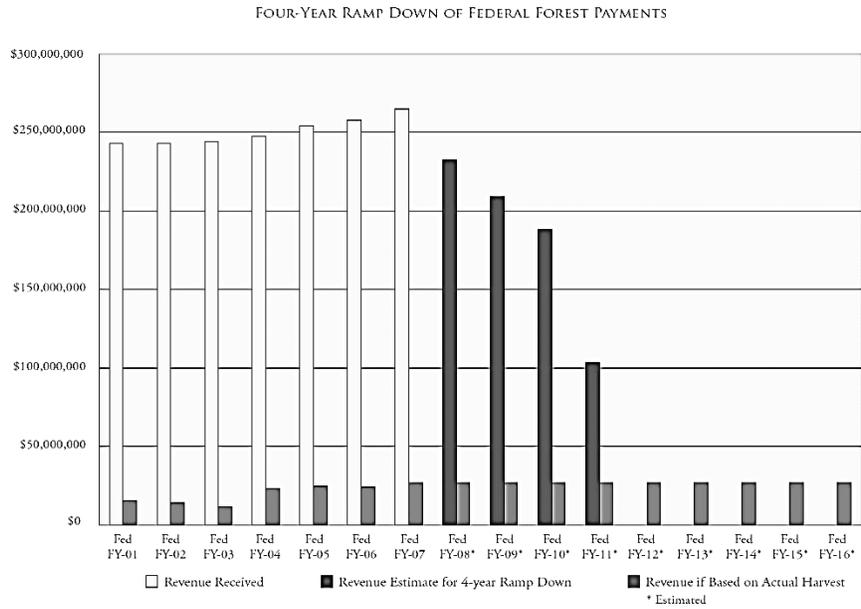
In 2008 the Secure Rural Schools Act was reauthorized for an additional four years, but with the payments set to decrease gradually for each of the act's four years, until they expired in 2011. This phase out plan used the following yearly percentage decreases (see Figure 1):

- 2008-09 = 90 percent of the amount received in the federal fiscal year ending Sept. 30, 2006 (FFY 2006);
- 2009-10 = 81 percent of the FFY 2006 amount;
- 2010-11 = 73 percent of the FFY 2006 amount; and,
- 2011-12 = 40 percent of a new formula-based amount that is estimated to yield between 40 and 50 percent of the FFY 2006 amount.

Source: Oregon Task Force

As the Secure Rural Schools Act expires, the amount of money flowing into rural counties in Oregon will drop off dramatically. Receipts from timber harvest on federal lands will still be shared with the counties from which they were generated according to the revenue sharing laws in place prior to the implementation of the Spotted Owl safety net in 1993 and the Secure Rural Schools Act. However, the size of these payments is a small fraction of the payments rural counties have been receiving.

Figure 1



Source: Oregon Task Force

II. *Property Tax Rates*

The property tax system is a critical source of revenue for the more than 1,300 local taxing districts within the counties of the state of Oregon. For the fiscal year 2011-2012, the state’s local governments recorded \$5.1 billion in revenues from property tax rates. The taxes are calculated using county and taxation offices’ assessment of property values within their boundaries and the use of a hybrid of levy based and rate based systems. County assessors appraise the majority of property in Oregon. The properties subject to taxation range from all privately owned real property such as land, buildings, and fixed machinery and equipment to manufactured homes and personal property used for business purposes. Each year during the month of September, county assessors place property taxes on the tax roll as a rate per \$1000 of assessed value.

Until the 1990s, property tax rates in Oregon were administered under a pure levy property tax system, where each taxing district calculated its own tax levy based on yearly budget needs. Real market values and assessed property values were equal, and the levy was divided by the total real market value of properties in a district to arrive at a district tax rate. Taxes for each property were determined by adding the tax rates for all relevant taxing districts resulting in a consolidated tax rate. This rate would then be multiplied by the assessed value of the property. The growth rate of the levies was capped at a 6% growth, while any growth rate above this benchmark required voter approval. However, in the early 1990's two statewide ballot measures transformed the system: Measures 5 and Measure 50.

Property taxes in Oregon are subject to these two statewide ballot measures which led local governments to use the hybrid of levy based and rate based systems that is currently in place. In 1991-1992, Measure 5 placed limits on the taxes imposed on individual properties. To this day the limits remain at \$5 per \$1000 real market value for school taxes and \$10 per \$1000 real market value for general government taxes applied only to operating taxes (omitting bonds). Such a limit is called a compression and the subsequent tax rate decrease is known as a compression loss. In 1997, Measure 50 was passed in order to reduce property taxes in 1997-1998 and control future tax rate growth. It did so by shifting district permanent authorities from levy based to rate based, reducing assessed values of individual properties and limiting the annual growth of assessed values. The assessed value of a property, the value subject to taxation, was set at 90 percent of a property's 1995-1996 real market value (RMV). Measure 50 limited the annual growth of assessed values to 3 percent per year (under the assumption that a property did not incur significant improvements and renovations). The objective of both measures was to

limit property tax rates and as such, measures 5 and 50 resulted in annual growth of 5.3 percent since 1997-1998 versus 9 percent annual growth during the 1980s.

SHORT RUN ANALYSIS:

Impact of Federal Forest Payments on Oregon Counties' Expenditures

I. *Literature Review*

There has been a dearth of academic studies looking into the relationship between the timber payments doled out each year and the local governments who receive them. Studies regarding the impact of these payments upon counties in Oregon have likewise been rare. Of the few studies done in the past, two utilized an Input/Output model to attempt to capture the impacts that the loss of these federal payments will have on jobs and output at the state and county levels. One of these studies, finished in 2007 before the reauthorization of the Secure Rural Schools Act for another four years, was commissioned by the Association of O&C Counties. The report, titled *Secure Rural Schools Payments Termination: Impacts on Oregon's O&C County Economies*, looks at potential economic impacts on eighteen counties in Western and Southern Oregon resulting from the termination of these payments. The direct impacts were then used to estimate total impacts on the economy by estimating multiplier effects and indirect impacts. Using the Input/Output model, job losses and economic earnings were analyzed. After looking at each county's individual potential outcome, the estimates are aggregated forming an estimate for total impact on the eighteen O&C Counties combined. The study found large and widespread job loss and decreased economic activity throughout the counties studied.

An additional study has been conducted by Oregon State University's department of agricultural economics (*Economic Impacts on Oregon of the Termination of Secure Rural Schools Payments to Counties 2011 Update*). There have been two other updates of this paper, one in 2008 and one in 2009. This working paper also utilizes an Input/Output model to analyze possible effects of the end of the payments. The Input/Output model used is an IMPLAN model. The paper investigates changes in employment, economic output, and value-added in the Oregon economy following the end of the payments. Changes in the counties' general funds and road funds are both modeled as shocks to the economy from decreases in spending. However, the possibility of counties increasing revenues in other ways is neither considered nor modeled. The assumption is that these funds will simply be lost, without replacement. The estimates are based on cuts being made in line with current budget allocations, with subsequent models examining varying levels of cuts coming directly from personnel.

Predicted job loss in the 2008 version was 3,382 positions compared to 3,539 and 3,833 jobs lost in the 2009 and 2011 updates, respectively. This shows that estimated job loss from the termination of these payments has not varied much over time, with estimated impacts increasing over time as the payments were reduced. In these models, state losses are considered without any further break downs by county or region, leading to a less clear version of what the end of this program actually means to each county within the state. However, this is a relatively new paper, having come out in November 2011. The estimated dollar value decreases in output and value added from the state economy were estimated to be \$384 million and \$250 million respectively, in the 2011 update. As with the employment numbers, the previous estimates for these two areas were smaller. In 2008 output loss was estimated at \$343 million and value added loss at \$220

million. The 2009 estimates were an output loss of \$359 million and a value added loss of \$230 million.

In addition to the two aforementioned studies, there is also a report published by a task force commissioned by former Oregon governor Ted Kulongoski. The task force looked at the situations counties would face following the last Secure Rural Schools payments, assuming no changes. The task force further made recommendations at the county, state, and federal levels which could be implemented to attempt to recoup county funds lost. The task force was made up of a variety of elected officials, both at the local and state level, as well as employees of the state in certain fields; i.e. sheriffs and policy analysts. The report lays out a solid foundation of information regarding the history of the federal government's payments to counties in Oregon, the budget shortfalls that would be faced at the previous spending levels, and possibilities for recovering some of the lost funds. Suggestions include increased logging, sharing a larger proportion of timber receipts, and increased local taxes, among many others. The report also attempts to estimate, holding all else constant, what percentage of lost funds these measures could gain back. However, there is minimal data analysis within the report. Relationships between funds, services, and possible reactions to fund losses are not addressed. This report is focused on determining the losses attributable to the phase out of the payments and what the responsibilities of different governmental levels should be in times of crisis rather than what services and employment will look like in these times. What the threshold level of services counties need to provide, which services the counties can assign the state, and the proper way for counties to deal with budget shortfalls and possible bankruptcy are major issues.

Concerning reserves, research has been done on the adjustment mechanisms employed by local governments in order to cope with revenue shocks. Studies have been conducted at local levels of government both within the United States as well as abroad.

A study conducted in Norway by Rattsø and Tovmo (2002) looked at local governments' reactions to changes in revenue shocks. It found that fiscal deficits were avoided through both expenditure and revenue adjustments (i.e. increasing taxes). These adjustments were found to be asymmetric across scenarios, with a positive shock in revenues having a lesser effect on tax rates than a negative shock. However, in Oregon there are constitutional limits to tax increases, with property taxes locked in at certain levels, making certain adjustments unworkable within our local governments.

An additional study of German states by Rodden, (2005) found that those subnational governments that have a rational belief they will be bailed out if necessary are much more likely to accumulate debts and avoid or delay adjustments to revenues and expenditures. This was done by comparing states in Germany whose governments expected, based on past experiences, they would not have been allowed to fail with those states that had no such belief, meaning that some of these local governments had more reason to fear insolvency without federal support and acted accordingly.

The findings of the Norwegian study are corroborated by the results of an analysis conducted by James Poterba (1994), who looked at state level governments within the USA. He found a variety of estimates for the impacts of negative revenue shocks upon expenditures under different models and discovered that deficits have a larger impact on government expenditures than surplus revenue supplies, i.e. unexpected positive shocks.

Additionally, a study conducted by Pagano and Johnston (2000) looked at city level spending. They found that those cities with higher property tax reliance do not generally grow reserve funds at a fast pace. Relatively speaking, those cities with more diversity with regard to revenue streams, increase reserve funds more quickly. While revenue generation capacities are beyond our scope, it is nevertheless worth keeping these results in mind. The suggestion being that the greater the reliance counties have on payments from the federal government, the harder it may be to increase reserves in any meaningful way. This is an important note, as we believe that county governments may have been spending reserve funds over the last few years to hold services unaffected.

Finally, a 1999 study (Figlio, Kolpin, Reid), analyzed whether local U.S. governments set policies that take into account the policies of neighboring states. The purpose of this study was to determine whether local governments play strategic games when it comes to implementing welfare benefits. The results indicated that states do indeed take into account programs and protocols of their neighbors when setting policy. While this result may seem beyond the scope of our current study, it is perhaps worthwhile to extrapolate this information to our findings. If local governments do engage in strategic games, as this paper suggests, then counties within Oregon may well be doing the same. Counties may find it easier to use reserves or to make cuts to certain programs depending on the choices of neighbors. One county may be hesitant to make certain cuts if they are the only one to do so, while it may be reassuring to spend reserves knowing that others are as well. This idea of strategically choosing with regard to other local governments could indeed be having an effect on the budgetary patterns of our governments at the local level.

II. *Research Questions*

The purpose of this short run analysis is concerned with addressing three possible explanations of Oregon counties' responses to the phase-out plan of the SRS act. There appeared to be three possible ways for counties to respond to the gradual loss of federal timber payments:

1. **Adjustments in expenditure budgets:** Given the decreases in timber payments, counties might have begun cutting expenditures in line with the levels of the payments. The reasoning behind this strategy implies counties would allow for a gradual reduction in expenditures over time as opposed to a drastic reduction at one point in time, a transition strategy rather than a shock.
2. **Use of reserves, possibility of a renewal of payments:** It is also possible that Oregon counties were confident that the timber payments would be renewed in 2011. Intuitively, it might be rational for counties to expect a renewal in the payments knowing that they had been renewed in the past several times. In this scenario, they may have used reserves in the expectation that funds would one day be again available.
3. **Use of reserves, no renewal of payments:** Counties may have also believed that the timber payments would not continue past 2011 but felt that nevertheless reserves should be used and any budgetary reductions should be saved for the future when other options were no longer available.

With these hypotheses in mind, this short run section investigates how counties' budgets changed in response to these lower payments. If expenditure budgets were affected, we might predict disproportional allocations of funds among different services in which case we might

witness a change in the composition of counties' expenditures. By investigating how Oregon counties reacted on average to lower safety net payments, we might then be able to better predict what could be expected as the payments expired. Next, exploring the possible utilization of reserve funds by counties as a strategy to mitigate the effects of these payment decreases on expenditures might provide insight on counties' budget situations.

III. *Empirical Specifications*

i. **Expenditure Budgets**

We developed a base model in order to investigate the degree to which the timber payments resulted in changes and adjustments in counties' expenditures. In addition to this total expenditure model, three subset expenditure accounts that are likely influenced by timber revenues are also designed. These are the Road, Public Safety, and General Government expenditures. All base models are a function of the same variables. Subdivisions in the timber variables to account for the different payment restrictions for each title and type of payment (Forest Services or BLM) are also used to more accurately represent the payments to counties' particular expenditures.

We are assuming that the function of expenditures by counties is dependent on population, population density, and timber payment receipts.

$$Expenditures_{i,t} = f(Pop_{i,t}, PopDensity_{i,t}, Timber\ Payments_{i,t}) + \epsilon_{i,t}$$

This relationship gives the basic framework for all subsequent expenditure models.

Our initial development of a base model considers a county's total population, population density, and the timber payments (both BLM and Forest Services payments) using yearly data dating back to 2004. Using standard OLS methodology we can empirically specify this function into a regression giving the following result:

$$Total\ Expenditures_{i,t} = \alpha + \beta_1 Population_{i,t} + \beta_2 PopulationDensity_{i,t} + \beta_3 TimberPayments_{i,t} + \epsilon_{i,t}$$

This standard base model can already provide a preliminary interpretation of the effects of the payments and their subsequent decreases on the expenditure budgets of counties. Our preliminary expectation is that the coefficient for the timber payments be positive. Intuitively, this suggests that higher timber payments would result in higher levels of expenditures and likewise, lower payments would result in lower expenditures.

A more precise estimation is also possible by separating the Timber Payments variable and breaking it down into both the BLM and Forest Services payments as well as by relevant title. In the case of the road expenditure model, Titles I and III payments from both the BLM and Forest Services receipts are to be transferred counties. Accordingly, we can construct a more precise estimate of the Timber Payments variable by accounting for the Titles I and III payments into our model yielding the following result:

$$Total\ Expenditures_{i,t} = \alpha + \beta_1 Population_{i,t} + \beta_2 PopulationDensity_{i,t} + \beta_3 BLM(Title\ I + III)_{i,t} + \beta_4 FS(Title\ I + II)_{i,t} + \epsilon_{i,t}$$

This expenditure model framework can be further applied to the three subset expenditure accounts yielding the following results:

$$\bullet \quad \text{Road Expenditures}_{i,t} = \alpha + \beta_1 \text{Population}_{i,t} + \beta_2 \text{PopulationDensity}_{i,t} + \beta_3 \text{BLM(Title I + III)}_{i,t} + \beta_4 \text{FS(Title I + III)}_{i,t} + \varepsilon_{i,t}$$

$$\bullet \quad \text{Public Safety Expenditures}_{i,t} = \alpha + \beta_1 \text{Population}_{i,t} + \beta_2 \text{PopulationDensity}_{i,t} + \beta_3 \text{BLM(Title I + III)}_{i,t} + \beta_4 \text{FS(Title I + III)}_{i,t} + \varepsilon_{i,t}$$

$$\bullet \quad \text{General Government Expenditures}_{i,t} = \alpha + \beta_1 \text{Population}_{i,t} + \beta_2 \text{PopulationDensity}_{i,t} + \beta_3 \text{BLM(Title I + III)}_{i,t} + \beta_4 \text{FS(Title I + III)}_{i,t} + \varepsilon_{i,t}$$

ii. **Reserves**

Some important caveats must be taken into consideration before proceeding with the data description. Firstly, the heterogeneity of Oregon counties is quite significant. It is intuitive to think that counties located near or in metropolitan areas may rely significantly less on timber payments to support their expenditure budgets. Secondly, and perhaps most importantly, we are investigating whether counties have reserve funds which they may have used to compensate for the phase-out of the SRS payments while still preserving a more stable level of expenditures. This would suggest that the use of reserves will affect the significance of the expenditure regressions. Accordingly, by applying the same methodology of the expenditure base model to reserve funds, a more exact and significant effect of the BLM and Forest Services payments on counties can be explored. Similar to the expenditure model, the timber payments can be broken down by relevant titles:

$$\begin{aligned} Reserves_{i,t} = & \alpha + \beta_1 Population_{i,t} + \beta_2 PopulationDensity_{i,t} + \beta_3 BLM(Title\ I + III)_{i,t} + \beta_4 FS(Title\ I \\ & + III)_{i,t} + \epsilon_{i,t} \end{aligned}$$

This regression provides an explanatory interpretation of the timber payments on reserves held by counties.

IV. *Data Description*

Data collection was primarily concerned with obtaining counties' expenditure budgets and detailed payment information concerning both BLM and Forest Services payments as allocated to particular counties. The data obtained from the BLM and the US Forest Service was in the form of yearly payment statements to Oregon counties. In addition to the timber payment data, we have also obtained yearly county expenditures data. Each county's Comprehensive Annual Financial Report (CAFR) is accessible on the Oregon Secretary of State's website. The annual reports are collected by the Oregon Secretary of State and date back to 2004. These revenue statements contain the expenditure information for general government, public safety, and roads and bridges which are the three expenditure accounts we are interested in examining. Additionally, the data on population comes from the Census Bureau with the data set acquired from the Intercensal Estimates of the Resident Population of Counties for Oregon, which is published on a yearly basis. In order to obtain population density we acquired square mileage per county data from the Fedstats website and divided county population by county square mileage. Reserve Funds are also obtained from the counties annual reports. However, due to disparities in reporting methods among counties, we were only able to acquire reserve fund data for 16 of the 36 Oregon counties.

V. *Estimation Results and Analysis*

i. **Expenditure Budgets**

A logarithmic regression was performed using the aforementioned data grouped by the different expenditure budgets (total expenditures, road, public safety and general government). In addition to the base models, we incorporated two additional analyses (tables 1-2, 1-3) with increased variables in the regression. All regressions control for year effects (inflation) as well as county fixed effects to account for such things as historical expenditure differences.

Table 1-1 (*P-Values are listed below the coefficient estimates in parentheses*)

Variables	County Expenditures Results (logarithms)				Total Expenditures
	General	Road	Public Safety	Other	
Total Population	-36.8216 (0.213)	-17.15027 (0.559)	-33.01282 (0.279)	-17.43623 (0.496)	-19.02902 (0.513)
Population Density	54.38017 (0.092)	30.94954 (0.335)	54.54095 (0.102)	35.69467 (0.202)	37.91849 (0.233)
Per Capita Income					
Unemployment Rate					
BLM Payments	.0455842 (0.484)	-.0018085 (0.978)	.0528987 (0.432)	.0138621 (0.804)	.0247143 (0.70)
Forest Service Payments	-.0260862 (0.724)	.0232074 (0.752)	-.0267814 (0.726)	-.0121348 (0.848)	-.0024689 (0.973)
R²	0.8836	0.8839	0.8846	0.9161	0.9082
Adjusted R²	0.8683	0.8687	0.8694	0.9047	0.8962
Observations	432	432	432	420	432

Table 1-2 (*P-Values are listed below the coefficient estimates in parentheses*)

Variables	County Expenditures Results (+Income)			
	General	Road	Public Safety	Total Expenditures
Total Population	-29.80731 (0.313)	-11.94904 (0.689)	-25.57964 (0.402)	-12.17628 (0.672)
Population Density	45.64554 (0.160)	22.84664 (0.487)	44.86765 (0.182)	28.9131 (0.361)
Per Capita Income	.3210075 (0.902)	-.1646613 (0.950)	.1365194 (0.960)	1.02505 (0.687)
Unemployment Rate				
BLM Payments	.0502042 (0.421)	.005041 (0.936)	.0580007 (0.369)	.033126 (0.586)
Forest Service Payments	-.018487 (0.799)	.031841 (0.666)	-.0175663 (0.815)	.0070311 (0.921)
R²	0.8983	0.8954	0.8987	0.9220
Adjusted R²	0.8836	0.8802	0.8841	0.9107
Observations	396	396	396	396

Table 1-3 (*P-Values are listed below the coefficient estimates in parentheses*)

Variables	County Expenditures Results (+Inc+Unemployment)			
	General	Road	Public	Total

			Safety	Expendi- tures
Total Population	-33.94085 (0.272)	-17.16016 (0.543)	-30.9278 (0.331)	-19.00987 (0.521)
Population Density	49.10136 (0.163)	29.55222 (0.357)	49.8834 (0.168)	39.81864 (0.238)
Per Capita Income	1.78259 (0.542)	.9512971 (0.721)	1.663007 (0.580)	.5339809 (0.849)
Unemployment Rate	2.696346 (0.102)	1.755543 (0.244)	2.865145 (0.092)	-.4697002 (0.766)
BLM Payments	.0274037 (0.696)	-.0108929 (0.865)	.0255113 (0.724)	.0103811 (0.877)
Forest Service Payments	-.0084876 (0.910)	.0406625 (0.553)	-.0082367 (0.915)	.0117358 (0.871)
R²	0.8956	0.9117	0.8960	0.9221
Adjusted R²	0.8795	0.8981	0.8799	0.9101
Observations	352	352	352	352

These models represent the short run response of local governments to safety net decreases. Judging by the consistently high p-values, the regression results seem to suggest that there has been little systematic impact on county expenditures due to decreases in safety net payments. This would imply that counties have managed to hold their expenditures constant even amidst the phase out of the timber receipts. Expenditures have not changed anywhere near the degree that payments have. In the short run, it seems that counties have managed to hold themselves unharmed by these reductions. How have they done this? The most likely answer seems to be by drawing down their reserve funds to continue to provide the same services.

ii. **Reserves**

Using reserve funds in order to keep county level expenditures at a similar level throughout the reductions in safety net payments can easily be recognized as a worthwhile strategy. The purpose of these funds is to be utilized in situations in which other revenue sources are affected. It is intuitive to think that the uncertainty of future timber payment renewal and the four year phase out has forced counties to resort to using their reserves. The following table presents the results of the regression of the timber payments on reserve funds.

Table 1-4 (*P-Values are listed below the coefficient estimates in parentheses*)

Variables	Base Model	Model 2	Model 3
Total Population	-.0331002 (0.853)	-.345801 (0.083)	-.4335272 (0.113)
Population Density	.4325581 (0.007)	.5912473 (0.001)	.6339493 (0.007)
Per Capita Income		1.833717 (0.010)	1.725701 (0.045)
Unemployment Rate			-.2697419 (0.497)
SRS Payments	.1706637 (0.091)	.3677305 (0.002)	.2909997 (0.051)
R²	0.2793	0.3308	0.3586
Adjusted R²	0.2632	0.3085	0.3204
Observations	138	125	90

Table 1-4 shows the regression results for the base model of reserve funds iterated in the empirical section. Models 2 and 3 in the table incorporate additional per capita income and unemployment rate variables to test for additional explanatory power. The results are considerably more significant than for the expenditure regressions. Particularly, results from Model 2 in Table 1-4 indicate statistical significance of all variables at the 10 percent level.

From our results, total population is negatively correlated with reserve levels, meaning the more residents in a county, all else constant, reserves are lower. The opposite is true of population density and per capita income, both of which have a positive relationship with reserve fund levels. The unemployment rate, however, is not significant at any level within our model (Model 3).

Of notable importance is the SRS payment variable which is a combination of both the BLM and Forest Services payments to counties. The coefficient interpretation (.3677) suggests that a \$1 loss in SRS payments results in an approximate \$0.37 decrease in reserve funds. Overall, there is a clear indication that reserve funds are indeed affected by the changes in timber payments.

The SRS payments' coefficient estimate is an unusual and unexpected result. A coefficient estimate of 1 would be a more reasonable result. If expenditures are held constant, a dollar of revenue lost needs to be made up in full by some means. If county reserves are used to compensate for a loss of timber payments in full, a dollar of reserves would be needed in replacement, not just \$0.37. However, this \$0.37 coefficient estimate might be a result of several factors. Firstly, data was acquired on 16 of Oregon's 36 counties. Many of the counties for which data was unavailable were those receiving proportionally large timber payments. Part of the reason for this was different reporting and auditing standards across counties. A second factor

might be due to the fact that counties have different reserve fund categories. Reserve data obtained was strictly general reserves. However, several counties have other reserve funds as well. Finally, counties may have been able to generate revenues from other sources during the phase out period such as government grants.

VI. *Analysis*

The results for the base expenditure models revealed that the phase-out of the timber payments has yet to have any systematic effect on county's expenditure budgets. Yet, data would suggest that counties such as Curry, Douglas and Josephine rely heavily on these payments with the SRS receipts representing approximately 40, 38 and 26 percent of these local governments' expenditure budgets respectively¹. As such, counties are using a mechanism to account for this decrease in revenue streams. Our second investigation points out that both the BLM and Forest Service payments have a statistically significant effect on reserves. This implies that local Oregon governments have adjusted to the decrease in the payments by making use of their reserves. In fact, counties such as Lane have rerouted some of the earlier payments during the phase-out period to its reserve funds while simultaneously making use of these reserves in the fiscal year 2011-2012 (Lane County Finance Department).

In order for Oregon counties to maintain expenditures at required levels they must make use of their reserves to account for the timber payment loss. However, the nature of the reserve funds is that they are a finite resource. The majority of local government reserve funds typically need to be maintained at a certain threshold. For instance, in Lane County, the General Fund should maintain a reserve balance of at least 10% of General Fund operating revenues. The use of reserves is an appropriate short run response, but is unsustainable in the long run. This short

¹Typically, it would make more sense to take these payments as a percent of counties' revenues. However, total expenditure budgets are typically similar in gross amounts as compared to total revenue budgets.

run analysis revealed that expenditure accounts have yet to be impacted by the phase out of the timber payments nor resulting from the use of reserves.

With respect our original hypotheses, the results reveal that the local governments in Oregon did not choose to begin adjusting their budgets as payments decreased. This might be because local governments believed that the payments would not be allowed to expire, but would instead be extended as they have in the past, and therefore chose to use reserve funds in the interim. This result is analogous to Rodden (2005), which found that local governments with rational bailout expectations are slower to adjust to negative revenue shocks. County governments may have believed that there would be a renewal of these timber payments or other compensating revenue sources in the future.

The other possibility is that reserve funds were drawn irrespective of the belief that the payments would be extended. The county governments in this scenario made a decision to hold expenditures constant for as long as possible until no longer possible. This could be because of differences in discounting or because changes in the government would leave future decision makers to adjust.

The following section is concerned with developing a long run approach to tackling the timber payment reductions using a model for property taxes.

LONG RUN ANALYSIS

Statistical Relevance of Timber Payments on Property Tax Rates

Our results show that the phase out of timber payments has led Oregon counties to make short run adjustments by making use of their reserves. As the previous section illustrates, as well as local government official insider knowledge, several counties could be at risk of breaching

critical reserve requirements during the upcoming 2011 - 2012 fiscal reporting period. Given what seems to be an exhausted selection of solutions, this section is dedicated to analyzing the timber payments in a long run framework. This is done by incorporating the payments in an explanatory regression of property tax rates. The purpose of this model is to provide an approximate coefficient estimate of the timber payments impact on property tax rates thus providing a statistical and tangible relationship between the two forms of revenue streams for the counties. This long run regression assumes that county governments do not face any of the restrictions on their ability to increase property tax rates. However, referenda such as measures 5 and 50 impose limitations on the ability of local governments to increase property taxes and thus constrain their long run decision making.

The US government owns expansive forest lands throughout Oregon which is not taxable at the local level. Local counties cannot tax federal lands located within their jurisdiction. It is for this reason that timber revenues have been shared with the counties in which they were generated for decades. It was a compensation for the taxes that could not be collected. However, if the compensation to the counties was at a level whereby the counties were receiving exactly the amount of revenue they would be if the government was not the owner, it is not unreasonable to think that property tax rates on the rest of the residents would not be affected by this compensation. If the timber levels perfectly compensated the counties, the counties would still have set tax rates for the rest of their citizens at the level necessary to provide all necessary services for the residents. Federal lands need some services, but they do not need nearly the level of services a populated area would require. Therefore, if these payments to counties were to expire, property tax rates would still be near the level necessary to continue providing all county services. This section investigates whether the timber payments allowed counties to

systematically set lower property tax rates than they otherwise would have been able to, and if so, to what extent.

I. *Literature Review*

The literature on local property tax rates is already well developed. There are many studies on how property tax rates are determined and what effects they have on the community. There is a particularly broad literature on the relationship between property tax rates and property values. Also, there have been studies previously conducted on the impact federal funds have on local government budgets. Below are three studies we found to be the most relevant.

A study by Gramlich and Galper (1973) looked at the effects of federal grants on local government budgetary tendencies. The areas of inquiry included expenditures and the growth of budget surpluses at the state and local level. Among other things, the study looked to capture the effect of lump sum grants on local government expenditures and found that federal funds that are to be spent at the local government's discretion have a positive impact on expenditures. The paper estimates for each dollar in federal monies, expenditures will rise between \$0.25 and \$0.43. While a grant does not raise expenditures by an equal amount, according to this paper, it certainly raises local expenditures.

Perhaps more relevant to our current analysis is a study of Spanish governments. Esteller-More, et al. (2003), found that increases in grants from the central government resulted in higher expenditures, as well as lower tax rates, at the local level. There may be a similar effect within Oregon, as some of the counties long dependent on timber receipts and Secure Rural Schools funds have property tax rates substantially lower than those found in counties that have ever only

received a fraction of the payments. Below, Table 2-1 displays the share of expenditures SRS payments represent and the property tax rate per \$1,000 of net assessed value for each county.

Table 2-1 (2004 Data)

COUNTY	Share of Exp	TaxRatesNAV (per \$1000)
Clatsop	0.0%	12.48
Gilliam	0.0%	12.84
Sherman	0.0%	17.05
Malheur	0.1%	12.62
Washington	0.2%	15.68
Multnomah	0.3%	19.88
Umatilla	2.4%	15.52
Morrow	2.6%	16.51
Marion	3.1%	16.61
Deschutes	4.0%	14.41
Clackamas	4.7%	15.12
Jefferson	5.5%	16.66
Columbia	6.1%	12.88
Union	7.6%	13.68
Baker	9.9%	13.53
Tillamook	10.4%	10.31
Benton	10.6%	15.23
Average		14.77
Lincoln	13.9%	13.45
Hood River	15.0%	12.38
Jackson	17.1%	13.48
Crook	17.4%	13.99
Wasco	18.0%	16.56
Linn	20.0%	14.84
Wallowa	20.3%	13.17
Coos	20.5%	13.57
Wheeler	24.2%	16.62
Lane	24.2%	15.26
Josephine	25.1%	6.81
Klamath	35.5%	11
Harney	46.8%	13.77
Curry	48.1%	8.89
Douglas	49.1%	11.19

Lake	68.7%	14.11
Grant	73.5%	15.31
Average		13.2
Difference		1.57
Polk	N/A	N/A
Yamhill	N/A	N/A

Another study by Wallace Oates (1969) looked at cities in New Jersey. The study found that increases in property tax rates decreased property values. However, if public services are expanded as property tax rates rise, the effects may offset, resulting in no property value changes. The conclusion he draws from his results is that people will pay more for to live in a community with many public services. His findings further point out an intuitive relationship; people will pay more to live in a community offering the best services at the lowest tax rate. Higher tax rates result in lower property values. With respect to our paper’s analysis, if tax rates are set at the county level, counties will try to set them low, but high enough to provide the necessary services. This suggests that perhaps counties receiving SRS payments could provide more for less, which, according to Oates, could positively affect property values.

II. *Empirical Specifications*

The purpose of this section is to define the optimally adjusted equilibrium property tax by taking into account all revenue sources. Under an equilibrium scenario, timber payments are at a fixed and stable level and local county property taxes have been optimally set given these timber payments. Given this condition, the year 2004 is the most appropriate year to use for constructing our regression. This is because we can include data from before the phase out plan when counties were receiving some of the largest payments under the Secure Rural Schools Act.

With this in mind, we would assume that the shock in revenue streams resulting from the phase out plan would have an effect on the equilibrium property tax rate. Counties may need to adjust tax rates in the long-run in response to the loss of timber payments. The objective of the following empirical model is to estimate this equilibrium property tax rate in the context of the timber payments. The regression is organized with the county property tax rate as the dependent variable

$$\begin{aligned} \text{County Property Tax Rate} = & \alpha + \beta_1 \text{Population}_{2004} + \beta_2 \text{PopulationDensity}_{2004} + \beta_3 \text{County Per} \\ & \text{Capita Median Income}_{2004} + \beta_4 \text{Unemployment}_{2004} + \beta_5 \text{Total Forest Payments}_{2004} + \beta_6 \text{Obama}_{2004} \\ & + \varepsilon_{2004} \end{aligned}$$

We include the *Population* and *PopulationDensity* variables to account for demographic pressures on property tax rates and as proxies for such things as demand for property (affecting real market values) and total area of a county. For instance, counties with higher population and population density might face increased demand for property as well as for services offered by local government. *County per capita median income* is also used as a control group to account for additional outside influences that may cause disparities in the property tax rates as a result of income differences between counties. The same logic applies to the *unemployment* variable. The total forest payments variable is a combination of both the total BLM and Forest Services timber receipts and is the coefficient we wish to estimate. The *Obama* variable is used to capture to political tendency of counties, where we might predict that counties with either a Republican or Democrat majority might have an impact on the property tax rate and its future adjustments.

III. *Data Description*

With a relatively small number of Oregon counties, data on California and Washington State counties were included in the model. Both states also receive a share of the Forest Service payments, although not to the same degree. As such, the underlying assumption is that both states are similar to Oregon with respect to geography, as well as such factors as population, income, unemployment and political tendencies, which affect citizens' preferences regarding taxes and public services. The inclusion of California and Washington State counties increases our sample size and, thus, the accuracy of the model.

We used the net assessed value (NAV) of county property tax rates for all three states based on data available. In general, net assessed value is the property value that is taxed on and differs slightly from the real market value (RMV) of properties. We used the total property tax rate for the average resident of each county, which includes taxes paid to each level of government, not just county. This was the data available to us. As it is the average tax rate paid in total by each county resident, the impact of the Secure Rural Schools payments should still be apparent, as they would affect every county resident, on average. Property tax rate data for Oregon counties in 2004 was obtained from the Oregon property tax statistics for the fiscal year 2004-2005 from the Oregon Department of Revenue. Property tax rate data for Washington State counties in 2004 was obtained from the Department of Revenue of Washington State's tax statistics in 2004 while the property tax rate data for California was obtained from the California Board of Equalization. Similar to the short run analysis, the population data for all counties of all three states was obtained from the Census' Intercensal Estimates of the Resident Population for Counties while county area was also obtained from the Census' state and county QuickFacts. Median income statistics were obtained from the US Census Bureau's Small Area Income and

Poverty Estimates for all counties. County unemployment statistics were obtained from the Bureau of Labor Statistics (BLS) Local Area Unemployment (LAU) department. With respect to the political variable, we obtained election results by counties for 2008 strictly accounting for either Democratic (President Obama) or Republican (Senator McCain) votes. The assumption is that the political climate and composition in counties on the west coast experienced little change. The presidential election data for Oregon and Washington counties was obtained from the US Elections Atlas, while California election data was obtained from the California Secretary of State Vote Summaries section.

IV. *Estimation Results*

Table 2-2 (*P-Values are listed below the coefficient estimates in parentheses*)

Variables	General Property Taxes
Total Population	1.25e-07 (0.446)
Population Density	.0000497 (0.634)
Per Capita Income	4.94e-06 (0.821)
Unemployment Rate	.0034523 (0.970)
Percentage Vote for Obama	-.0042582 (0.583)
SRS Payments in Millions	-.1137568 (0.000)
Washington	-1.89811 (0.000)

California	-4.142866 (0.000)
R²	0.4864
Adjusted R²	0.4519
Observations	128

Table 2-2 lists the results of our regression model covering property tax rates for Oregon, California, and Washington counties in 2004. Interestingly, none of our control variables had a significant impact on property tax rates at any level. We expected there to be some correlation between these variables and tax rates. The coefficient estimate on our political variable (*percentage vote for Obama*) is negative, which is also contrary to our expectations. We expected votes for a democratic president to be correlated with a higher property tax rate.

However, the coefficient estimate on timber payments is highly significant. The model estimates that for each million dollars in SRS payments, property tax rates are approximately 11 cents lower per thousand dollars of net assessed value. This result is significant at every level.

The model we used seems to suggest that counties choose tax rates in a way that is fairly standard without much variation. Our results suggest that counties do not set tax rates based to a large degree on demographic concerns, but rather that there is a kind of standard tax rate. All of the coefficient estimates for the control variables in our regression are very small, most well below 1. They not only have little impact on property tax rates, but are also not statistically significant. In other words, they are not particularly accurate. However, the timber payments have a noticeable and systematic impact on property tax rates and can be summarized as such: the higher the SRS payment, the lower the property tax rate. This model also suggests that this tax rate is affected by outside revenue sources and the ability of counties to tax at the lowest possible level.

V. *Analysis*

Part of the reason behind the timber payments was to compensate for taxes that could not be collected on the federal forests². The coefficient estimate for Secure Rural Schools Payments would suggest that counties receiving a larger amount of timber payments as a proportion of their revenues and expenditures were able to set lower property taxes at a lower rate (a result implied in Table 2-1 in the literature review section). In fact Table 2-1 reveals that on average, half of the Oregon counties receiving the higher amount of timber receipts as a proportion of their expenditure budgets set their property taxes \$1.57 below the other half. This result is somewhat consistent with our regression. Table 2-3 below includes the results of the preferred levels of property tax levies which our model suggests given no property tax restrictions.

Table 2-3 (2004 data), with preferred property tax levels

COUNTY	Share of Exp	TaxRatesNAV	Preferred Levels
Clatsop	0.0%	12.48	12.48
Gilliam	0.0%	12.84	12.84
Sherman	0.0%	17.05	17.05
Malheur	0.1%	12.62	12.62
Washington	0.2%	15.68	15.76
Multnomah	0.3%	19.88	20.14
Umatilla	2.4%	15.52	15.63
Morrow	2.6%	16.51	16.55
Marion	3.1%	16.61	17.27
Deschutes	4.0%	14.41	14.94
Clackamas	4.7%	15.12	16.62
Jefferson	5.5%	16.66	16.76
Columbia	6.1%	12.88	13.14
Union	7.6%	13.68	13.80
Baker	9.9%	13.53	13.67
Tillamook	10.4%	10.31	10.69
Benton	10.6%	15.23	15.64
Average		14.76529412	

²For additional information on the background and purpose of the timber payments visit <http://www.blm.gov/or/rac/ctypayhistory.php>

Lincoln	13.9%	13.45	14.08
Hood River	15.0%	12.38	12.70
Jackson	17.1%	13.48	16.19
Crook	17.4%	13.99	14.40
Wasco	18.0%	16.56	16.89
Linn	20.0%	14.84	16.43
Wallowa	20.3%	13.17	13.33
Coos	20.5%	13.57	14.51
Wheeler	24.2%	16.62	16.75
Lane	24.2%	15.26	20.97
Josephine	25.1%	6.81	8.69
Klamath	35.5%	11	13.19
Harney	46.8%	13.77	14.24
Curry	48.1%	8.89	9.97
Douglas	49.1%	11.19	16.90
Lake	68.7%	14.11	14.74
Grant	73.5%	15.31	16.45
Average		13.2	
Polk	N/A	N/A	
Yamhill	N/A	N/A	

On average, the preferred level of property tax rates absent of restriction stands at an average of approximately \$14.90 per thousand dollars of net assessed value. This result is consistent with the results from the estimation in Table 2-2 that indicate that for every increase in \$1 million in timber payments, counties had set property tax rates by 11 cents lower per \$1000 of assessed value. Using Coos County as an example, which received \$8,238,961.95 in SRS payments, residents would pay \$0.91 less in property taxes ($.11 \times \$8,238,961.95 / \$1,000,000$) than they would have without the payments controlling for population, population density, median income and political tendencies (although these variables are not statistically significant). This number obtained from the optimal tax regression is similar to the average \$1.57 calculated in Table 2-1 for the half of Oregon counties receiving the highest timber receipts. These results

combined would suggest that certain Oregon counties received substantial, arguably generous, payments and lowered their property tax rates accordingly. However, given the phase-out of the Secure Rural Schools Act, maintaining expenditures at their current levels with these tax rates is unsustainable in the long run.

With unrestricted property tax adjustment, in equilibrium we could expect counties to increase property tax rates accordingly over time. However, property tax rates are not allowed to move without restrictions. As previously discussed, property tax restrictions such as measures 5 and 50 are currently in effect in Oregon and as similar ballots in California and Washington State. Therefore, our estimates of feasible tax rate changes must be considered accordingly. Our model suggests what property tax adjustments may be possible in equilibrium, but as a result of the restrictions, these adjustments are difficult to implement by local government. For example, measure 50 requires a double majority provision for any property tax legislation making it difficult to increase the property tax rates

CONCLUSION

The Secure Rural Schools Act payments have yet to systematically impact county expenditures. However, dwindling reserves coupled with low property tax rates are putting Oregon's local governments at risk of having to adjust expenditures. This paper first provided a short run analysis to this issue by investigating how counties have managed to maintain expenditures at their current levels through the use of reserves. As an evaluation, this is likely the most appropriate short run response, but is unsustainable in the long run. The second part of this paper investigated local property taxes rates in relation to federal payments. The results suggest

that counties receiving a relatively large share of their expenditure budgets from the SRS payments have on average lower property taxes than counties receiving smaller payments. We believe that the results from this study provide an accurate representation of the circumstances and environment faced by Oregon counties.

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APPENDIX 1 – Data Sources

Secure Rural Schools Payments Information:

Forest Service Payments to counties – US Forest Service. “Secure Rural Schools Payment Reports” < <http://www.fs.usda.gov/main/pts/securepayments/projectedpayments>>

Bureau of Land Management payments – Bureau of Land Management. “Official Payments Made to Counties”. < <http://www.blm.gov/or/rac/ctypaypayments.php>>

County Level Information:

County Annual Financial Reports – Oregon Secretary of State Audits Division. “Local Government Audit Report Search”. < <http://egov.sos.state.or.us/muni/public.do>>

Per capita income – Median Income Statistics by County. Small Area Income and Poverty Estimates. US Census Bureau. <<http://www.census.gov/cgi-bin/saibe/saibe.cgi>>

County unemployment statistics – BLS Local Area Unemployment (LAU) Statistics. “County Data, Labor force data by county, 2004 annual averages”. < <http://www.bls.gov/lau/>>

Population – Intercensal Estimates of the Resident Population for Counties: April 1, 2000 to July 1, 2010. US Census Bureau. <<http://www.census.gov/popest/data/intercensal/county/CO-EST00INT-01.html>>

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Election Results:

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