A Regional Assessment of Borough Government Finances And Employment

Prepared with support from
Northrim Bank
University of Alaska Strategic Investment Funds
GCI

By
Mouhcine Guettabi, Assistant Professor of Economics,
Institute of Social and Economic Research
University of Alaska Anchorage
3211 Providence Drive
Anchorage, Alaska 99508

June 2017

Random Reamey provided valuable research help.

Introduction

Alaska's state budget revenues declined by more than 90% from 2012 to 2016, mainly due to a sharp drop in oil prices: oil revenues have paid for most state government operations since the 1980s. This loss of so much revenue has led to a shortfall of billions of dollars in the state budget and a sluggish economy. The health of a state's tax revenues is critical to its economic growth and ability to finance public services. Considerable attention has been paid to the state's fiscal woes, which are still ongoing. But the state also provides considerable support to Alaska's local governments—and there has been little analysis of how the decline of state revenues might affect local governments.

This analysis reports how much Alaska's 19 borough governments rely on state aid—individually and as a group—and considers how vulnerable they are to cuts in state aid as time goes on. Alaska also has city governments, both within and outside organized boroughs, but here we look only at borough governments —which are essentially regional governments that, unlike cities, all have the same mandatory powers. We want to emphasize that our figures are estimates; boroughs report their revenues quite differently, and sometimes in ways that make it nearly impossible to identify allocations from the state.

Alaska provides three main kinds of aid to local governments: aid for general government operating expenses (revenue sharing), grants for public works projects, and aid for schools. It has mostly relied on its oil wealth to fund that aid to local governments. Revenue sharing helps ensure that all areas of the state can pay for basic public services and have reasonably equitable and stable local tax rates. Aid to schools is a major part of the state's budget, and it pays for a large share of school costs. State grants for local capital projects can vary sharply by year. In the years when oil prices were high—much of the time between 2008 and 2012—those grants were large. Since then, the state capital budget has shrunk to a small fraction of what it was a few years back.

Executive Summary

Below we first summarize the big picture of findings, and then report more details.

What Are the Main Findings?

• Boroughs depend much more on state dollars now than they did 10 years ago—the share of borough revenues coming from the state more than doubled between 2005 and 2015.

• If borough governments had to replace the state dollars they received in 2015 with local tax dollars, residents of different boroughs would have to pay anywhere from $250 to nearly $5,000 per person in additional taxes.

• While the state budget has declined precipitously, local government revenues have remained stable so far. In fact, in most places they have continued to grow—which is almost certainly temporary.

• That stability can't last, because the boroughs depend so much on state revenues—so it's only a matter of time before the state's fiscal crisis starts affecting the fiscal health of boroughs.

• Most of the variation in borough revenues from year to year results from changes in how much state money they receive. Among individual boroughs, the amount of variation in their revenues that can be explained by dollars coming from the state runs from almost zero to a high of 94%.

• Across boroughs, local government jobs and wages make up much different shares of total employment and wages. Local government jobs make up anywhere from 8% to 10% of all jobs in the larger urban

areas but as much as 60% in more remote places. Wages from local government jobs are anywhere from 11% to 78% of all wages among individual boroughs.

What Do Boroughs Look Like?

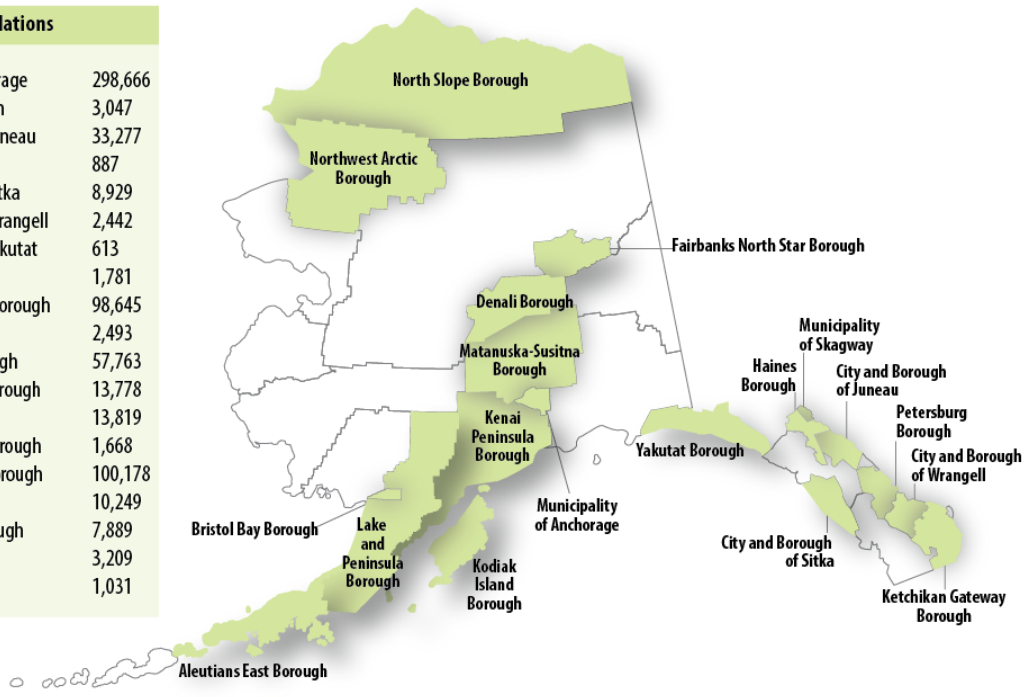
Map S-1 and Table S-1 provide the big picture of where organized boroughs are in Alaska, how many residents they have, and how many city government lie within and outside boroughs.

The organized boroughs are very different in their land areas and populations. Anchorage, with a population of about 300,000, covers around 2,000 square miles in Southcentral Alaska; the North Slope Borough, with about 10,000 residents, covers nearly 95,000 square miles. Skagway, in Southeast Alaska, is the smallest borough in both size and population, with just over 1,000 residents and an area of about 440 square miles. Large areas of western and interior Alaska have no organized boroughs—the areas in white on the map— and are known collectively as the unorganized borough.

There are several types of boroughs, depending on how they are organized. Four have unified city and borough governments; most but not all the others have city governments within their boundaries. Nearly 100 city governments are in areas without borough governments. A number of city governments inside and outside boroughs levy their own taxes.

Map S-1. Alaska's Organized Boroughs, 2017

Borough 2015 Populations	
Municipality of Anchorage	298,666
Aleutians East Borough	3,047
City and Borough of Juneau	33,277
Bristol Bay Borough	887
City and Borough of Sitka	8,929
City and Borough of Wrangell	2,442
City and Borough of Yakutat	613
Denali Borough	1,781
Fairbanks North Star Borough	98,645
Haines Borough	2,493
Kenai Peninsula Borough	57,763
Ketchikan Gateway Borough	13,778
Kodiak Island Borough	13,819
Lake and Peninsula Borough	1,668
Matanuska-Susitna Borough	100,178
North Slope	10,249
Northwest Arctic Borough	7,889
Petersburg	3,209
Skagway	1,031



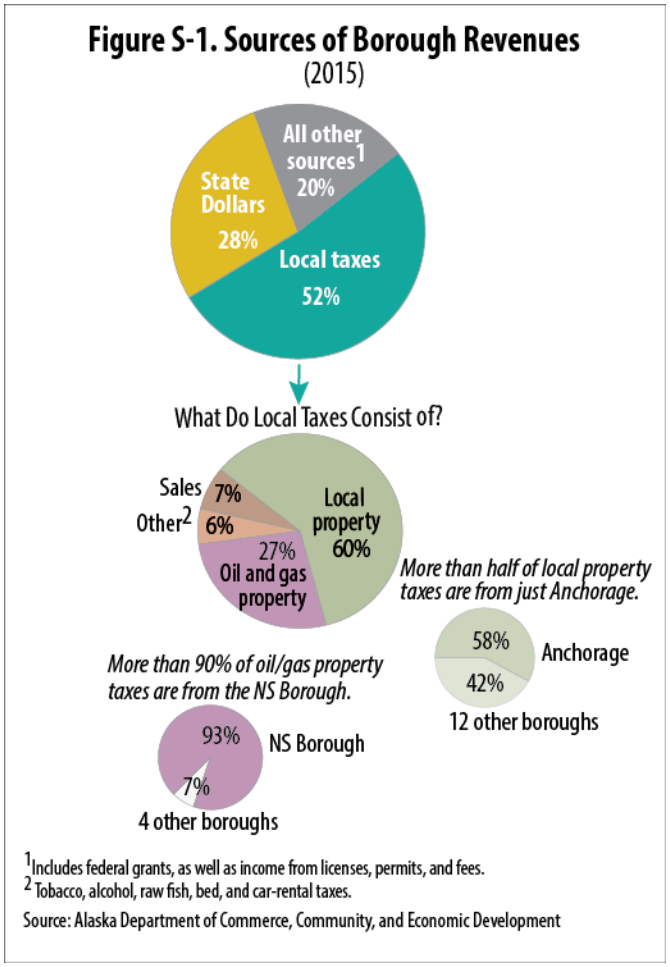
Source: Alaska Department of Labor and Workforce Development

Where Did Boroughs Get Their Revenues in 2015?

• *The average share of revenues boroughs got from the state in 2015 was 28%.* On average they raised 52% of their revenues from local taxes, and the remaining 20% came from federal dollars and miscellaneous other local fees (top pie, Figure S-1).

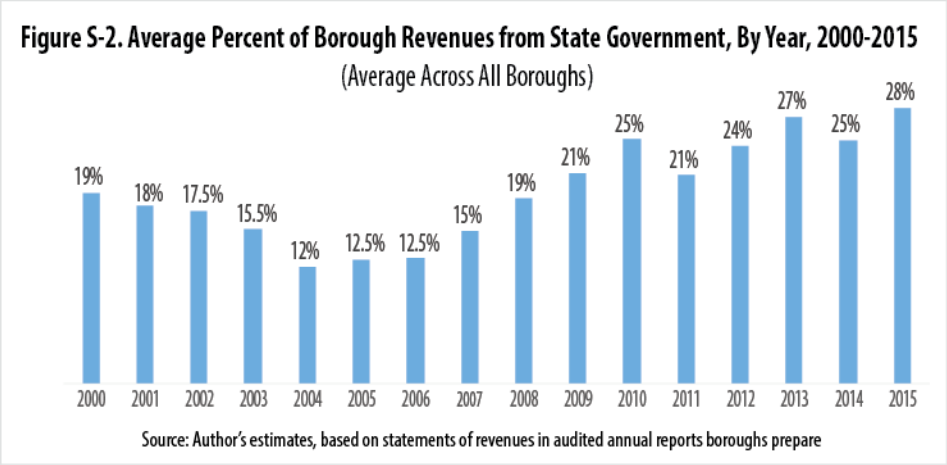
• *Taxes on local property made up 60% of all taxes boroughs collected in 2015, and taxes they collected on oil and gas property made up another 27%.* Sales taxes accounted for 7% of borough taxes, and the other 6% came from other types of taxes, including bed, tobacco, raw fish, and alcohol taxes. Not all boroughs collect all types of taxes; 13 have property taxes, 15 have bed taxes, 9 have sales taxes; 5 have tobacco taxes; and 2 have alcohol taxes.

• *The size of local tax bases varies sharply across boroughs*. Anchorage property taxes accounted for close to 60% of all local property taxes in 2015, and the North Slope Borough collected more than 90% of taxes on oil and gas property.

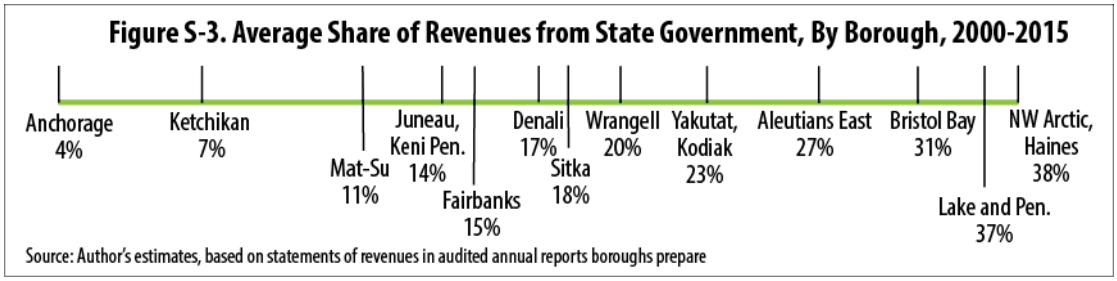


How Has Borough Dependence on State Dollars Changed Over Time?

• *Boroughs depended much more on state revenues in 2015 than in 2005*. Figure S-2 shows that across boroughs, the percentage of revenues from the state fell from 2000 through 2004—before the spike in oil prices—and then more than doubled, from about 12% in 2005 to 28% in 2015.



• *Some boroughs depend much more on state dollars than others do*. On average during the period from 2000 through 2015, the share of revenues from the state varied from as little as 4% in Anchorage—which has a far bigger local tax base than any other borough—to more than 35% in several boroughs with smaller tax bases.



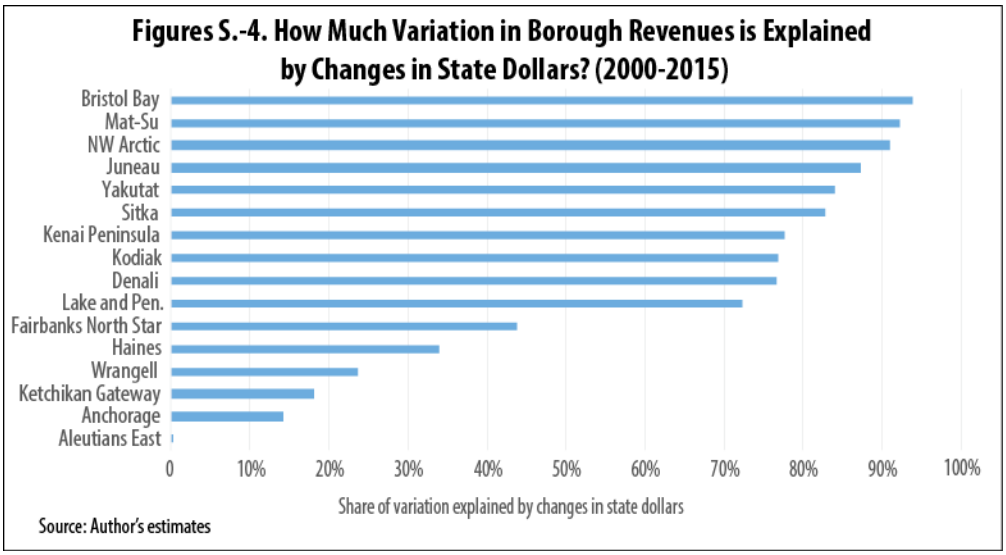
How Much Variation in Borough Revenues Can be Explained by Changes in State Dollars?

Over the past 15 years, overall revenues in individual boroughs have fluctuated significantly from year to year —and so have state revenues going to boroughs. We wanted to examine how much of that fluctuation in overall borough revenues can be explained by changes in the amount of state revenue they receive. Other factors—for instance, changes in the price of fish or numbers of tourists or federal dollars—can also affect how much revenue boroughs collect.

We specify simple parsimonious regressions (explained later in the report) that allow us to estimate how much of the revenue variation in individual boroughs from 2000-2015 was likely due to changes in state revenues. Figure S-4 shows the results. This is important, because it reminds us that any future declines in state dollars going to boroughs would be much harder on some than on others.

• *Changes in state revenues explain more than 90% of the variation* in overall revenues in the Bristol Bay, Mat-Su, and Northwest Arctic Boroughs.

• *By contrast, changes in state revenues account for less than 20% of the fluctuation* in overall revenues in Anchorage and the Ketchikan Gateway Borough. In other boroughs, changes in state revenues seem to be responsible for anywhere from about 25% to 87% of the variation in overall borough revenues.



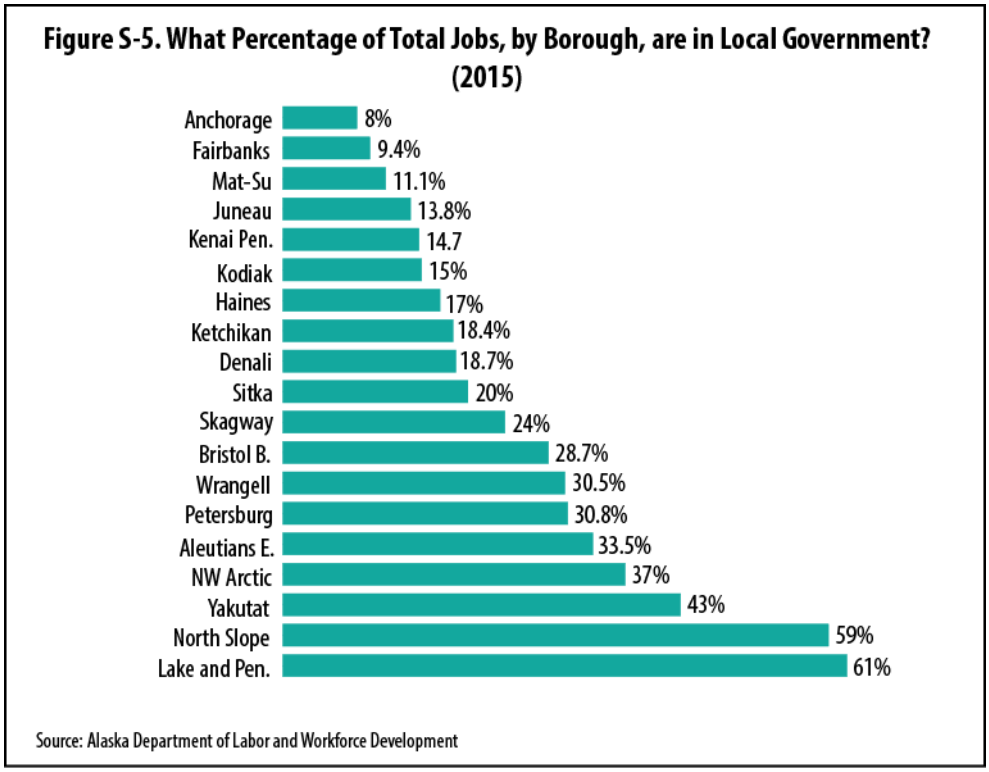
How Important are Local Government Jobs and Wages in Boroughs?

The percentage of total borough jobs that are in local government—and the share of borough wages that comes from those jobs—is another way of looking at how vulnerable individual borough economies might be, if state dollars that help support those jobs decline. Local employment includes not only borough employees, but also those who work for city governments or school districts in the boroughs.

• *Local government jobs made up anywhere from 8% to 10% of all jobs in the larger urban areas*— Anchorage, Mat-Su, Fairbanks— in 2015, but as much as 40% 60% in more remote places, including the Lake and Peninsula Borough, where private-sector jobs are often scarce.

• *Wages from local government jobs make up from 11% to 78%*[1] *of all wages* among the boroughs—again, the smaller shares are in areas with more jobs.

[1] These calculations used employment by place of residence which is smaller than employment by place of work. It has the advantage of focusing the analysis on people who work and reside in the communities we analyze.



How Much Would It Cost Boroughs To Replace State Dollars?

Table S-2 looks at the importance of state dollars to boroughs by estimating how much the boroughs would have to collect in additional taxes, if there were no state aid at all. We're not predicting that the state will eliminate aid—the state constitution requires the state to provide for public education. But the estimates do clearly illustrate how critical state dollars are to boroughs—and to borough taxpayers.

• *In Anchorage, where nearly half the state population lives, replacing dollars the municipality got in 2015 would require every resident—about 300,000—to pay an additional $250* in local taxes. In the other larger boroughs, additional tax bills would be from about $300 to $1,000 more person—depending on the level of state aid relative to the size of the population.

• In *smaller boroughs, with smaller populations, residents would be facing additional tax bills of several thousand dollars per person*—again, depending on the size of state aid relative to the population. Replacing state aid it received in 2015, Bristol Bay would need to collect nearly $5,000 more in taxes from every resident.

How Much Would Borough Governments Have to Collect to Replace State Aid?*			
Borough	**2015 state aid**	**Number of residents**	**Tax per person**
Municipality of Anchorage	$74,331,607	298,666	$248
Aleutians East Borough	$1,040,664	3,047	$342
City and Borough of Juneau	$36,574,789	33,277	$1,099
Bristol Bay Borough	$4,323,620	887	$4,874
City and Borough of Sitka	$15,088,635	8,929	$1,690
City and Borough of Wrangell	$2,819,638	2,442	$1,155
City and Borough of Yakutat	$1,321,017	613	$2,155
Denali Borough	$844,961	1,781	$474
Fairbanks North Star Borough	$27,470,931	98,645	$278
Haines Borough	$4,355,440	2,493	$1,747
Kenai Peninsula Borough	$21,704,735	57,763	$376
Ketchikan Gateway Borough	$4,154,678	13,778	$302
Kodiak Island Borough	$10,332,739	13,819	$748
Lake and Peninsula Borough	$3,300,079	1,668	$1,978
Matanuska-Susitna Borough	$33,277,044	100,178	$332
Northwest Arctic Borough	$17,892,275	7,889	$2,268

*We can't estimate figures for the North Slope, Petersburg, and Skagway boroughs because they do not report state dollars separately.
Source: Author's estimates, based on statements of revenues in audited reports prepared by boroughs and on population figures from the Alaska Department of Labor

A Regional Assessment of Borough Government Finances and Employment

Background

In this analysis we look only at finances of borough governments, but before we discuss our study methods and findings, here we describe Alaska's municipal government system. Alaska has two types of municipal government: organized cities and organized boroughs.[2]

Cities

A city government is a municipal corporation and political subdivision of the State of Alaska. City governments are subject to the "limitation of community" doctrine. (See Mobil Oil Corp. v. Local Boundary Commission, 518 P.2d 92, 100 (Alaska 1974).) The doctrine requires the area taken into the boundaries of a city to be urban or semi-urban.

Organized Boroughs

Like a city, an organized borough in Alaska is a municipal corporation and political subdivision of the State of Alaska. However, organized boroughs are regional governments—much larger than cities. The state constitution requires the state be divided into boroughs, either organized or unorganized. A borough is supposed to consist of an area and population that has common interests. Alaska has 19 organized boroughs and a single unorganized borough—consisting of all the areas outside organized boroughs. All organized boroughs have three mandatory powers: education, planning and land use regulation, and property assessment and taxation.

What Is the Difference Between a City and a Borough?

According to the Alaska Department of Commerce, a city generally exercises its powers within an established boundary that normally encompasses a single community, while a borough provides services and exercises power regionally. Under the state's constitution, a city is also part of the borough in which it is located. An organized borough may provide services on three levels. These are: areawide (throughout the borough), non-areawide (that part of the borough outside cities), and service areas (size and make-up vary). A borough also has the flexibility and capacity to provide services at the community level, typically through the creation of service areas. (State Constitution, Article X, Section 5)

What Kinds of Taxes Do the Boroughs Impose and How Important are They?[3]

Table 1 describes the taxes each Alaska borough[4] levied in 2015 and how much they collected. Those include property, sales, bed, raw fish, car rental, and alcohol taxes. Our goal in this table is to show the variety of and amounts of revenues each borough receives from taxes. This is just a partial picture of overall borough revenues, because it omits money they receive from investments, the federal government, and the state.[5] It's important to start out with the internal sources of revenues these boroughs rely on from

[2] Definitions of cities and borough are from the Alaska Department of commerce: https://www.commerce.alaska.gov/web/Portals/4/pub/2015%20%20LOCAL%20GOVERNMENT%20IN%20ALASKA.pdf

[3] We define internal sources as the taxes collected by the boroughs. They exclude investment income, fees, and other revenues.

[4] These sources exclude money coming from the state or federal government.

[5] We address the share of money coming from the state later in the text.

year to year, given that they have more control over them and are typically more stable than external revenue sources.

Aleutians East Borough had a population of 3,047 in 2015 and only one internal source of revenues—a fish tax that generated $3,998,104. That amounted to 35% of overall borough revenues. Bristol Bay has a bed tax, a personal and real property tax, and an alcohol tax, which generated 52% of its total 2015 revenues. Juneau has a tobacco tax, a bed tax, a sales tax, a real and personal property tax, and an alcohol tax, bringing in 63% of its overall 2015 revenues. Sitka has a tobacco tax, a bed tax, a sales tax that varies by season, a real and personal property tax, and a raw fix tax. In total, 39% of all Sitka's 2015 revenues come from those taxes. Wrangell has a bed tax, a sales tax, and a real property tax, accounting for 40% of all 2015 revenues. Yakutat has a bed tax, a sales tax, a property tax, and a car rental tax, bringing in about 37% for all the borough's revenues. Denali has only a bed tax, bringing in 71% of all its revenues. Fairbanks has a tobacco tax, a bed tax, a real property tax, and an alcohol tax. These sources made up 70% of all revenue for the borough in 2015. Haines has a bed tax, a sales tax, and a real property tax. These three taxes accounted for 50% of all the borough's revenues in 2015. Kenai Peninsula has a sales tax, and a real and a personal property tax. These taxes made up 77% of all the borough's 2015 revenues. Ketchikan Gateway has a bed tax, a sales tax, and a real property tax. These three taxes were responsible for 49% of the borough's 2015 revenues. Kodiak has a bed tax, a real and property tax, a raw fish tax, and a car rental tax. These generated about 54% of the borough's 2015 revenues. The Lake and Peninsula borough has a bed tax and raw fish tax, making up 28% of total borough revenues in 2015. The Mat-Su borough has a tobacco tax, a bed tax, and a real and a personal property tax, which generated half its 2015 revenues. The Northwest Arctic imposes no taxes, but does collect payment in lieu of taxes form the operators of the Red Dog zinc mine. Anchorage has a tobacco tax, a bed tax, a real and property tax, and a car rental tax, which brought in 69% of its 2015 revenues. The North Slope borough collects 82% of its local revenues from taxes on oil and gas property. Skagway has a bed tax, a sales tax that varies by season and a property tax, which generated 53% of its 2015 revenues. Petersburg has a bed tax, a sales tax, and a property tax, which brought in 46% of its 2016 revenues.

Overall, only two boroughs have alcohol taxes, five have tobacco taxes, fifteen have bed taxes, nine have sales tax, and thirteen have real property tax. The bed tax, and car rental tax are more likely to be borne by non-residents and therefore do not add to the tax burden to the year-round residents. Property taxes and sales taxes on the other hand do represent a reduction in income for the borough residents.

Table 1: Tax imposed by borough and their associated revenues (2015)[6]

Borough[7][8]	Tobacco Tax			Bed Tax		Sales Tax		Population	Rate(Mills)
	Revenue	Rate	Wholesale	Revenue	Rate	Revenue	Rate		
Anchorage	21,926,133		55%	24,936,211	12%			398,666	14.89
Aleutians East	-	-	-	-	-	-	-	3,047	-
Bristol Bay	-	-	-	$96,991	10%	-	-	887	13.00
Juneau	$1,845,856	$3/pack	45%	$1,062,249	7%	$44,210,114	5%	33,277	10.76
Sitka	$735,594	$1.231/cig	45%	$411,916	6%	$9,471,481	5% Oct - Mar 6% Apr - Sep	8,929	6.00
Skagway				$154,696	8%	7,067,794	3% Oct-March 5% April- Sept	1,039	8 mills
Wrangell	-	-	-	$44,502	6%	$2,681,436	7%	2,442	12.75
Yakutat	-	-	-	$122,562	8%	$986,253	5%	613	8.00
Denali	-	-	-	$3,318,321	7%	-	-	1,781	-
Fairbanks North Star	$1,470,899	8%	-	$1,746,676	8%	-	-	98,645	11.42
Haines	-	-	-	$109,808	4%	$2,805,204	5.5%	2,493	10.47
Kenai Peninsula	-	-	-	-	-	$30,040,682	3%	57,763	4.50
Ketchikan Gateway	-	-	-	$50,591	6%	$8,483,194	2.5%	13,778	5.00
Kodiak Island[9]	-	-	-	$101,595	5%	-	-	13,819	10.75
Lake and Peninsula	-	-	-	$203,579	6%	-	-	1,668	-
Matsu	$7,548,977	11.4%	-	$1,117,249	8%	-	-	100,178	9.98
Northwest Arctic	-	-	-	-	-	-	-	7,889	-
Petersburg				$61,530	4%	3,090,350	6.0%		
North Slope	-	-	-	-	-	-	-	10,420	18.50

[6] An excellent resource from which we draw most of our information can be found here: https://dcced.maps.arcgis.com/apps/MapJournal/index.html?appid=1646ce6303d94b65b9caa6b0149b53df

[8] We obtain information on the presence of real and property tax from : https://www.commerce.alaska.gov/dcra/DCRARepoExt/RepoPubs/Taxable/2016-AlaskaTaxableSupplement.pdf

[9] While the Kodiak Island Borough does not have a sales tax the City of Kodiak does have one.

Borough	Property Tax		Property Tax Revenue		Raw Fish Tax		Car Rental Tax		Alcohol Tax	
	Real	Personal	Local	Oil and Gas	Revenue	Rate	Revenue	Rate	Revenue	Rate
Anchorage	Yes	Yes	509,671,675	5,589,282			5,637,102	8%		
Aleutians East	No	No	-	-	3,998,104	2%	-	-	-	-
Bristol Bay	Yes	Yes	$4,196,650	-	$2,412,396	3%	-	-	-	-
Juneau	Yes	Yes	$47,205,860	-	-	-	-	-	$1,062,249	3%
Sitka	Yes	Yes	$6,194,986	-	$127,020	10$/fishbox	-	-	-	-
Skagway	Yes		$1,812,889							
Wrangell	Yes	No	$1,703,619	-	-	-	-	-	-	-
Yakutat	Yes	No	$364,617	-	1%	$28,689	$37,588	8%	-	-
Denali	No	No	-	-	-	-	-	-	-	-
Fairbanks North Star	Yes	No	$95,169,571	$11,971,257	-	-	-	-	$998,195	5%
Haines	Yes	No	$2,825,480	-	-	-	-	-	-	-
Kenai	Yes	Yes	$50,520,180	$11,558,662	-	-	-	-	-	-
Ketchikan Gateway	Yes	No	$8,427,766	-	-	-	-	-	-	-
Kodiak Island	Yes	Yes	$14,397,697	-	$1,550,706	1.075%	-	-	-	-
Lake and Peninsula	No	No	-	-	$1,655,163	2%	-	-	-	-
Matsu	Yes	Yes	$ 119,079,479	$189,861	-	-	-	-	-	-
Northwest Arctic	No	No	-	-	-	-	-	-	-	-
Petersburg	Yes		$ 3,144,058							
North Slope	Yes	Yes	$12,777,163	$373,349,990	-	-	-	-	-	-

In Table 2, we show total borough revenues in 2015, along with the amounts derived from broad-based and transient taxes.

Table 2: Share of revenues derived from internal sources in 2015			
	Internal sources	Total revenues	Share from internal sources
Anchorage	567,760,403	817,266,590	69%
Aleutians East	3,998,104	11,441,970	35%
Bristol Bay	6,706,037	12,981,345	52%
Borough of Juneau	95,386,328	152,290,557	63%
Borough of Sitka	16,940,997	42,939,071	39%
Borough of Skagway	9,041,379	16,881,249	53%
Borough of Wrangell	4,429,557	10,959,208	40%
Borough of Yakutat	1,511,020	4,089,189	37%
Denali	3,318,321	4,688,173	71%
Fairbanks North Star	111,356,598	158,657,292	70%
Haines	5,740,492	11,412,805	50%
Kenai Peninsula	92,119,524	118,905,916	77%
Ketchikan Gateway	16,961,551	34,463,118	49%
Kodiak Island	16,049,998	29,615,703	54%
Lake and Peninsula	1,858,742	6,729,323	28%
Matsu	127,935,566	254,828,556	50%
Northwest Arctic	9,301,954	35,012,972	26%
Petersburg	6,295,938	13,879,193	46%
North Slope	386,137,592	473,133,079	82%

How does Dependence on State Money Differ Across Boroughs?

As we explained earlier, all boroughs also get part of their revenues from the state government. There are, however, considerable differences in how much each depends on that state money. Table 3 shows the average share each borough received from the state between 2000 and 2015. The boroughs with the lowest average share across those years were Anchorage, Kodiak, and the Mat-Su. Haines, Northwest Arctic[10], and Lake and Pen had the highest average shares. Another point the table shows is the large differences between the minimum and maximum state revenues boroughs received during that period. It is, however, important to be cautious in making these comparisons across boroughs, because the definitions of money coming from the state are not consistent across places. Some boroughs have considerable dollars classified as "intergovernmental," without specifying whether they are state or federal (see appendix).

Table 3: Average borough revenues and amounts received from the state between 2000 and 2015					
Borough[11]	Average		State Revenues		Average Share of Revenues Coming From State
	Revenues	State Revenues	Minimum	Maximum	
Anchorage	630,203,358	26,260,435	12,075,621	74,331,607	4.17%
Aleutians East Borough	$13,632,996	$3,667,517	$1,877,670	$6,910,724	26.90%
Borough of Juneau	$113,066,593	$15,449,555	$5,646,628	$36,574,789	13.66%
Bristol Bay Borough	$7,907,776	$2,441,132	$996,056	$4,323,620	30.87%
Borough of Sitka	$29,599,741	$5,445,953	$1,855,173	$15,088,635	18.40%
Borough of Wrangell	$10,130,885	$1,979,182	$512,386	$4,513,773	19.54%
Borough of Yakutat	$3,724,866	$847,846	$166,784	$2,243,502	22.76%
Denali Borough	$3,454,797	$597,296	$128,137	$1,541,197	17.29%
Fairbanks North Star Borough	$126,430,890	$18,403,737	$3,164,217	$33,271,614	14.56%
Haines Borough	$9,754,010	$3,776,856	$913,279	$6,818,146	38.72%
Kenai Peninsula Borough	$92,346,094	$12,526,042	$4,032,895	$25,565,104	13.56%
Ketchikan Gateway Borough	$28,474,204	$2,010,568	$431,992	$4,154,678	7.06%
Kodiak Island Borough	$23,114,521	$5,423,061	$2,086,628	$12,938,158	23.46%
Lake and Peninsula Borough	$5,089,425	$1,897,743	$828,064	$3,875,680	37.29%
Matanuska-Susitna Borough	$145,982,605	$16,564,326	$7,504,693	$33,277,044	11.35%
North Slope Borough	341,492,795	----------	----------	----------	
Northwest Arctic Borough	$19,215,264	$7,318,801	$319,643	$18,724,854	38.09%
Skagway	11,603,940	----------	----------	----------	
Petersburg Borough					

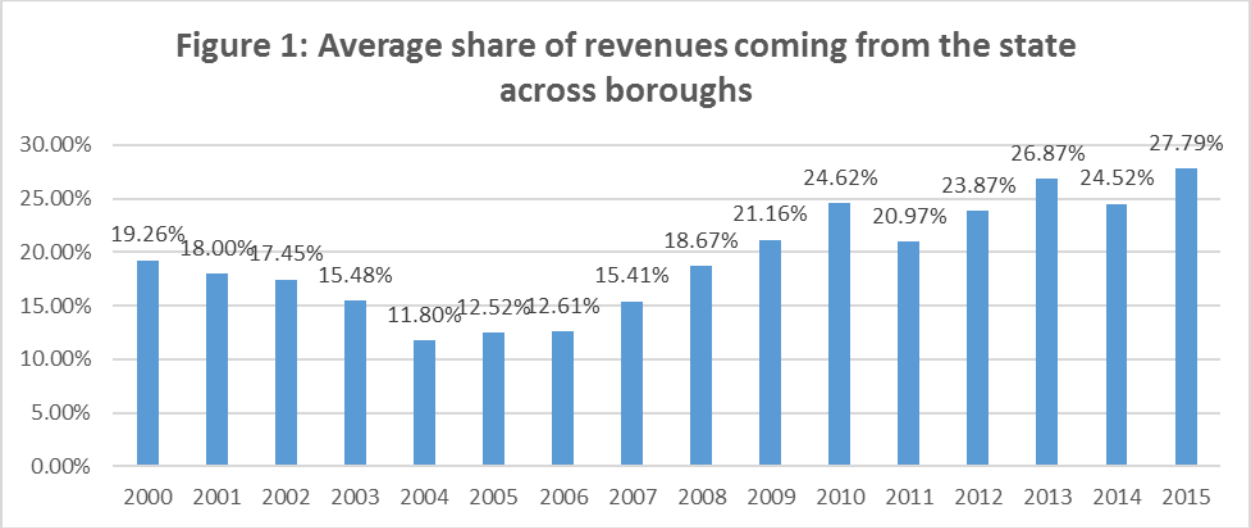
[11] As in a few of the other tables below, we are unable to separate state revenues for the North Slope, Skagway, and Petersburg, as all three combine federal/state dollars under a category classified as intergovernmental.

How Has the Importance of State Revenues Changed Over Time?

To further explore borough dependence on state revenues, Table 4 looks at the yearly shares of revenue coming from the state for each borough from 2000 to 2015. It shows those shares are very different across boroughs over that entire period, but also that in general the state share of revenues declined steadily from 2000 to 2004 in most boroughs, only to rebound and then continue increasing in later years.

Figure 1 groups all the boroughs and shows that the average share of revenues coming from the state across boroughs bottomed out at 12% in 2004 and was at 28% by 2015. This level of reliance on state revenues is much higher than what it was in 2000. As we pointed out earlier, the sharp decline in the state's revenues in the past few years means that the amount of money flowing to these areas will more than likely decline in the next few years. This, in essence, tells us that the boroughs will either need to replace a portion of these revenues through taxes, or reduce the services they provide their citizens.

	Table 4: Share of borough revenues coming from the state by year															
Borough	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Anchorage	5.66%	6.82%	7.59%	4.74%	2.54%	3.03%	2.64%	2.73%	2.74%	4.64%	3.21%	3.00%	3.53%	3.28%	3.08%	9.10%
Aleutians East Borough	41.17%	36.96%	21.07%	22.80%	18.19%	10.63%	10.90%	22.41%	30.57%	40.40%	48.47%	23.29%	28.99%	32.72%	27.48%	33.17%
Borough of Juneau	10.67%	7.04%	7.57%	8.86%	6.73%	6.55%	7.94%	10.85%	13.14%	17.10%	17.65%	15.39%	15.91%	16.40%	17.17%	24.02%
Bristol Bay Borough	30.35%	35.74%	28.73%	26.21%	21.63%	23.64%	22.44%	34.38%	35.24%	32.45%	29.89%	29.39%	35.74%	31.29%	30.63%	33.31%
Borough of Sitka	9.82%	10.77%	14.11%	14.33%	8.19%	10.68%	11.45%	11.66%	19.36%	24.71%	19.23%	15.61%	18.36%	25.74%	23.37%	35.14%
Borough of Wrangell	28.60%	21.90%	21.24%	25.61%	15.94%	16.90%	7.20%	7.45%	16.33%	19.14%	17.65%	36.71%	13.95%	16.99%	22.46%	25.73%
Borough of Yakutat	13.29%	13.11%	15.57%	18.36%	8.97%	8.30%	5.40%	10.07%	17.45%	29.10%	23.22%	20.78%	35.98%	34.49%	35.63%	32.31%
Denali Borough	5.94%	8.07%	7.51%	9.15%		11.79%	7.44%	8.35%	27.00%	18.22%	22.40%	18.14%	23.17%	31.67%	16.04%	18.02%
Fairbanks North Star Borough	15.17%	14.65%	13.76%	13.83%	13.16%	12.30%	12.05%	14.05%	14.10%	17.18%	14.61%	2.15%	14.21%	20.97%	20.22%	17.31%
Haines Borough	49.69%	45.66%	34.69%						10.14%	7.02%	48.47%	42.12%	42.69%	42.77%	31.03%	38.16%
Kenai Peninsula Borough	19.43%	13.66%	7.85%	7.83%	8.63%	5.36%	7.46%	10.27%	9.67%	11.60%	19.00%	11.22%	15.27%	21.08%	19.31%	18.25%
Ketchikan Gateway Borough		14.42%	14.18%	3.68%	2.18%	1.85%	2.51%	6.79%	4.27%	5.12%	5.26%	6.60%	8.39%	10.23%	9.45%	12.06%
Kodiak Island Borough	12.32%	12.70%	13.56%	12.78%	15.10%	11.63%	16.77%	18.56%	18.75%	24.61%	37.96%	28.14%	21.29%	30.92%	40.04%	34.89%
Lake and Peninsula Borough	26.10%	30.48%	42.97%	32.10%	23.37%	26.16%	34.30%	29.90%	41.84%	44.13%	32.34%	38.79%	59.13%	35.39%	32.44%	49.04%
Matanuska-Susitna Borough	11.81%	12.32%	11.95%	10.12%	8.73%	8.65%	8.97%	11.90%	10.92%	10.55%	10.68%	10.31%	12.82%	14.27%	10.93%	13.06%
North Slope Borough																
Northwest Arctic Borough	8.82%	3.68%	16.91%	21.85%		30.28%	31.72%	31.72%	27.19%	32.57%	43.84%	33.85%	32.53%	61.74%	53.01%	51.10%
Skagway																
Petersburg Borough																



What If Boroughs Had to Replace State Money: A Thought Experiment

To get an idea of the potential scale of the problem for boroughs as state aid declines, Table 5 shows the tax amounts each borough would need to collect from its residents to replace all 2015 state aid. The taxes would range from a low of $248 per person in Anchorage to a high of $4,847 in Bristol Bay. This is an extreme example—state aid is not all going to disappear—but it allows us to see the scale of the problem and the potential difficulties boroughs may face as they grapple with state revenue declines.

Table 5: Tax dollars necessary per person to replace dollars coming from the state in 2015

Borough name	State dollars	Number of residents	Tax amount per person
Anchorage	74,331,607	298,666	248
Aleutians East Borough	1,040,664	3,047	342
Borough of Juneau	36,574,789	33,277	1,099
Bristol Bay Borough	4,323,620	887	4,874
Borough of Sitka	15,088,635	8,929	1,690
Borough of Wrangell	2,819,638	2,442	1,155
Borough of Yakutat	1,321,017	613	2,155
Denali Borough	844,961	1,781	474
Fairbanks North Star Borough	27,470,931	98,645	278
Haines Borough	4,355,440	2,493	1,747
Kenai Peninsula Borough	21,704,735	57,763	376
Ketchikan Gateway Borough	4,154,678	13,778	302
Kodiak Island Borough	10,332,739	13,819	748
Lake and Peninsula Borough	3,300,079	1,668	1,978
Matanuska-Susitna Borough	33,277,044	100,178	332
North Slope Borough		10,420	
Northwest Arctic Borough	17,892,275	7,889	2,268
Skagway		1,039	
Petersburg Borough			

How Volatile are Local Government Revenues?

The fluctuation in the share of revenues coming from the state (shown in Table 4) highlights the volatility of borough revenues. To compare overall revenue fluctuations across places, below we show coefficients of variation,[12] which are calculated as the standard deviation over the mean by borough. These coefficients (Figure 2) allow us to compare volatility across boroughs. Table 6 ranks the boroughs, from the least to the most volatile.

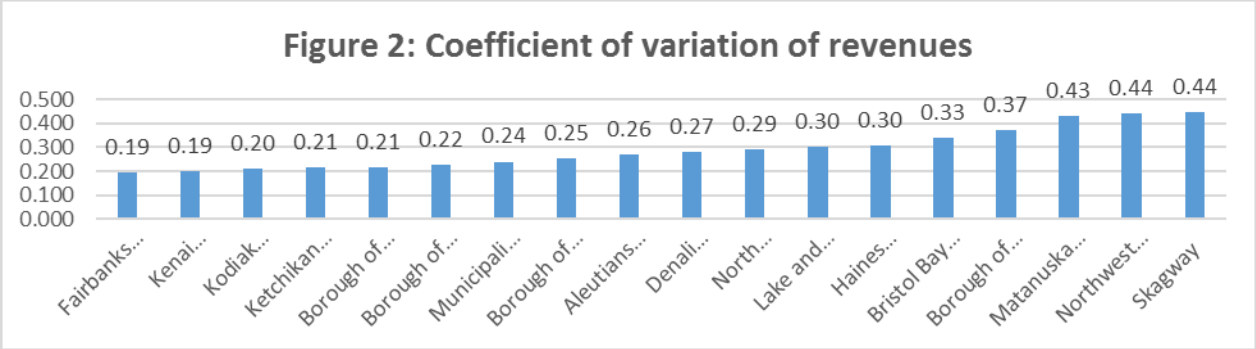


Table 6: Volatility of revenues by borough between 2000 and 2015

Boroughs	Coefficient of variation	Rank
Fairbanks North Star Borough	0.196	1
Kenai Peninsula Borough	0.199	2
Kodiak Island Borough	0.209	3
Ketchikan Gateway Borough	0.214	4
Borough of Juneau	0.217	5
Borough of Sitka	0.226	6
Municipality of Anchorage	0.240	7
Borough of Wrangell	0.253	8
Aleutians East Borough	0.268	9
Denali Borough	0.279	10
North Slope Borough	0.291	11
Lake and Peninsula Borough	0.302	12
Haines Borough	0.307	13
Bristol Bay Borough	0.338	14
Borough of Yakutat	0.371	15
Matanuska-Susitna Borough	0.431	16
Northwest Arctic Borough	0.441	17
Skagway	0.448	18

[12] We are unable to calculate a coefficient for Petersburg.

Fairbanks had the least volatile revenues between 2000 and 2015, while the Northwest Arctic Borough had the most. This volatility—subject to changing rapidly and unpredictably—is related to the sources of revenues and the amount by which they change from year to year. Fairbanks, for example, received 70% of its revenues from taxes in 2015, and those taxes are much more stable that state dollars. The boroughs with the second and third most stable revenues from year to year are the Kenai Peninsula, which gets 77% of its revenues from local taxes, and Kodiak, which gets 54%. The three boroughs with the most volatile revenues are Skagway, the Northwest Arctic, and the Mat-Su. To be clear, volatility can also stem from growth in revenues and is not necessarily negative. It simply shows large changes over the period. The evidence above seems to suggest that the level of reliance on state dollars is responsible for much of the year-to-year variation in revenues. Boroughs that get a sizable share of their revenues from internal sources tend to have more stable revenues. Property tax revenues, for example, tend to be very stable, since property values do not fluctuate wildly from year to year.

How Much of the Variation in Borough Revenues do State Dollars Explain?

The next step, then, is to examine how much of the variation in a borough's revenues can be explained by the amount of money it receives from the state. To do that, below we plot below the R^2 from a regression of borough revenues on state dollars received by that borough. That tells us the percentage of local revenues variation that is explained by a linear model.

R-squared = Explained variation / Total variation

It basically tells us that an R^2=.15, means that 15% of the variation in our response variable (borough revenues) can be explained a linear relationship with the predictor (amount money coming from the state). We estimated these regressions separately for each borough. Figure 3 shows the results.

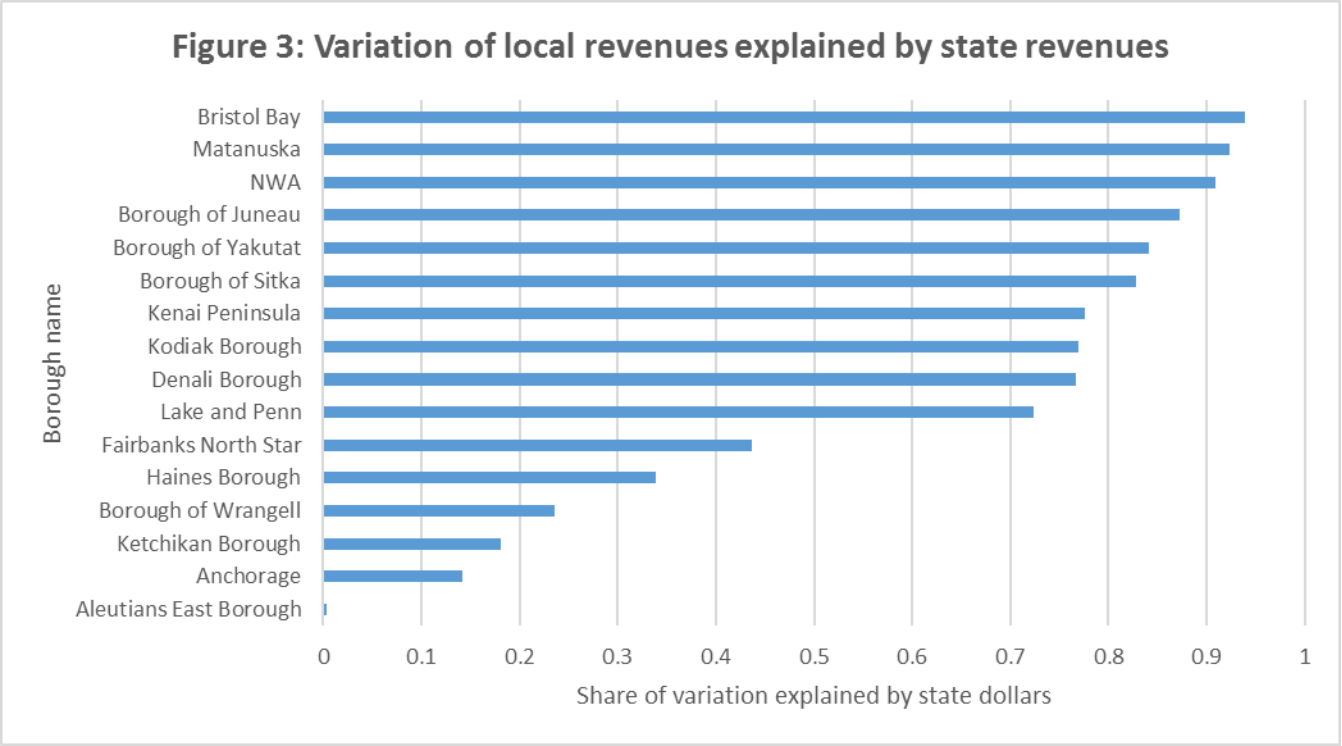


Table 7 shows that across the boroughs, the amount of variation of local revenues than can be explained by dollars coming from the state runs from a low of 14% for Anchorage to a high of 93% for Bristol Bay.[13] In general, this tells us that state dollars are a very important predictor of the variation of borough revenues across the board. It also tells us that some boroughs are much more sensitive than others to changes in state revenues—meaning that future declines in state aid could have vastly different consequences for different boroughs.

Table 7: Variation

Borough name[14]	Variation	Rank
Aleutians East Borough	0.003	1
Anchorage	0.142	2
Ketchikan Borough	0.181	3
Borough of Wrangell	0.236	4
Haines Borough	0.339	5
Fairbanks North Star	0.437	6
Lake and Penn	0.724	7
Denali Borough	0.767	8
Kodiak Borough	0.769	9
Kenai Peninsula	0.776	10
Borough of Sitka	0.828	11
Borough of Yakutat	0.841	12
Borough of Juneau	0.873	13
NWA	0.909	14
Matanuska	0.923	15

[13] State dollars do not explain any variation in Aleutians total revenues. This is mainly due to large fluctuations in federal government dollars, and investment income.

[14] We cannot calculate the variation of local revenues explained by state revenues for the North Slope, Skagway, and Petersburg. These three boroughs report intergovernmental revenues—including both state and federal dollars—that we cannot separate.

Bristol Bay	0.939	16

How Responsive are Borough Revenues to State Revenue Fluctuations?

Because how different boroughs are affected by a common statewide recession is of interest, a particular type of expected or "counterfactual" reaction suggests itself: namely, the resistance of the statewide revenues as a whole. In other words, the expectation is that, other things being equal, each borough's revenues would contract (in recessions) at the same rate as the state's. Thus, the expected change in revenues in borough r during a recession, say of duration k periods, would be given as:

$$(\Delta R_r^{t+k}) = g_N^{t+k} R_r^t \qquad (1)$$

Where g_N^{t+k} is the rate of contraction (in recession) of state revenues; and
R_r^t are revenues in region r in starting time t, the base year, that is, the turning point into recession. Then a measure of regional resistance can be expressed as:

$$(1) \quad Resist_r = \frac{\left\{\left(\Delta R_r^{Contraction}\right) - \left(\Delta R_r^{Contraction(expected)}\right)\right\}}{\left(\Delta R_r^{Contraction(expected)}\right)}$$

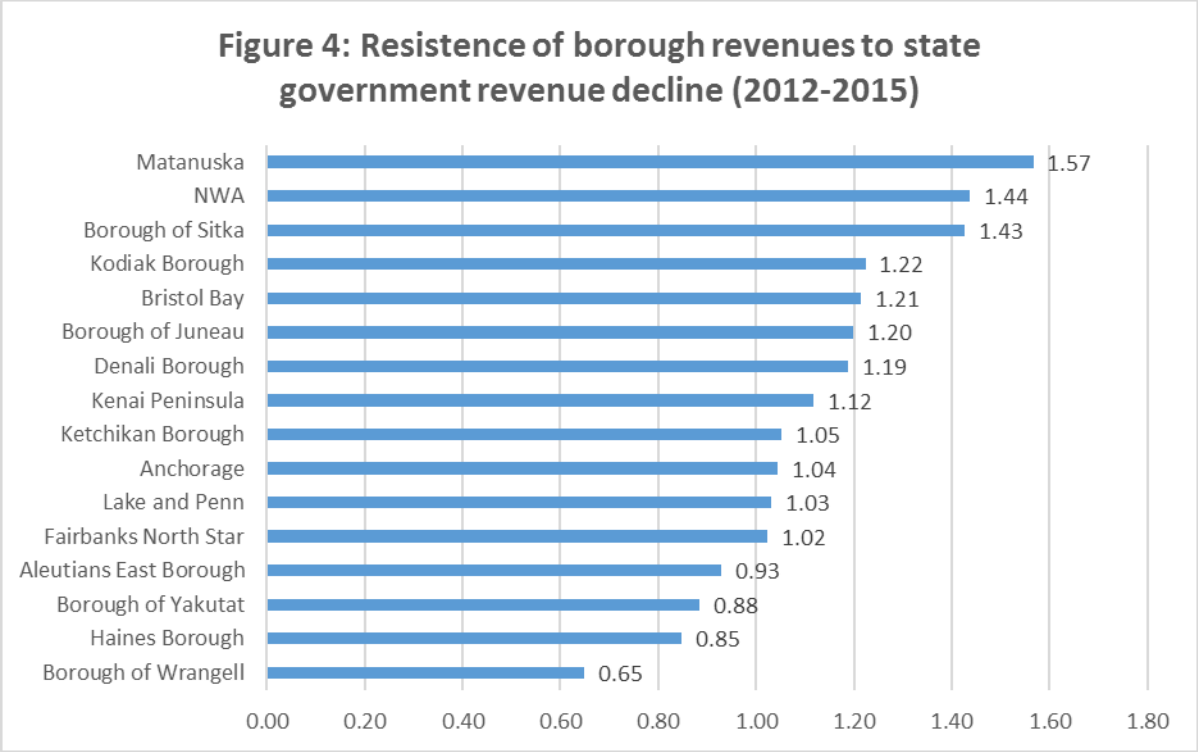
Where:

$\left(\Delta R_r^{Contraction(expected)}\right)$ is the expected contraction using equation 1.

$\left(\Delta R_r^{Contraction}\right)$ is the actual contraction at the borough level

A positive value of $Resist_r$ indicates that a region is more resistant to recession (that is, less affected) than the state revenues, and less resistant (more affected) for a negative value. For example, a value of $Resist_r$ of, say, 0.5 would indicate that the borough revenues in question are 50% more resistant than the state revenues, and a value of −0.5 that its resistance is only half that of the nation.

We use the period between 2012 and 2015 for the purposes of this analysis, because in 2013 state revenues started declining and have continued to plummet since. Therefore, we are investigating how the borough revenues have responded to this precipitous decrease and whether the declines in the boroughs of interest were more or less pronounced than those of the state. Figure 4 makes it clear that revenues of all the boroughs we analyzed have been more resilient than state revenues. For example, the Mat-Su Borough has been 157% more resistant than the state during this period. The Mat-Su's overall revenues actually grew during this period, in large part due to dollars coming from the state and the federal government. Although all borough revenues have managed to remain robust thus far, that does not mean that they will be immune going forward. Additionally, it seems that there is variation across places in how well communities have fared. One reason for this temporary resistance is the lag between appropriations and cash hitting the street. This means many currently ongoing construction projects are a result of past allocations which are very unlikely to continue given the small state capital project.



What is the Relationship Between Employment and Government Revenues?

Figure 5 shows the share of employment in local government by borough—including employees of borough and city governments and school districts. This is yet another way of assessing the vulnerability of borough economies to future declines in revenues. As in all the analyses above, there is considerable variation among boroughs, with Anchorage being the least reliant on local government employment and the Lake and Peninsula Borough the most, with almost 61% of all borough jobs in local government.

Local governments employ a wide range of occupations requiring all levels and kinds of skills. Not surprisingly, teachers and their aides represent the single largest group—a third of all local government employment. Many of the other jobs are also tied to education, including janitors, crossing guards, counselors, cooks, and administrators. Some of the common local-government occupations not linked to education include laborers, police officers, office clerks, nurses, bookkeepers, water and sewage treatment plant operators, and firefighters.

To understand how much local government revenues influence local government employment, we estimated the average relationship between a borough's revenues and its local government employment and found that a 10% increase in borough revenues leads to a 8.3% percent increase in employment across all boroughs. The regression that establishes this relationship is as follows:

$$y_{it} = \beta_0 + \beta_1 X_{it} + \delta_t + \varepsilon_{it} \qquad (2)$$

Where:

y_{it} is the log value of a borough's local government employment

X_{it} is the log value of a borough's local government revenues

δ_t is a year fixed effect which accounts for shocks common across all areas of the state.

We also estimate another set of reduced-form equations showing the relationship between local government employment and borough revenues, one borough at a time (Table 8). Given that we have very few observations, these regressions do not include a year fixed effect. While these regressions likely omit other important variables that influence the independent effect of revenues on employment, they do provide us with a sense of how sensitive employment changes are to revenue fluctuations.

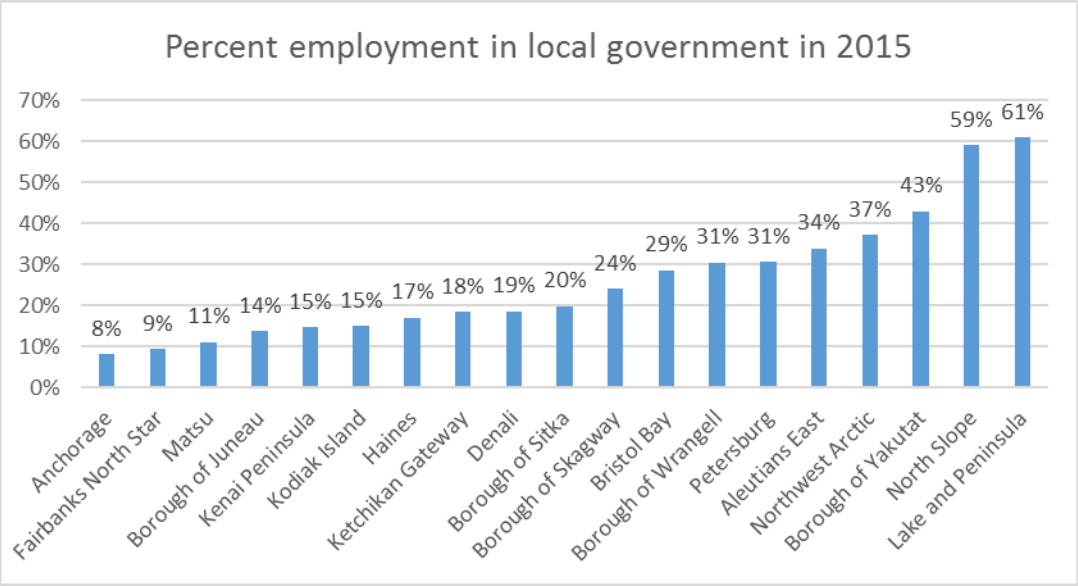


Table 8: effect of change in borough revenues on change in local government employment

	% change in local government employment for a 10% change in local government revenues	R^2
Aleutians East Borough	-.028 (.037)	0.04
Borough of Juneau	0.122*** (0.045)	0.36
Borough of Sitka	0.335*** (0.0476)	0.79

Bristol Bay Borough	-0.06 (0.41)	0.15
Denali Borough	0.02 (0.035)	0.04
Fairbanks North Star Borough	0.09** (0.039)	0.28
Haines Borough	0.151*** (0.044)	0.46
Kenai Peninsula Borough	0.012 (0.04)	0.004
Ketchikan Gateway Borough	0.08* (0.048)	0.18
Kodiak Island Borough	0.109* (0.064)	0.18
Lake and Peninsula Borough	0.088 (0.085)	0.07
Matanuska-Susitna Borough	0.303*** (0.027)	0.90
Municipality of Anchorage	0.035 (0.041)	0.05
North Slope Borough	0.008 (0.041)	0.003
Northwest Arctic Borough	-0.04 (0.025)	0.001
Wrangell, City and Borough of	0.10 (0.073)	0.12
Yakutat, City and Borough of	0.475** (0.130)	0.50

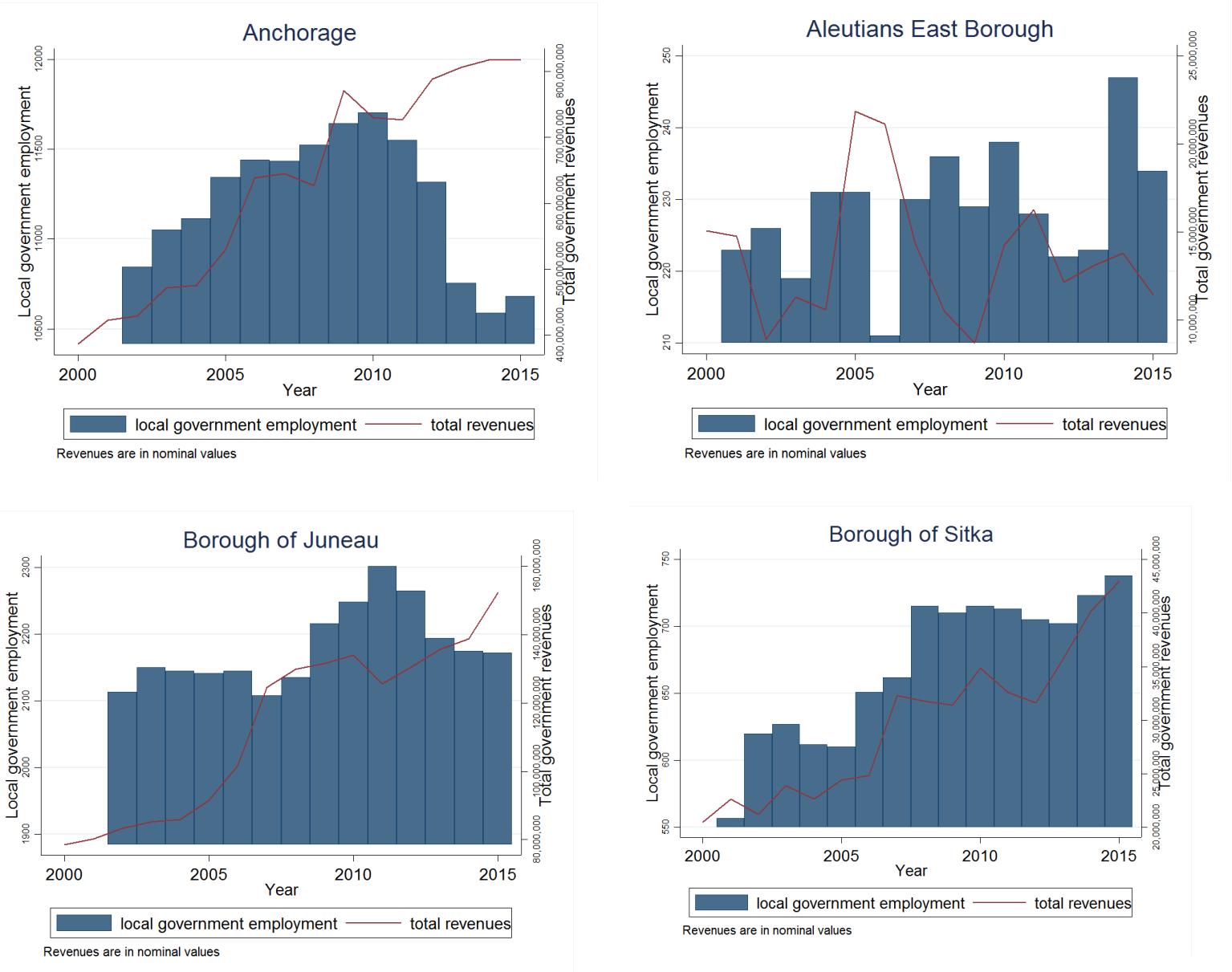
***, **,* represent statistical significance at 1, 5, and 10% levels.

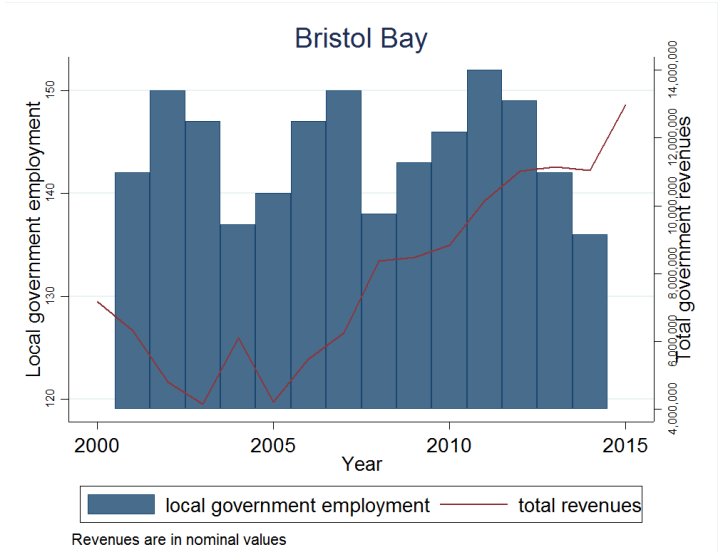
The relationship between changes in revenues and changes in employment are mostly in the expected direction: we see an increase in local government employment as a result of an increase in local revenues. Column 2 shows us the percent change in employment for a 10% change in revenues. For example, in Juneau, a 10% increase in revenues is associated with a 1.2% increase in employment. The third column

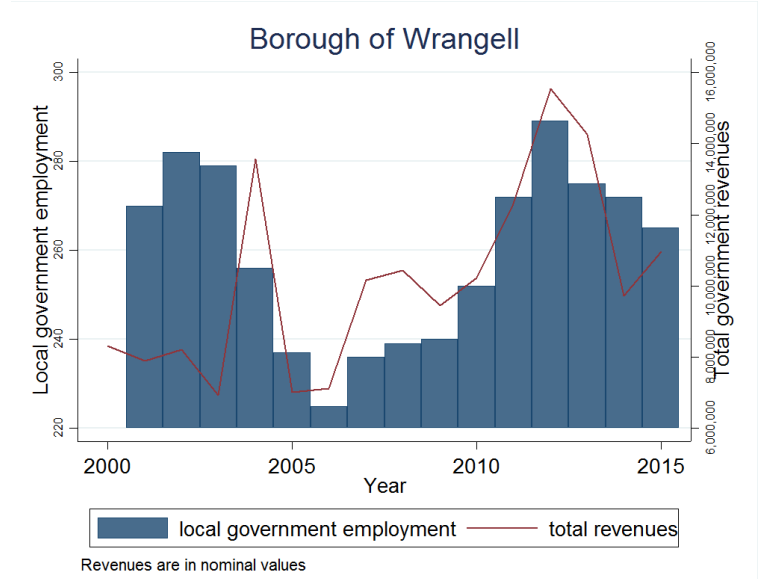
tells us the amount of variation in local government employment that can be explained by the borough's revenues.

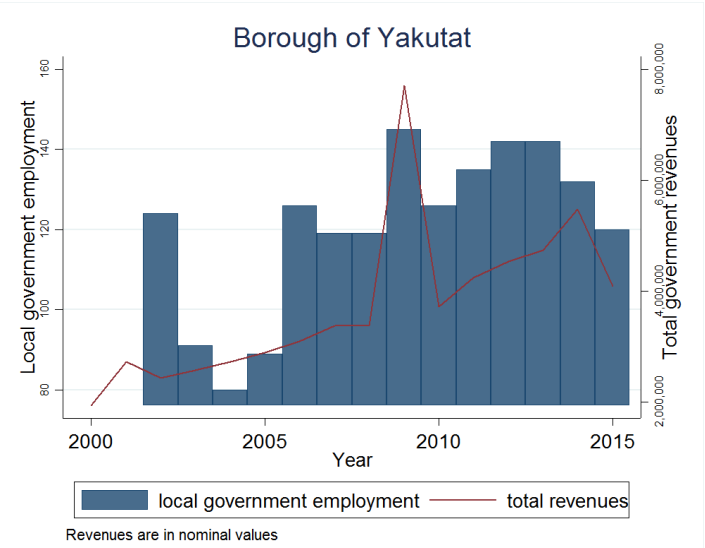
Figure 6 shows nominal local government revenues and local government employment for each borough separately. While once again the patterns differ, revenues have increased since the mid-2000s and employment has either increased or remained stable in most places.

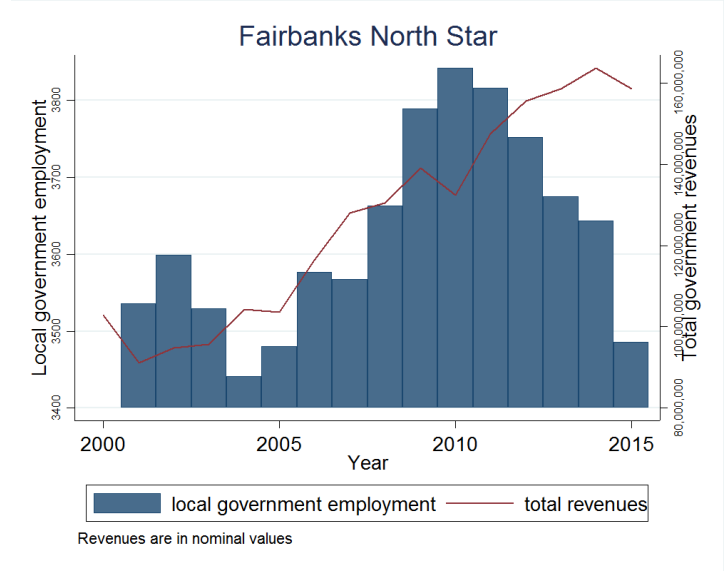
Figure 6: Local government employment and revenues by borough between 2000 and 2015

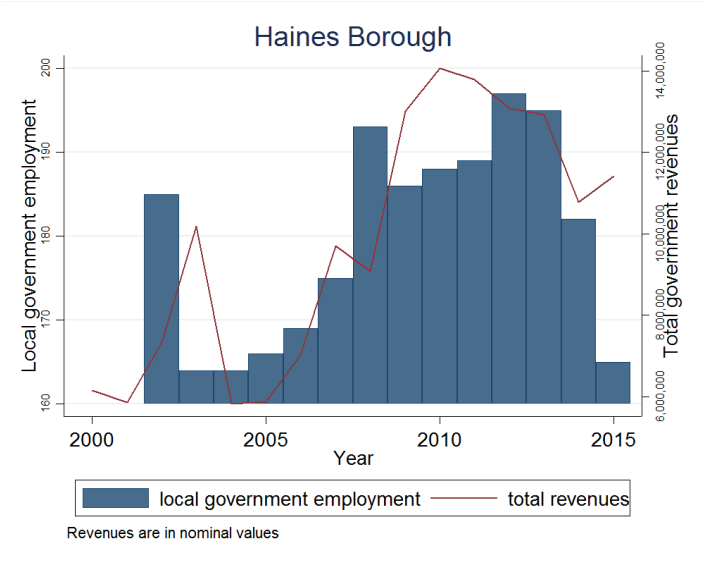


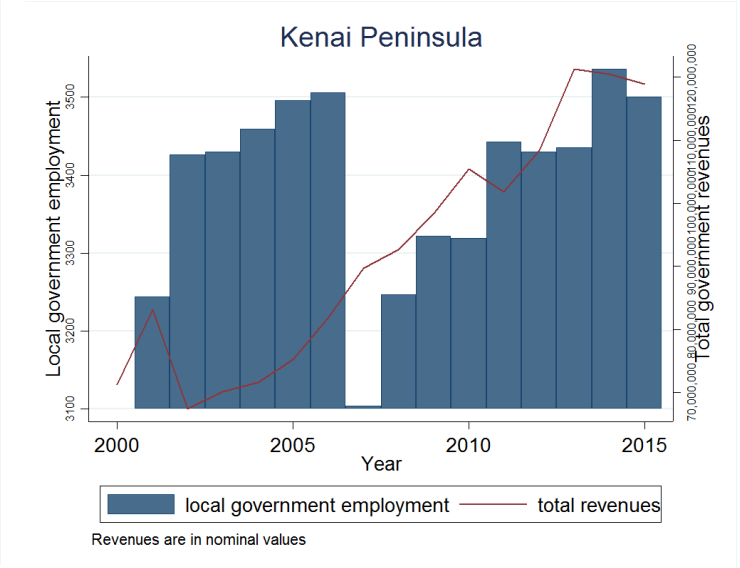

Bristol Bay
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values

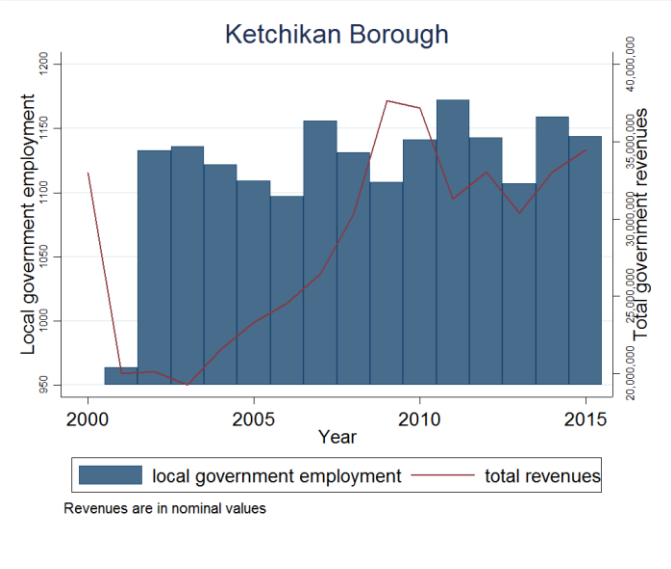

Borough of Wrangell
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values

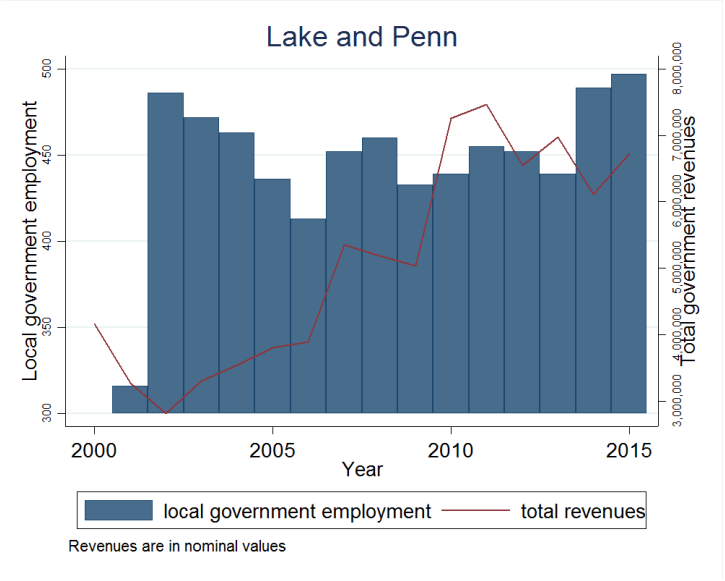

Borough of Yakutat
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values

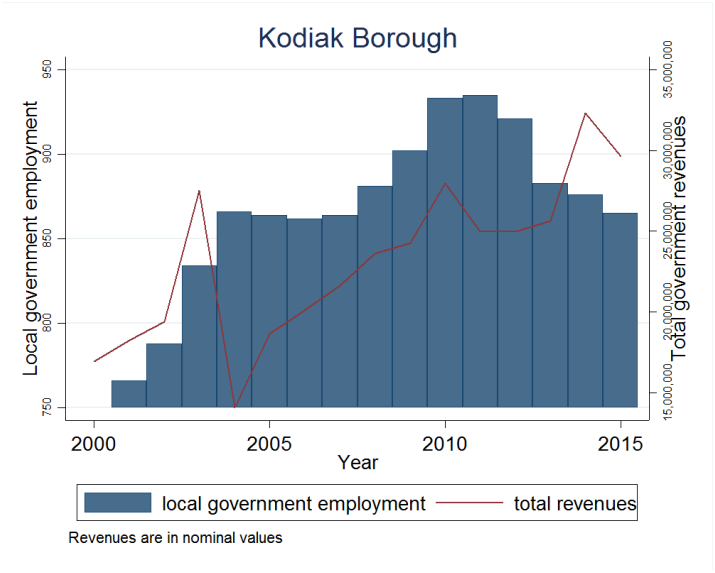

Fairbanks North Star
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values

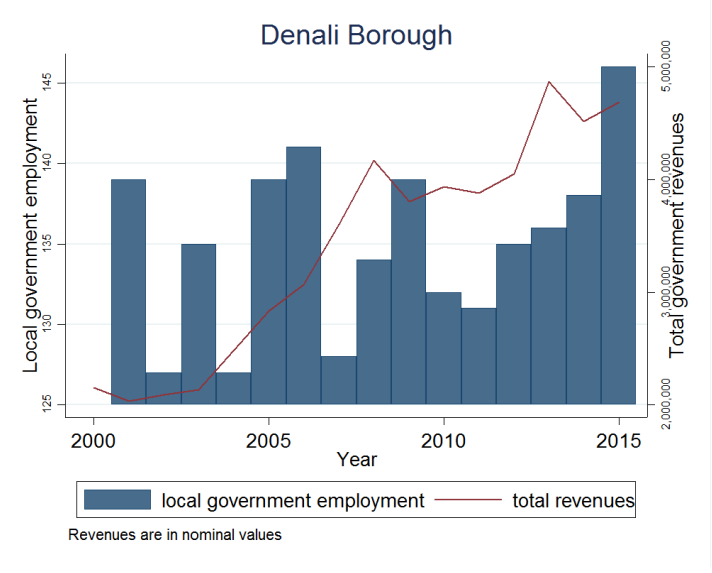

Haines Borough
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values

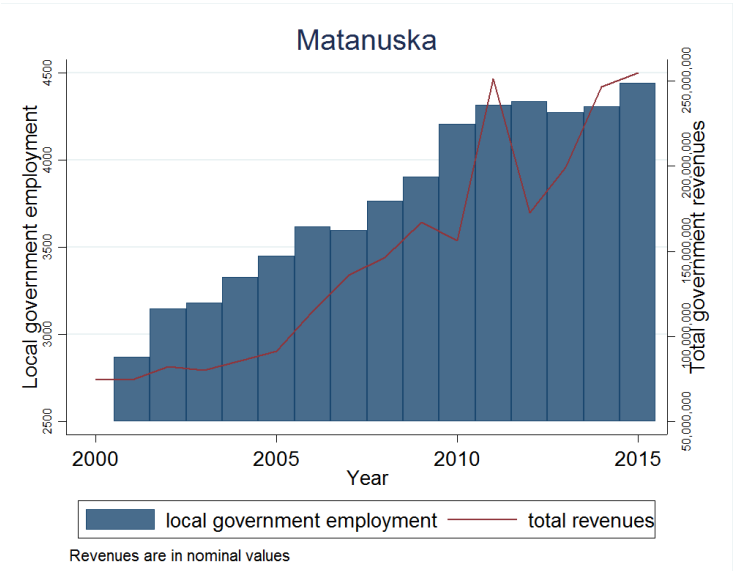

Kenai Peninsula
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values

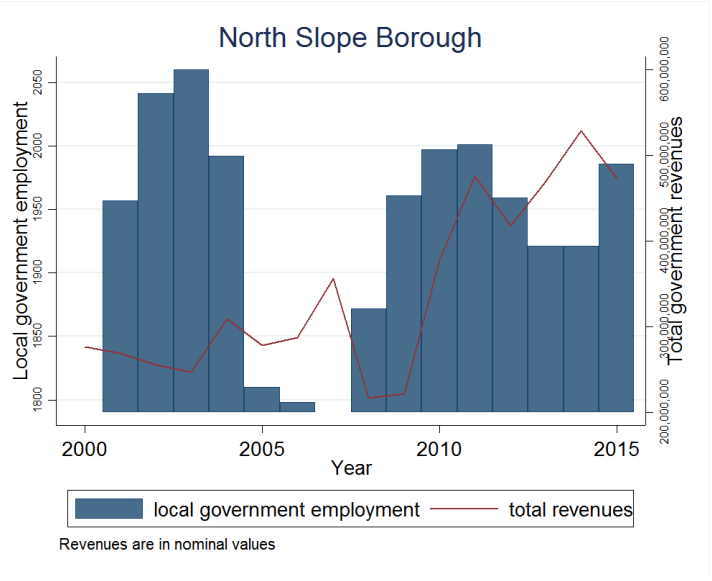

Ketchikan Borough
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values

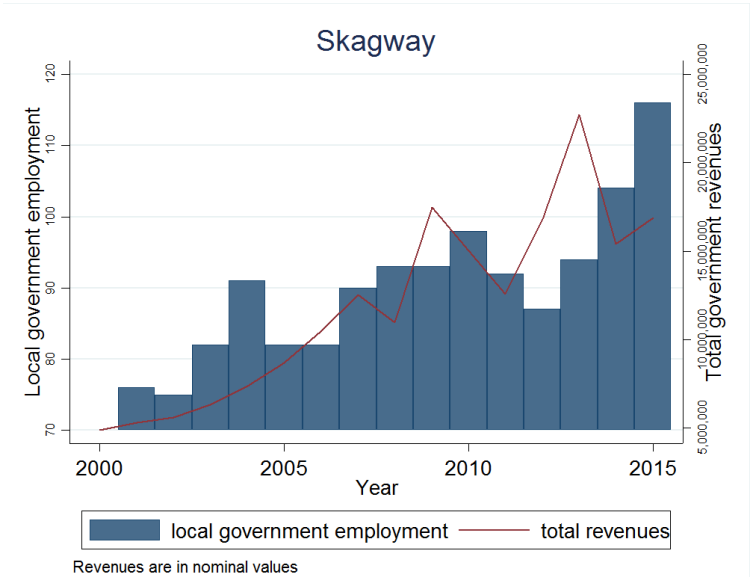

Lake and Penn
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values


Kodiak Borough
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values


Denali Borough
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values


Matanuska
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values


North Slope Borough
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values


Skagway
Local government employment
Total government revenues
Year
local government employment
total revenues
Revenues are in nominal values

How Important are Local Government Wages to Borough Economies?

Table 9 shows local government employment, average wages in local government, total wages, and the share of wages coming from local government. The share of wages coming from local government employment is high overall, ranging from a low of 11% in Fairbanks to a high of 78% in the Lake and Peninsula Borough. Boroughs with diversified economies and high-paying private sector jobs will have a fewer share of their dollars coming from local government. Examining the dependence of the overall economy on local government revenues and local government employment is another way to determine the relative vulnerability of the boroughs to potential declines in money flowing from the state.

Table 9: Local government employment and wages by borough in 2015

	Local government employment in 2015	Average wage in local government	Total wages in the borough	Share of wages coming from local government
Aleutians East Borough	234	$2,712	$22,456,574	33.91%
Borough of Juneau	2172	$4,605	$668,784,603	17.95%
Borough of Sitka	738	$4,342	$135,268,226	28.43%
Borough of Wrangell	265	$3,420	$28,215,450	38.54%
Borough of Yakutat	120	$3,041	$8,492,184	51.57%
Bristol Bay Borough	119	$3,445	$16,186,437	30.39%
Denali Borough	146	$2,795	$36,010,692	13.60%
Fairbanks North Star Borough	3486	$4,240	$1,605,980,000	11.04%
Haines Borough	165	$3,013	$29,970,326	19.91%
Kenai Peninsula Borough	3,500	$4,245	$1,074,509,866	16.59%
Ketchikan Gateway Borough	1,144	$3,985	$234,886,971	23.29%
Kodiak Island Borough	865	$3,410	$202,596,195	17.47%
Lake and Peninsula Borough	497	$2,397	$18,296,974	78.13%
Matanuska-Susitna Borough	4,442	$4,019	$1,825,973,854	11.73%
Municipality of Anchorage	10,682	$4,992	$ 8,862,827,961	7.21%

North Slope Borough	1,986	$4,758	$150,985,839	75.10%
Northwest Arctic Borough	1,145	$3,166	$105,873,857	41.09%
Petersburg Borough	355	$3,273	$36,362,627	38.34%

Conclusion

We have shown that state dollars play a very important role in financing local government in Alaska. The fiscal stress the state is experiencing has yet to make its way to local government budgets. But it seems inevitable that local governments will need to either raise taxes or reduce services as aid from the state drops. We found that state dollars explain a considerable portion of the variation in local government revenues. Also, we found that borough revenues are volatile from year to year. This volatility is high in boroughs with few internal sources of revenues. This last point is important, because taxes—property taxes in particular—tend to be stable while external dollars tend to fluctuate. Since 2005, local governments have become more reliant on state dollars. But this boom period is coming to an end. On the employment front, it is obvious that the employment and wages of local government are crucial to the health of those economies. Going forward, it will be crucial for the vulnerable economies to balance the needs of providing services and imposing taxes that fall on their residents.

Appendix:

Table 9: Intergovernmental dollars received by boroughs not identified as either state/federal

	Intergovernmental dollars Not broken down	**Share of all dollars**
Anchorage	95,127,701	11.64%
Borough of Sitka	2,807,749	6.54%
Borough of Wrangell	2,280,056	20.80%
Fairbanks North Star Borough	1,578,464	0.99%
Ketchikan Gateway Borough	7,299,668	21.18%
Matanuska Borough	84,407,461	33.12%
North Slope Borough	57,515,189	12.16%
Skagway	3,763,602	22.29%
Petersburg Borough	3,069,339	22.11%