

E-mail Dialogue with Patrick Gibbons, NPRI

My original posting: [How Big is Higher Education?](#)

Responses to “How Big is Higher Education?”

Patrick Says:

[January 23rd, 2009 at 2:23 pm](#)

Now now, Dr. Parker, we both know there is no statistically significant relationship between a state's population and its government labor force as a percentage of total population - thus, we both know state's don't take advantage of economies of scale.

Besides, most of the statistics you refer to in arguing we need to spend more assumes the very point in question, this is a fallacy.

Elliott Parker Says:

[January 23rd, 2009 at 10:25 pm](#)

Regarding the question of whether or not there is a correlation between the size of a state and the size, please see Figure 1 in my Dec. 1 memo, at http://www.business.unr.edu/faculty/parker/Parker_memo_12-1-2008rev.pdf. Tell me if you discern a trend.

Regarding the correlation between state public enrollment and the cost of higher education per student, I have an unpublished graph I sent to Regent Knecht that shows a similar trend. If you just look at averages, the smallest ten states have an average cost that is 30% higher per student than it is for the largest ten states. I explained to Regent Knecht why I think that exists. The data I used is on my website. Calculate it yourself.

Finally, I am NOT asking the state to increase our budget. I am asking them to please not CUT it, especially not by 36% (49.8% on UNR's main campus). Is the distinction so hard to understand? We are making good progress as a university, and this will destroy us if it is implemented as the Governor proposed.

I believe with all my heart in the value of public higher education. It is not my pocketbook I care about, it is my university. I, like others, compete in a national marketplace, and I am sure I would land on my feet elsewhere. But I love this place and don't want to leave it, and I don't want our best faculty to leave either.

Elliott Says:

[January 23rd, 2009 at 10:45 pm](#)

Dear Patrick,

By the way, I have been meaning to ask a question, and as an employee of NPRI you might be able to explain.

A few weeks ago, Ty Cobb showed me a graph he received from NPRI showing real Nevada state government expenditures per capita, and it showed dramatic growth over the last couple of decades, with the caption of something “Enough is enough!” I'll find it in my files if you don't know the one.

When I calculated the same thing, however, the trend was pretty flat. See Figure 1(B) in my Jan. 1 memo at http://www.business.unr.edu/faculty/parker/Parker_memo_1-1-2009.pdf. How did you calculate that graph you sent him? It looks to me like you forgot to adjust for inflation. I used the CPI. What did you use?

Thanks,
Elliott

Patrick Says:
[January 28th, 2009 at 2:15 pm](#)

Dr. Parker,

The relationship between a states population and the size of its workforce as a percentage of its population is not significant; in fact there doesn't appear statistical relationship. I used the same data you did. The correlation coefficient alone (-3.8677014162374E-10) suggests we'd have to add 2.5 billion residents to reduce the size of government as a percentage of population by 1 percentage point - hardly an economy of scale advantage.

As far as the 36 percent cuts are concerned, yes that is big. But the growth in appropriations for NSHE has also been massive. We're talking about 10.5 percent growth per year since 2001-2002. A 36 percent cut is deceptively large when we toss how exactly how fast NSHE has been growing over the last few years.

Patrick Says:
[January 28th, 2009 at 2:29 pm](#)

In regards to General Fund spending per capita the data I had only went back to the mid 90s the calculation you reference was prior to the December 1 economic forum update. When going from the mid 90s to today using the new numbers we see a large rise and then a fall (just as your graph does) and the per capita amount is slightly below just a decade ago. Buckley's assertions were essentially incorrect until now (to be fair to her, she used data that was different from the Economic Forum). And yes, it was adjusted for inflation using the CPI (probably to 2007 when it was done earlier last year).

Yes General Fund spending per capita is down since 1974 but so is the importance of the general fund I bet. Meaning that Nevada has increased other fund sources since that time. If you happen to get that data from Andrew Clinger (total budget appropriations and total general fund appropriations) please send it along. I bet you will find that over time per overall per capita funding is not down (and I disagree that this even matters: <http://npri.org/publications/backsliding-from-the-abacus>) and I also bet the general fund grows smaller and smaller as a percentage of the total budget over time.

Thus looking only at general fund appropriations may be a poor way of examining government revenue. Just like saying Nevada's residential tax burden as a percentage of per capita income is a deceptive statistic.

Also, I have not looked at higher ed funding in regards to an alleged economy of scale advantage. I looked at K-12 funding and a state's population size, again no statistically significant relationship. Both the r2 and adjusted r2 were pretty close to 0.

Patrick Says:
[January 28th, 2009 at 2:30 pm](#)

Also the 49% cut is a cut in general fund appropriations, just a portion of the total budget appropriations to UNR.

From: Elliott Parker
Sent: Wednesday, January 28, 2009 4:31 PM
To: Patrick Gibbons
Subject: RE: [UNR Faculty Senate] Comment: "How Big is Higher Education?"

Dear Patrick,

Thanks for your comments on our UNR Senate blog. Just a quick reply for now, and then I will try to write something more for the blog when I have time to answer more definitively.

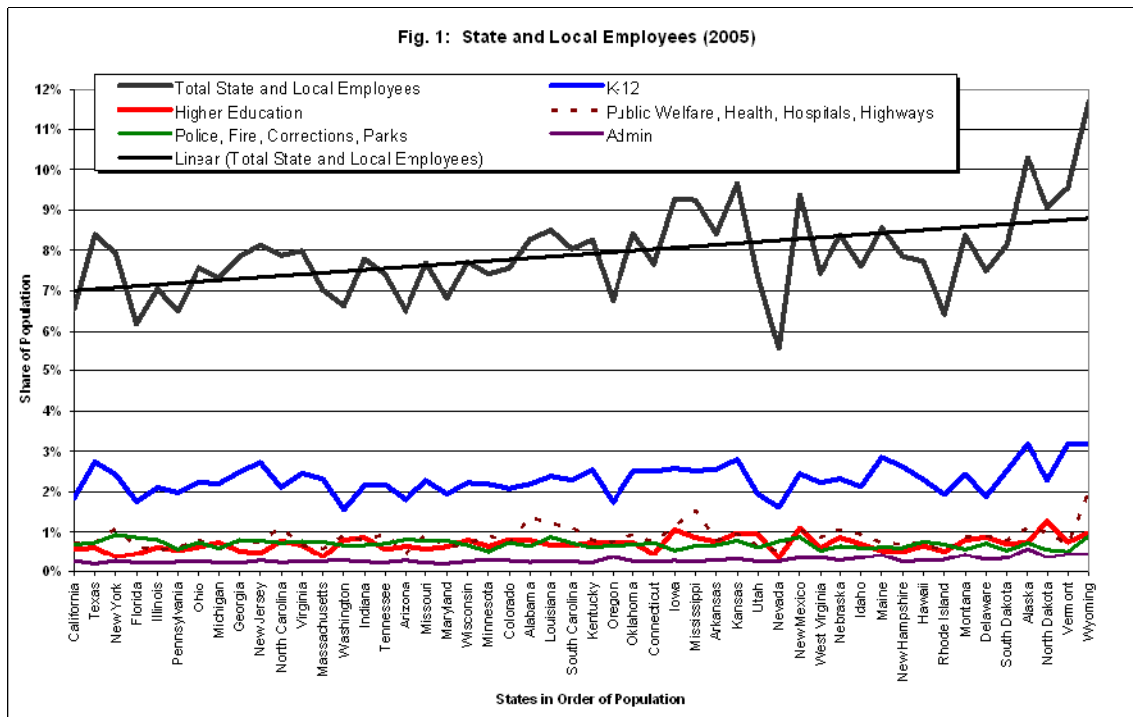
On the economies of scale thing, it was not the core of my argument, only a minor aside. Still, I did not pull it out of my hat. Instead, I used Excel to calculate a simple linear trend to see if what my eyes told me was valid. See chart 1 and 2 in

<http://www.business.unr.edu/faculty/parker/StatAbstract08s0451plus.xls>. Right-click to add a trendline.

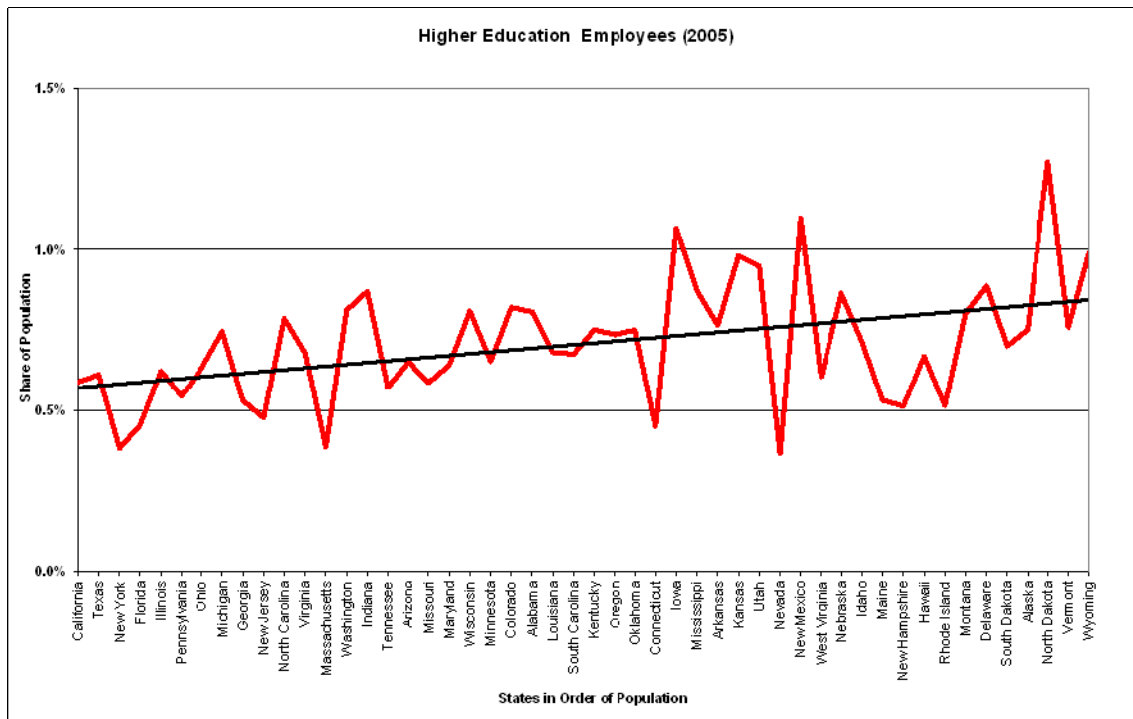
You are right in concluding that I did not run a regression, but I will try to find time in the next few days, after I get some other deadlines met, to take a deeper look at it. I would guess that some components of state spending may have it, and others don't. Doing it right requires more than just one year of data, so I need to collect that too, and there are other possible explanatory factors so I will need to do a literature review.

On total state and local employees (Fig. 1 from my Dec. 1 memo), the trend runs from 7% of population for California to almost 9% for Alaska. So I concluded that smaller states tended to have relatively more state and local employees. In my original Sun article, I actually said, "This is especially surprising because smaller states tend to spend relatively more because of diseconomies of scale." So the first part is accurate, and I inferred the reason. In my Dec. 1 memo, I was more precise than a newspaper column allowed, but I still assumed economies of scale was the reason for the trend. I said, "This first chart also suggests that the national average is not the appropriate standard for comparison, since economies of scale mean that smaller states tend to have a larger percentage of the population working for government. Wyoming and Alaska, for example, are ranked 1st and 2nd in the relative number of government employees, while California is ranked 45th. As a small state, we might expect that Nevada would have a larger government than the national average, not the smallest."

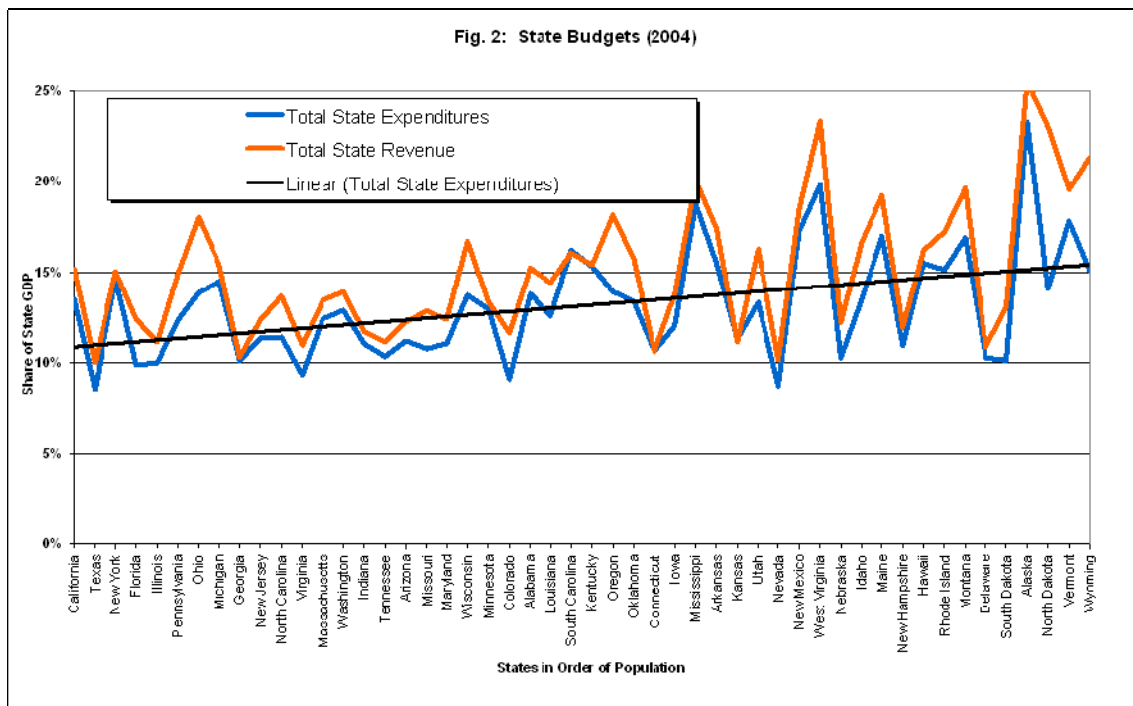
Here is the graph with the trendline. Nevada is about 3/4 of the way down in population order, and is easy to find by the downward spike.



There is a similar trend for higher education employees, from about 0.55% to 0.85%.

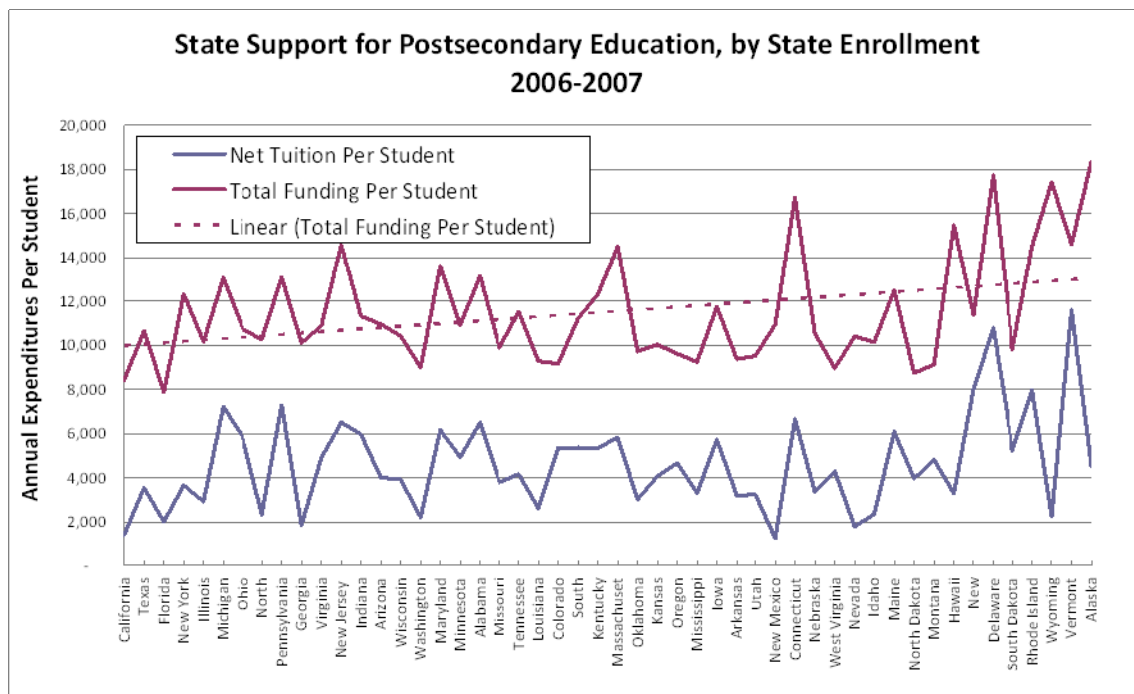


Similarly, in total state expenditures (Fig. 2), the trend runs from 11% for California to over 15% for Alaska, so I inferred that smaller states tend to have more state spending. The line is even steeper for state revenues, but I think that is less relevant because revenues have significantly more variance.



I said nothing about statistical significance, but it is an interesting question to investigate. Maybe I can get a paper out of it someday, or maybe somebody has already written it.

Also, I sent the following graph to Regent Knecht, on total funding per student FTE. Again, smaller states tend to have higher costs per student, in the range of 25-30%. An XY graph on student FTE shows a negative correlation between total student FTE and total funding per FTE, but there is a lot of noise and I did not test this statistically.



I have reasons to think the idea of economies of scale in education is valid, but it is an interesting question to investigate further. To do it right, it should not be done at the average state level but at the institutional level, though some state-size effects may be seen if larger states can have more specialized schools.

What I said to Ron was:

One thing I do agree with you about is the idea that we can frame this budget crisis as an opportunity to take a hard look at what we do and how we do it. I agree, actually, that we all “have a responsibility to do better than we have been doing,” and state institutions need to be especially vigilant in this regard because it is too easy to keep doing what we have always been doing without regard to whether it is worth the cost. I would argue that at my university, at least, we are already doing this. But it is much harder to do than it appears on the surface, in part because of the nature of the university, and in part because of the nature of a budget crisis.

The university is filled with wide array of faculty with very specialized skills. Large universities may have several faculty in each subfield, but in my department, like many others here, we have only one of each in most areas: one labor economist, one macroeconomist, one international economist, one behavioral economist, et cetera. This deep specialization is characteristic of the modern economy, and what makes us a university. It is thus harder for us to cross subdisciplines and teach any but the most general courses – the kind of courses taught at the community colleges – with larger student-faculty ratios. If we lose our graduate macroeconomics professor, for example, who will teach the course instead? Nobody else knows the subject well enough to teach it, especially not in our graduate programs, but our students really need to learn it.

There is, as a result, a minimum efficient scale to a university. If we want higher student-faculty ratios, we need to attract more students, not just reduce the number of our faculty. All this discussion of dramatic budget cuts just scares them off, and we are going the wrong way.

It is not that we are all teaching small boutique courses. I usually teach 250-300 students per year, and that is not unusual here. In addition, when we teach in specialized fields at a higher level, it takes faculty a lot more time per class to prepare, and it takes much more time per student to assess their performance. We also lack large enough classrooms to teach greater numbers, and if we were to ask faculty to teach a significant increase in their sections – assuming we had any free classroom space – we might lose our best researchers to other universities that can afford them more time for their research.

We are gradually becoming a respected doctoral research university. Good research is hard, valuable, and time-consuming. If we lose our best researchers, we no longer provide the research that benefits society, helps it grow faster, and improves all our lives. In the more narrow self-interest, we risk losing the quality and respect we need to attract our best students and keep them in Nevada. If they go elsewhere, Nevada fails to develop the skilled workforce we need. And so on.

An old axiom is that it takes money to make money. It takes a substantial new investment – in new learning technologies, for example, or in larger classrooms – to be able to deliver education in new ways. The nature of a budget crisis, however, is that we do not make these new investments. Instead, we cut salaries and we cut positions, and after we are done we are shocked to find that our most productive people have gone elsewhere, and our students are receiving a poorer education. When the economy recovers and we try to attract new business to our area, in order to broaden our tax base and diversify our economy, we find they don't want to come here unless they have no need for skilled labor whatsoever and are also excused from taxation. And what benefit does that bring to the state?

Anyway, thank you for your patience in allowing me to address your points. Let me know if there is any question I left unanswered, and I look forward to future discussions.

Best regards,

Elliott Parker
Professor of Economics
University of Nevada, Reno

From: Patrick Gibbons
Sent: Wednesday, January 28, 2009 5:03 PM
To: Elliott Parker
Subject: RE: [UNR Faculty Senate] Comment: "How Big is Higher Education?"

Dr. Parker,

Thank you for sending this to me. Please give me some time to digest all this information. I agree that looking at just one year isn't going to give the most accurate numbers, but I'd wager a more comprehensive look wouldn't yield much different results. I did a quick regression because I saw the same trend that you saw except I couldn't see why economy of scale would apply to government.

For example, I had already known that public K-12 schools cost more than \$2,000 more per pupil than private schools (according to the U.S. Department of Education) despite having a pupil to teacher ratio of 18 to 1 vs 8 to 1 in the private schools. We would expect that having more students per teacher would allow public schools to offer education at a lower per pupil cost than private schools, yet this is not the case. (These per pupil education figures did not compute private school donations or subsidies from religious organizations for private schools or capital outlays, teacher pensions, and debt payments for public schools, but this is as accurate as we can get). Given the current lack of incentives for many government agencies to increase efficiency or productivity I find it difficult to believe that governments would be able to take advantage of an economy of scale.

Personally, I like to think – and it may actually be reasonable to assume – that the reason why our state labor force as a percentage of the total population is so low is because we have a more efficient, more productive and more competent government workforce than other states. Not that we underfund government and it cannot afford more workers.

Thank you again.

Sincerely,

Patrick R. Gibbons
Education Policy Analyst
Nevada Policy Research Institute
www.npri.org

PS: The relationship with local government workers and a state's population is even less significant but very intriguing. Why do some states shift government work to the local level and others shift it to a central level? I would have assumed larger states would have larger local governments but that simply was not true.

From: Elliott Parker
Sent: Wednesday, January 28, 2009 5:12 PM
To: Patrick Gibbons
Subject: The graph in question

Dear Patrick,

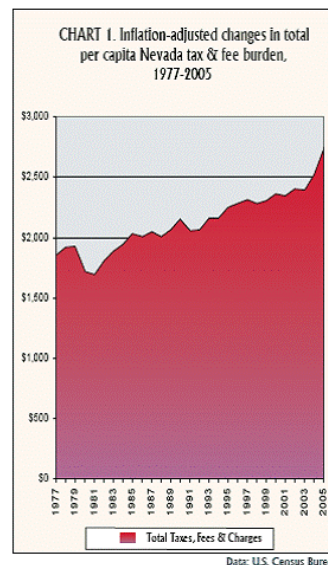
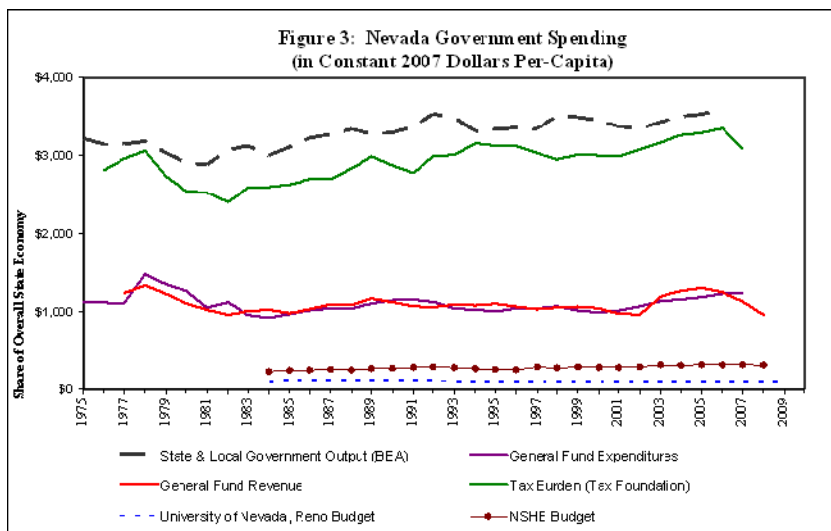
I forgot a couple other things.

First, our other funds besides what comes from the General Fund include tuition, which we can raise – though this will cost us students, and we must consider elasticity in figuring out how much revenue we can raise that way – as well as grants and donations. Grants are not a profit center. Instead, it is based largely on cost reimbursement, and granting agencies will not appreciate if we spend research grants on instruction. Actually, let me be more firm. If we spend research grant monies on instruction and operation, then somebody will go to jail. Similarly, donors tend to earmark their donations for things like new buildings, not keeping the doors open. So there is a real limit to how much state funding can be replaced in the short-run. The tendency to divide things up into different pots of money is a way legislators control the spending of state agencies. It is why the City of Sparks is now starting a highway beautification project even as they are laying off staff.

Second, here is the graph I was asking about:

Ty Cobb says he was sent this by NPRI's Steve Miller. Below it was the caption: “How much is “enough?”

Here is my version of the same graph, and I don't see much resemblance.

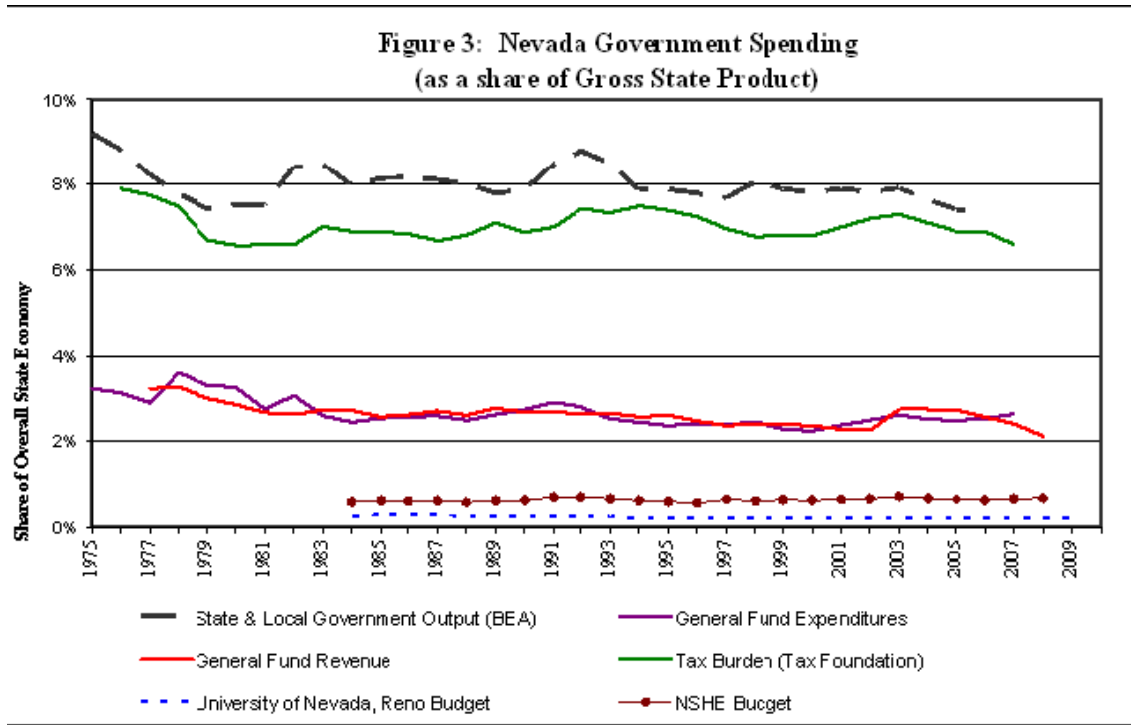


How do I account for the difference?

By the way, General Fund expenditures were 34.2% of total state and local output in 1974 (when my data begins) and 34.1% in 2006 (when my data ends). Not much of a drop. I don't have a consistent time series for total state and local expenditures, but to the extent that expenditures and output differ, it is in transfers that channel primarily through the state from the Feds. And whether or not we have social security or medicare is a different question from whether the state of Nevada has too big a government.

I know the tax burden does not capture the taxes we export to tourists, but it is the only comparable series –over time and across states – that I can find on the Tax Foundation's website. As a share of the tax burden, the General Fund went from 37.3% to 36.5%. Again, not much of a decline in the share.

I also think that there are good reasons why we should expect salaries to rise in real terms over time. They go up for the private sector too, and we share the same labor pool, right? So dividing by GDP makes more sense to me, and here is that graph:



Anyway, I think that is everything. I look forward to hearing from you.

Regards,
Elliott

From: Patrick Gibbons
Sent: Thursday, January 29, 2009 8:11 AM
To: Elliott Parker
Subject: RE: The graph in question

The graph you cite was done by Steven Miller and it was a study that was done before I came on board. Right off the bat I can say there is a difference in terms being explained. One is inflation adjusted Nevada fee and tax burden the other is government spending per capita. One revenue one expenditures – these are rarely the same in Nevada. I don't know what constitutes the make-up of either.

Are all of these data points on the excel spreadsheet you linked to earlier?

I also think that if one wanted evidence that Nevada's government is "underfunded" then dividing it by GSP is the perfect way to do this. Nevada's economy has grown rapidly and our government sector has grown slower relative to many states as a percentage of GSP.

If government spending per capita is flat over time, I would welcome that news. It would suggest our government is behaving more efficiently relative to other states.

Patrick R. Gibbons

From: Elliott Parker
Sent: Thursday, January 29, 2009 9:02 AM
To: Patrick Gibbons
Subject: RE: The graph in question

Dear Patrick,

Well, I agree that revenues and expenditures differ, but over the longer term they should not deviate that much. Otherwise, we would have quite an impressive rainy day fund. I also wonder

if the peak in 2005 in that graph was before or after we Gov. Guinn gave back the DMV tax rebate that year?

My argument is NOT that we are underfunded. My argument is that we are NOT significantly overfunded. I agree that Nevada is relatively efficient compared to other states. I do not want to be California. But I also don't want to be the Ozarks, and I think the mission of the public university is particularly important in a state like Nevada, where more young people forego the long-term benefit for education in favor of the short-run income from service positions. It leads them, and us, into a trap. Without a skilled and educated labor force, we will not attract the businesses that will help us diversify our economy away from gaming. I have colleagues who work with EDawn, and they see the problem regularly as they try to woo investors.

The question you have raised about economies of scale is an interesting one, and I am pondering its implications. Population growth leads to the need for more services, which means even more hiring since service productivity tends to grow more slowly than productivity in goods-producing sectors – this is the basis of Regent Knecht's argument. Real per-capita GDP is important as a measure of average productivity, and it proxies the opportunity cost of labor. We cannot hire good people if we pay them significantly less than they can make elsewhere. So if we have no economies of scale, growth should lead to MORE than a proportional increase in the cost of government services. So if our government sector is growing more slowly, and it is not due to economies of scale, then what does that mean? It means we provide fewer services per capita than before, not more. Or maybe you're right, maybe we are providing the same amount of services more efficiently, in contrast to state governments and universities elsewhere.

I know we are trying hard, and I have seen remarkable improvements in the university since I have come here. The faculty I once thought of as deadwood are mostly gone now. These budget cuts threaten to set us back many, many years. Efficiency is the ratio of value over cost, and if we cut costs so much that value is reduced even more, we are being less efficient, not more.

In my opinion, if the Governor's proposals were actually implemented, the most responsible thing we could do is to stop admitting freshmen, and fire all the faculty that teach them. Then we try to graduate the students we have remaining, and in a couple of years we see if we can start readmitting students, though we would have many empty buildings after that. This is not the official university position, of course.

I am an optimist, however, and hopeful that what we are seeing is mostly political posturing. I am hopeful that we can stop before we drive off the cliff, but that is the way the car is headed.

Regards,
Elliott

From: Patrick Gibbons
Sent: Thursday, January 29, 2009 9:45 AM
To: Elliott Parker
Subject: RE: The graph in question

Dr. Parker,

Thank you again, I do agree with some of what you say. Except when it comes to education, Nevada is already the Ozarks. I don't think increasing funding is the appropriate response to fixing the problem however. Yes, the cuts to higher education are massive – and it probably is just political posturing - but the growth has been massive too. I have no doubt that higher education has gone to great lengths to reduce the cost of education students, but I have a feeling that the surplus money has been spent on other projects so in the end there have been no savings. The school where I earned my MA, for example, used plasma screen televisions for lunch menus in the cafeteria.

The University of North Texas built a lazy inner-tube rafting river – indoors. I don't know what UNR and UNLV are doing but it seems Rogers is addicted to the 10% growth rate NSHE has seen since 2001. I do know that UNLV's Greenspun Hall was built at a cost of \$780 a square foot. Part of that was funded by a \$37 million donation from the Greenspun family – but that alone could have built a palace (120,000 square foot building).

I also have a real problem with universities recruiting into the bottom half of high school students. These students are being set up for failure in higher education. They will likely receive the same job they would have gotten out of high school but be saddled with debt they can ill afford. This seems morally wrong.

Also, attempting to create the education workforce we need should start at the lower grades, not college. 43 percent of Nevada's 4th grade students cannot read at grade level. Of them 52% of African Americans and 58% of Hispanic students cannot read at grade level. This sets these kids up for failure in later years so if we want a highly educated work force we need to start in the early years.

Luckily for some of these kids, Nevada has been blessed with an economic system that does allow students without a college education to live a decent life. As you are well aware our household income and personal income rankings are fairly high as our poverty levels are relatively low.

I agree with you, we can do even better – it seems we may have different ideas on how to achieve those better ends.

Patrick