

# resource revenues and

## FISCAL SUSTAINABILITY

By Gunnar Knapp

### INTRODUCTION

In 1968, the Prudhoe Bay oil field was discovered on Alaska's North Slope – the largest oil field ever discovered in North America. That discovery led to an economic and fiscal transformation of the young state of Alaska. A 1969 sale of Prudhoe Bay leases brought the state \$900 million in one day (\$4.9 billion in 2014 dollars) – six times the state's budget that year of \$115 million (Ragsdale, 2008).

After the completion of the Trans-Alaska pipeline, oil began flowing from the North Slope – bringing the state very large annual oil revenues. Cumulatively, between 1978 and 2014 the state earned \$111 billion in unrestricted general fund oil revenues (\$164 billion expressed in 2014 dollars).<sup>1,2</sup> (See Table 1.)

**TABLE 1**

#### Alaska North Slope Oil Production and Revenues: Selected Indicators

Average daily production (thousands of barrels per day)	FY 1988 (peak production year)	2,005
	FY 2014	531
State oil revenues, FY 2014 (millions of dollars)	Total oil revenues	5,682.9
	Unrestricted oil revenues	4,755.3
	Royalties	1,685.0
	Production taxes	2,598.2
	Corporate income taxes	316.6
	Property taxes	128.1
	Restricted oil revenues	927.6

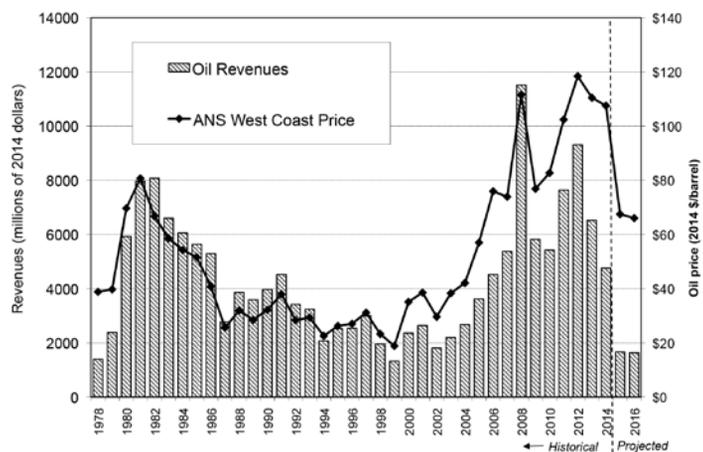
It has not been a smooth ride. Annual state oil revenues have varied widely since North Slope production began, particularly because of changes in oil

prices, but also because of changes in oil production, costs of production, and oil tax laws (Figure 1). Soaring oil revenues in the early 1980s were followed by 20 years of decline, including a very sharp drop in 1987 which contributed to a severe recession in Alaska. Rising prices brought soaring revenues again from 2005 to 2012 – followed by another very sharp drop since 2012, with drastically lower oil revenues projected for FY 2015 and FY 2016.

Gunnar Knapp is director and professor of economics at the Institute of Social and Economic Research, University of Alaska Anchorage. (Gunnar.Knapp@uaa.alaska.edu)

**FIGURE 1**

#### Alaska Unrestricted General Fund Oil Revenues and Oil Prices



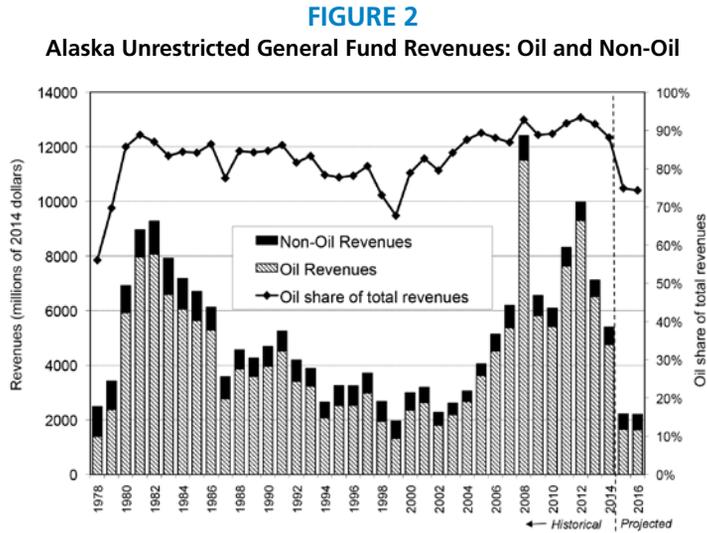
Soaring oil revenues in the early 1980s were followed by 20 years of decline, including a very sharp drop in 1987 which contributed to a severe recession in Alaska.

Rising prices brought soaring revenues again from 2005 to 2012 – followed by another very sharp drop since 2012, with drastically lower oil revenues projected for FY 2015 and FY 2016.

### LESSONS OF THE ALASKA DISCONNECT

Alaska's experience with oil wealth offers cautionary lessons for states or countries fortunate enough to earn large revenues from a single resource industry. Even with very large resource revenues it is advisable to maintain some level of taxes on the general population and other industries. Without these "broad-based taxes," growth in other industries increases government costs without corresponding increases in government revenues, increasing fiscal dependence on the resource industry and vulnerability to production or price decreases. The absence of broad-based taxes enables the growth of marginally profitable industries that are unable to "pay their own way" if or when the resource revenues decline.

As state oil revenues grew, so did the state's fiscal and economic dependence on oil revenues (Figure 2). For the period 2005-2014 oil revenues averaged 90 percent of UGF revenues.



Non-oil revenues are mostly from corporate income taxes, excise taxes (mostly insurance premiums, motor fuel and tobacco), fisheries and mining taxes, charges for services, and licenses and permits (Table 2). Alaska collects no broad-based income taxes or general sales taxes: the legislature voted to eliminate an individual income tax in 1980, as oil revenues soared.

**TABLE 2**  
**Alaska FY 2014 Non-Oil General Fund Unrestricted Revenues**

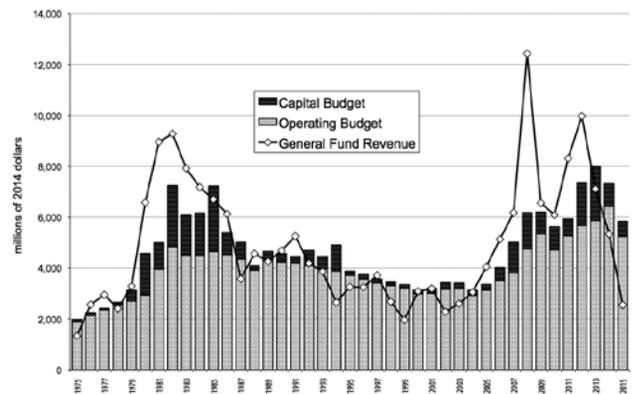
	\$ million	percent
Corporate income taxes	104.1	31.1%
Insurance premium taxes	55.4	16.6%
Tobacco taxes	42.8	12.8%
Motor fuel taxes	39.3	11.7%
Other excise taxes	28.1	8.4%
Fisheries taxes	32.2	9.6%
Mining tax	32.8	9.8%
Charges for services	24.2	7.2%
Licenses and Permits	42.7	12.8%
Rents & Royalties	33.0	9.9%
Miscellaneous	62.7	18.7%
Total	334.7	100.0%

In 2012, local governments accounted for 18 percent of total state and local government own-source revenues in Alaska, compared with 46 percent nationally (U.S. Census Bureau). Oil and gas property taxes accounted for 24.5 percent of local government tax revenues, of which 95 percent was collected by

two jurisdictions, the North Slope Borough and the City of Valdez (Alaska Department of Commerce, 2012). Other local property taxes accounted for 56 percent of local government revenues and sales taxes accounted for 14 percent.

Alaska's response to oil wealth was in some ways typical of oil-rich states and nations. When oil revenues were growing, it greatly increased both operating and capital spending, responding to strong public demands for more and better services and infrastructure (Figure 3). It invested in a wide range of economic development and diversification projects, with varying degrees of success (and some spectacular failures). When oil revenues were falling, it cut back on spending – particularly for capital projects.

**FIGURE 3**  
**Alaska Unrestricted General Fund Revenues and Budget**



Unlike many other oil-rich states and nations, Alaska also saved a significant share of oil revenues. Part of the savings were of unrestricted general fund surpluses in years when revenues were rising, much of which were deposited in “rainy day” savings funds. These funds paid for large deficits when oil prices were falling in the late 1990s and since 2013.

In 1976, voters adopted a constitutional amendment to create the Alaska Permanent Fund, in which at least 25 percent of oil and other resource royalties must be deposited. The principal of the fund may not be spent: only realized investment earnings may be spent. With royalty contributions, “inflation proofing” contributions from earnings, and special contributions by the legislature in years of high surpluses, the value of the Fund grew to more than \$50 billion by the start of FY 2015 (Alaska Permanent Fund Corporation, 2015).

Beginning in 1982, the state began an annual distribution of a share of the Permanent Fund's earnings as “dividends” to all Alaska residents (including children). The amount distributed annually is approximately equal to half of the average annual realized earnings over the preceding five years. In 2014, the state distributed dividends of \$1,884, at a total cost of \$1.2 billion. Not surprisingly, the Permanent Fund Dividend program has become enormously popular among Alaskans.

## THE ALASKA DISCONNECT

Alaska's high dependence on oil revenues, and the corresponding low level of broad-based taxes, has led to a problem which University of Alaska Anchorage Professor Scott Goldsmith has described as the "Alaska Disconnect":

"In most states economic development that brings new jobs and payroll generally pays its own way from the perspective of the public treasury. Because of the Alaska Disconnect, economic development in Alaska does not pay its own way . . . In Alaska, only oil pays its own way. For several decades Alaska has been the beneficiary of growth driven by the development of our oil resources – resources of high market value compared to their cost of production. The huge profits, shared among the companies, the federal government, and Alaska state and local governments have been more than enough to ensure that the oil industry has paid its own way – and more. Today, because of a combination of low taxes and high expenditures, no other industry pays its own way. . . Furthermore, it is hard to imagine any new economic development that would pay its own way in our current low tax environment (Goldsmith, 1990).

Goldsmith defined the following as necessary conditions for a new business to "pay its own way":

- "Business and household taxes and fees paid by the new business and its workers are sufficient to pay for the public services (1) directly required by the new business activity (like infrastructure development and regulation) and (2) directly required by the new workers and their families (like schools and teachers for the children, police and fire protection, and new road construction and maintenance)."
- "Taxes and fees collected from the spinoff businesses and their workers generated by the new economic development are sufficient to cover the public sector costs imposed by those spinoff businesses and families."

Under what conditions will growth in an industry "pay for itself" – in the sense that the increase in government revenues is sufficient to cover the increase in government costs? The answer depends on the direct taxes paid by the industry, the broad-based taxes paid by the general population, the costs of government services for the industry, the costs of government services for the general population, and how growth affects the population.



*Pipelines on Alaska's North Slope.*

Based on 1999 state and local tax and expenditure data, Goldsmith estimated that "each new job directly created by economic development results in an annual drain on the public treasury of \$1,100 . . . The Alaska Disconnect could be offset in this case by a broad-based tax that generates revenues of about \$640 per new job, including both those jobs directly created by the new development and those additional jobs created by the 'multiplier' effect."

Goldsmith noted that his estimates were for a "very optimistic scenario of economic development," because the estimates were for Anchorage, where local government broad-based taxes per capita are relatively high and government expenditures per capita are relatively low compared with other areas of Alaska.

## WHAT AFFECTS WHETHER ECONOMIC GROWTH "PAYS FOR ITSELF"?

Under what conditions will growth in an industry "pay for itself" – in the sense that the increase in government revenues is sufficient to cover the increase in government costs? The answer depends on the direct taxes paid by the industry, the broad-based taxes paid by the general population, the costs of government services for the industry, the costs of government services for the general population, and how growth affects the population. The appendix to this article shows mathematically how all these factors affect the changes in revenues and costs associated with growth in an industry. In general:

1. Whether growth in an industry pays for itself depends in part on whether the increase in revenues paid directly by the industry exceeds the increase in government costs directly associated with the industry.

**TABLE 3**

**State of Alaska FY 2014 Unrestricted General Fund Non-Oil Revenues and Unrestricted General Fund Budgets for Agencies Providing Broad-Based Services**

Budget components	Total (\$000)	Per-capita
Unrestricted General Fund non-oil revenues	638,700	\$854
Unrestricted General Fund budgets for agencies providing broad-based services	3,516,771	\$4704
Department of Education & Early Development	1,282,644	\$1716
Department of Health & Social Services	1,246,874	\$1668
University of Alaska	371,324	\$497
Department of Corrections	297,398	\$398
Department of Public Safety	172,553	\$231
Judiciary	110,574	\$148
Department of Labor and Workforce Development	35,404	\$47

Source: Alaska Legislative Finance Division.

- Whether growth in an industry pays for it depends in part on whether the increase in broad-based revenues driven by population growth exceeds the increase in broad-based costs associated with population growth, including (importantly) the increase in education costs associated with growth in the school-age population. This depends in turn on whether per-capita broad-based taxes exceed per-capita costs of public services.
- If per-capita broad-based taxes are less than the per-capita costs of public services, the effects are magnified by the extent to which economic growth in an industry results in population growth, including (importantly) the extent to which it results in growth in the school-age population. This depends on several key factors, including:
  - The “multiplier” effects of employment growth in the industry on employment in other industries.

- The extent to which employment growth causes population growth.
- The share of population growth which is school-age children, who add to education costs without increasing revenues.

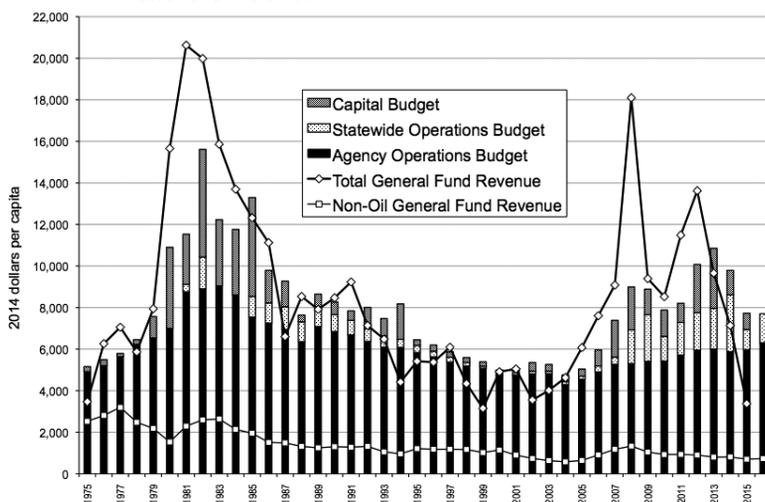
**ALASKA BROAD-BASED REVENUES AND EXPENDITURES**

Comparison of Alaska state and local non-oil revenues and broad-based expenditures shows that for most Alaska industries and in most parts of Alaska, growth does *not* “pay for itself,” at either the state or local levels. In FY 2014, the unrestricted general fund budgets for agencies providing broad-based services were more than five times as high as all unrestricted general fund non-oil revenues. Even if the marginal costs associated with employment and population growth in non-oil industries were far lower than average costs, it is hard to imagine how marginal non-oil revenues could pay for them (Table 3).

Figure 4 provides a longer-term comparison of real per-capita state budget levels with real per capita revenues. Total revenues have fluctuated widely over the past four decades, with short-term trends reflecting oil prices while the long-run declining trend reflects the 75 percent decline in oil production since 1988. Total spending has fluctuated with revenues, but the most dramatic fluctuations have been in the capital budget and the “statewide operations” budget (which pays for debt service, contributions to retirement funds to offset unfunded liabilities, and other spending not attributable to specific state agencies). The agency operations budget – which pays for the state agencies which provide broad-based services, has been much more stable. However, over the entire period, per-capita non-oil revenues have trended downward as population has grown.

**FIGURE 4**

**Alaska Per Capita Unrestricted General Fund Revenues and Budget**





A Bristol Bay salmon fisherman with a boat load of sockeye salmon. Alaska's commercial fishing industry employs far more people than the oil industry but contributes far less in state taxes.

### ALASKA'S CURRENT FISCAL CHALLENGE

During the 1990s and early 2000s, falling oil prices and production led to a long period of declining real (inflation-adjusted) Alaska oil revenues (Figure 3). Despite declining real expenditures, for much of this period, the state ran budget deficits, which it paid for by drawing down savings in reserve funds created from earlier surpluses and special tax settlements. As these savings were depleted, there was increasing concern that the state's fiscal structure was unsustainable, and would have to be addressed not only through budget reductions but also new revenues and uses of Permanent Fund earnings to help fund state government (with corresponding reductions in Permanent Fund dividends).

These highly unpopular options were avoided when oil prices soared after 2005, bringing the state record revenues and large surpluses – despite rapid growth in spending. However, falling oil prices after 2012, and then a more-than 50 percent drop in prices during the first half of fiscal year 2015, brought ever-increasing deficits – projected at \$3.5 billion at the time of writing – a sense of fiscal crisis, and a renewed recognition that the state's fiscal situation was unsustainable, and that deficits would likely erase reserves within seven years and possibly much sooner if oil prices stayed low.

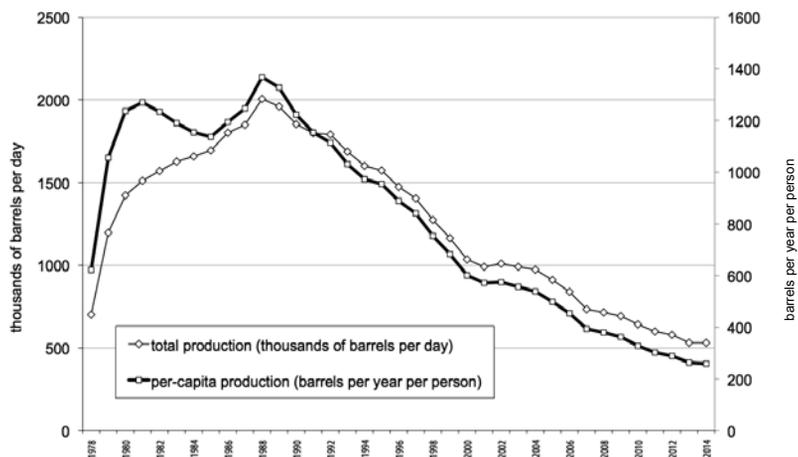
Clearly, over the long-term, Alaska will have to diversify its revenue sources. North Slope oil is a finite resource; production has been declining for decades and is at one-fourth of its 1988 peak.

As during the earlier fiscal crisis of the 1990s, imposing new taxes or using Permanent Fund earnings remain highly unpopular among Alaskans as options for addressing the state's fiscal challenge. At the start of the 2015 legislative session, both the governor and legislative leaders declared these options “off the table” at least until state spending was substantially reduced – despite the fact that addressing a more-than-50 percent deficit through budget cuts alone seemed improbable at best. More popular is the decades-old argument for the need to diversify Alaska's economy to reduce the state's dependence on oil.

But economic diversification has been relatively modest – occurring primarily through growth of other resource-based industries (seafood, mining, and tourism) and air cargo. It has not reduced Alaska's dependence on oil revenues. And because of the “Alaska disconnect,” economic growth in industries other than oil would increase rather than decrease Alaska's fiscal challenge.

Clearly, over the long-term, Alaska will have to diversify its revenue sources. North Slope oil is a finite resource; production has been declining for decades and is at one-fourth of its 1988 peak. Because Alaska's population has been growing, per capita oil production has fallen even further, to just 18 percent of the 1988 peak (Figure 5). As oil production declines, the state cannot continue to fund broad-based services primarily from oil.

**FIGURE 5**  
Alaska North Slope Oil Production



Luckily for Alaska, the very large accumulated savings of the Alaska Permanent Fund provide the potential for a much higher level of about \$4.0 billion in sustainable yield from a combination of both resource revenues and investment earnings (Goldsmith). But the higher the rate of future population growth, the lower the per capita potential future yield.

## REFLECTIONS ON LESSONS OF THE ALASKA DISCONNECT

Alaska's experience with oil wealth offers cautionary lessons for regions, states or countries fortunate enough to earn large revenues from a single "resource industry" such as oil. Even if these revenues are very large – enough to pay for all or most government services – or even to greatly expand these services – it is nevertheless advisable to maintain at least some level of "broad-based taxes" on the general population and other industries. The reasons are difficult to see or appreciate in the short term – but they become increasingly important over time. The following reflections are the author's perspective after decades of observing Alaska's fiscal circumstances and political debates over fiscal policy.

1. Having diversified revenues reduces both the volatility of government revenues as well as the vulnerability to revenue shortfalls in the event of unexpected shortfalls. Resource revenues are both volatile and difficult to predict. Dependence on resource revenues makes public revenues more volatile and difficult to predict.
2. Without broad-based taxes, diversified economic growth – in industries other than the resource industry – increases government costs without corresponding increases in government revenues, increasing fiscal dependence on the resource industry and vulnerability to production or price decreases. Even if there were easy ways to diversify the Alaska economy away from oil – under the current tax structure they would not add significant new revenues.
3. The absence of broad-based taxes enables the growth of marginally profitable industries that

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Not paying broad-based taxes reduces the interest and involvement of citizens in choices about how much money government spends and what it spends it on. For more than three decades, the total level of state spending has received little scrutiny from most Alaskans, as long as they felt they were getting their "fair share" of state spending.

are unable to "pay their own way" if or when the resource revenues decline. Similarly, it enables employment of marginally-paid workers who cannot afford to "pay their own way" if or when resource revenues decline.

4. Fiscal dependence on the resource industry may lead to political pressures to increase revenues from the industry, potentially slowing growth of the industry over time.
5. Not paying broad-based taxes reduces the interest and involvement of citizens in choices about how much money government spends and what it spends it on. For more than three decades, the total level of state spending has received little scrutiny from most Alaskans, as long as they felt they were getting their "fair share" of state spending.
6. Unsustainable dependence on resource revenues may discourage investment by firms which fear abrupt and potentially high future taxes once the resource revenues are no longer available. ☹

## ENDNOTES

- <sup>1</sup> Except where otherwise noted, all financial data in this article are for Alaska fiscal years (July 1-June 30). State budget data were provided by the Alaska Legislative Finance Division ([www.legfin.akleg.gov](http://www.legfin.akleg.gov)). Alaska revenue and oil production data are from the annual Fall Revenue Sources Books of the Alaska Department of Labor Tax Division ([www.tax.alaska.gov/programs/reports.aspx](http://www.tax.alaska.gov/programs/reports.aspx)).
- <sup>2</sup> This figure excludes restricted oil revenues, including oil royalties deposited in the Alaska Permanent Fund.

**APPENDIX:  
BASIC MATHEMATICS OF NECESSARY CONDITIONS FOR ECONOMIC GROWTH TO “PAY FOR ITSELF”**

To illustrate mathematically the conditions under which an industry “pays for itself,” consider a simplified case of a region with two kinds of government revenues and three kinds of government costs:

Revenues	Industry revenues	Taxes and other revenues paid by the industry
	Broad-based revenues	Taxes and other revenues paid by the general population
Costs	Industry costs	Costs of government services for the industry
	Broad-based costs	Costs of services for the general population
	Education costs	Costs of K-12 education

The impacts on revenues and costs associated with growth of an industry are given by the formulas shown in the table below:

Type of impact	Formula	Definitions
change in industry revenues	output impact x industry tax rate	<u>output impact</u> = change in value of industry output resulting from growth of the industry <u>industry tax rate</u> = revenues paid by industry from all sources per dollar of output
change in broad-based revenues	population impact x per-capita tax rate	<u>population impact</u> = change in population resulting from growth of the industry <u>per capita tax rate</u> = average total taxes paid by households / total population
change in industry costs	output impact x industry cost factor	<u>output impact</u> = change in value of industry output resulting from growth of the industry <u>industry cost factor</u> = industry costs per dollar of output
change in broad-based costs	population impact x per-capita costs	<u>population impact</u> = change in population resulting from growth of the industry <u>per capita costs</u> = per-capita cost of broad-based services
change in education costs	student impact x cost per student	<u>student impact</u> = change in school-age population resulting from growth of the industry <u>cost per student</u> = education cost per student

Note that changes in broad-based revenues, broad-based costs, and education costs depend on how the total population and the school-age population are affected by growth of the industry. At one extreme, if the economy is closed to immigration, or if any increase in overall employment is filled entirely by workers from within the region, there will be no population impact and no student impact – and also no corresponding increases in broad-based revenues, broad-based costs, or education costs.

At the other extreme, if the economy is very open to immigration, and/or is already at full-employment, then any increase in overall employment may be filled mostly by workers from outside the region – who either take the new jobs created by the growth or alternatively fill in the jobs left by residents to take the new jobs created by the growth. This in turn would lead to growth in both the total population and the student population:

Type of impact	Formula	Definitions
population impact	direct employment impact x employment multiplier x population response ratio	<u>direct employment impact</u> = the number of new jobs in the industry created by growth <u>employment multiplier</u> = ratio of total new jobs to new jobs in the industry <u>population response ratio</u> = ratio of population growth to total new jobs
student impact	population impact x school-age share	<u>school-age share</u> = school-age children share of population growth

Having defined these terms, here are four different ways of comparing the changes in government revenues and costs resulting from growth in an industry:

Change in revenues	Change in costs
change in industry revenues + change in broad-based revenues	change in industry costs + change in broad-based costs + change in education costs
output impact x industry tax rate + population impact x per-capita tax rate	output impact x industry cost factor + population impact x per-capita costs + student impact x cost per student
output impact x industry tax rate + population impact x per-capita tax rate	output impact x industry cost factor + population impact x [per-capita costs + (school-age share x cost per student)]
output impact x industry tax rate + direct employment impact x employment multiplier x population response ratio x per-capita tax rate	output impact x industry cost factor + direct employment impact x employment multiplier x population response ratio x [per-capita costs + (school-age share x cost per student)]

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