



Economic Impacts of Alaska Fiscal Options

Draft Report

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This is a draft report.
We invite comments and questions.
These should be sent to Gunnar Knapp at:
Gunnar.Knapp@uaa.alaska.edu
by March 18, 2016.

We will prepare a final report incorporating
responses to comments and questions
by March 25, 2016.

Some of the estimates in this report are changed slightly
from earlier presentations we have made about this analysis.
These changes are due to minor technical corrections which we
made while preparing the technical documentation for the report,
and do not change any conclusions which might be
drawn from any of the analysis.

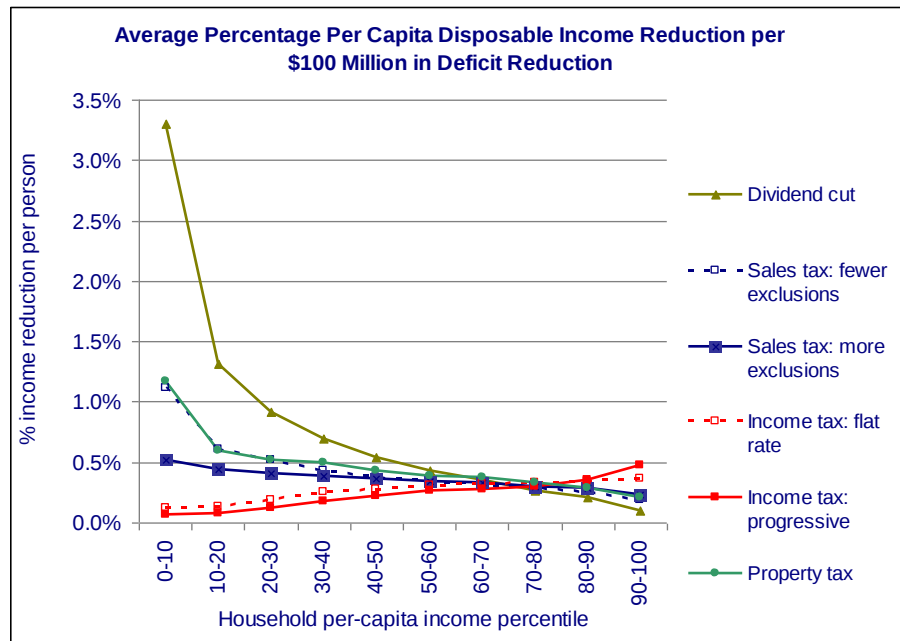
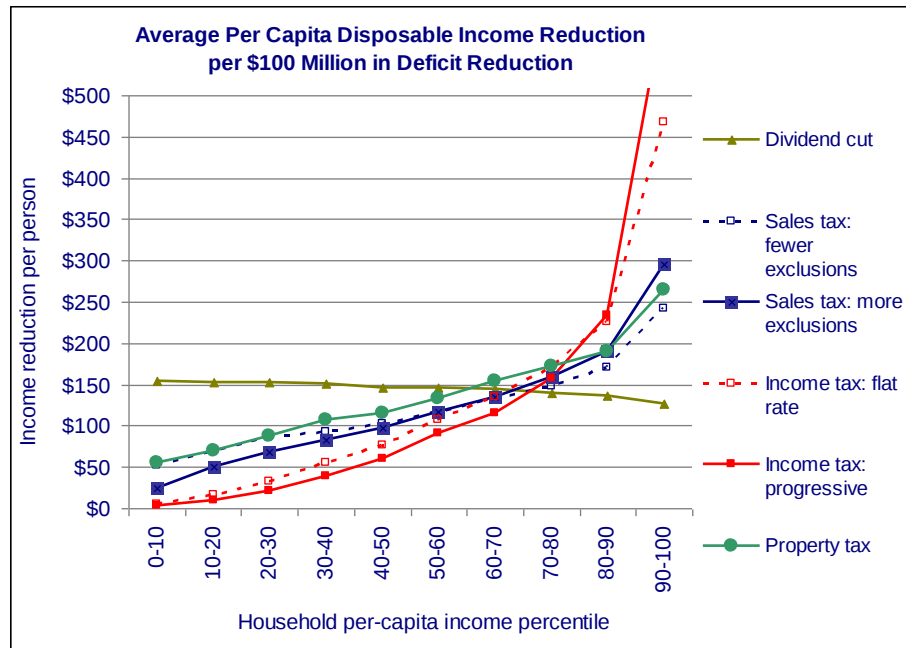
EXECUTIVE SUMMARY

This study compares potential revenue impacts and short-run economic impacts of eleven “fiscal options” for reducing Alaska’s budget deficit, including several types of spending cuts, several types of taxes, dividend cuts and saving less of Permanent Fund earnings. The study does not advocate for or against any option.

About 9-11% of sales taxes would be paid by visitors to Alaska, about 6-7% of income taxes would be paid by non-residents working in Alaska, and at least 3% of a statewide property tax would be paid by non-resident property owners.

The costs to Alaskans of income taxes, sales taxes, and dividend cuts would be partly offset by reductions in their federal income tax obligations. The reduction of federal taxes would be about 9-11% for income taxes, and 7-8% for sales taxes, 8% for a property tax, and 6% for dividend cuts. Reductions in federal taxes would most benefit higher-income households which pay higher marginal federal income tax rates.

Dividend cuts would most affect the lowest-income households, both in the total and relative loss of income. Income taxes would most affect the highest-income households. Sales taxes would have intermediate effects, as would combinations of taxes and dividend cuts.



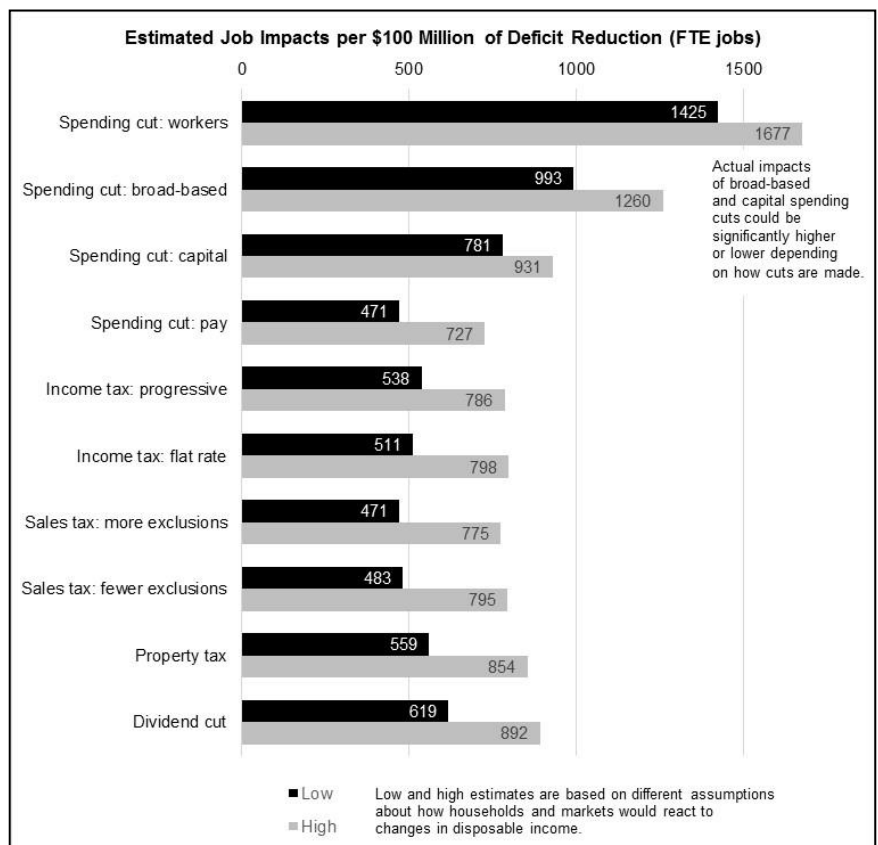
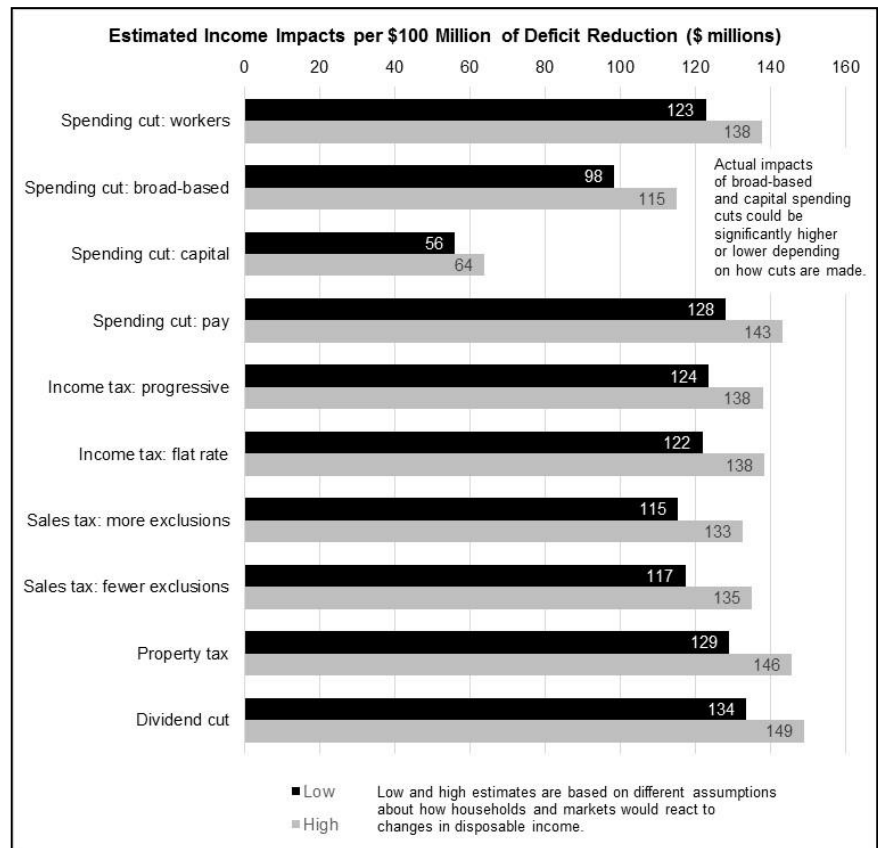
The estimated short-run income and job impacts of different fiscal options include both direct impacts (the initial losses in income and jobs) as well as multiplier impacts due to reductions in spending by households and businesses.

The impacts of spending cuts would vary significantly depending on the types of cuts and the extent to which they include cuts to jobs or pay of workers.

Dividend cuts would have the greatest short-run impacts on income—because they would have the greatest direct impacts on Alaskans' incomes. Taxes would have smaller direct impacts on incomes because they would be partly paid by non-residents.

Cutting spending for government workers would have the greatest short-run impacts on jobs—because the job losses would include both direct job losses for government workers as well as multiplier job losses due to reduced spending.

Of all the fiscal options for closing the deficit, only saving less of the Permanent Fund earnings which are currently added to the principal as inflation proofing or added to the Permanent Fund earnings reserve (approximately half of realized earnings over time) would have no short-run economic impacts. But saving less would result in slower Permanent Fund growth and smaller future earnings.



Summary of Fiscal Options & Estimated Impacts per \$100 Million of Deficit Reduction

Fiscal Option	Direct economic impacts	Who would be most affected	Short-run income impacts (\$ millions)	Short-run job impacts (FTE jobs)
Spending cut: workers	Reduce gov't jobs & pay	Gov't workers	123 - 138	1425 - 1677
Spending cut: broad-based	Reduce gov't jobs & pay Reduce other gov't purchases	Gov't workers Gov't contractors & workers	98 - 115	993 - 1260
Spending cut: capital	Reduce gov't capital spending	Construct. ind. & workers	56 - 64	781 - 931
Spending cut: pay	Reduce gov't employee pay	Gov't workers	128 - 143	471 - 727
Income tax: progressive	Reduce Alaskans disposable income	Higher income Alaskans	124 - 138	538 - 786
Income tax: flat rate			122 - 138	511 - 798
Sales tax: more exclusions		Medium & lower income Alaskans	115 - 133	471 - 775
Sales tax: fewer exclusions			117 - 135	483 - 795
Property tax			129 - 146	559 - 854
Dividend cut	Reduce Alaskans' income	Lower income Alaskans	134 - 149	619 - 892
Saving less	No short-term impacts	Future Alaskans	0	0

Note: The numbers shown for income and job impacts represent low and high estimates of impacts based on different assumptions about how households and markets would react to changes in disposable income.

The relative impacts of different fiscal options would vary for different regions of Alaska because income distribution varies between regions and because the economies of different regions vary in their relative dependence on state-funded jobs and services and on the trade and service industries which would be affected by the multiplier impacts of fiscal options.

Within a few years we will have to greatly reduce the deficit. Reducing the deficit will significantly impact Alaska's economy, regardless of how or when we do it. Fully closing the deficit in one year would have a large impact on an economy already weakened by oil industry job cuts and past cuts to state capital spending. But not making significant progress towards reducing the deficit would also have large negative impacts including increased business and consumer uncertainty, reduced private investment, and further downgrading of Alaska's credit rating. Our economic adjustment to lower oil revenues will be smoother if we substantially reduce the deficit this year and also clearly demonstrate to Alaskans, businesses, and investors that we will make the necessary further changes to spending, revenues and uses of Permanent Fund earnings to achieve sustainable state finances, reduce uncertainty about future state spending and how we will pay for it, and build confidence in Alaska's fiscal future.

Alaska's fiscal options would impact Alaska's economy and society in many important ways beyond the short-term economic impacts which we estimated for this study. We should base our fiscal choices not only on their short-term economic impacts but also on their longer-term impacts on Alaska's economy and society over time.

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I. INTRODUCTION

The state of Alaska faces a very serious fiscal challenge. This year's (FY16) general fund spending greatly exceeds current and projected future general fund revenues. We have been paying for the resulting deficit between general fund spending and revenues by drawing down savings in the Constitutional Budget Reserve Fund (CBRF) and other funds. Because our savings are limited, within a few years we will have to significantly reduce the deficit.

Alaskans are currently engaged in an important discussion of how and when we should close the deficit. Among the important considerations in this discussion are the impacts that these choices might have on Alaska's economy. This study looks at some of these potential economic impacts for a range of fiscal options.

Fiscal Options

We use the term "fiscal option" to refer to sustainable approaches the state might take within the next three years to reduce the deficit. We define the "deficit" as the difference between the state's unrestricted general fund appropriations and revenues.

We estimated both revenue impacts and short-run economic impacts of the ten fiscal options summarized in Table I-1. We use the term "revenue impacts" to refer to how much income the tax and dividend-cut options would collect from (or not pay to) Alaska residents and non-residents, by income group. We use the term "short-run economic impacts" (or sometimes "economic impacts") to refer to the short-run direct and multiplier impacts that the fiscal options would have on Alaska jobs and income.

Table I-1
Fiscal Options for Which We Analyzed Both Revenue Impacts and Economic Impacts

Fiscal option	Description
Spending cut: workers	A spending cut achieved entirely by reducing the state workforce
Spending cut: broad-based	A spending cut achieved by a broad range of cuts to state spending
Spending cut: capital	A spending cut achieved by cutting the capital budget
Spending cut: pay	A spending cut achieved entirely by reducing the pay of state workers
Income tax: progressive	Constant percentage of the taxpayer's federal individual income tax liability
Income tax: flat rate	Constant percentage of federal taxable income
Sales tax: more exclusions	Four percent sales tax on retail expenditures excluding food at home, health care, education, and shelter
Sales tax: fewer exclusions	Three percent sales tax on retail expenditures excluding health care and education
Property tax	20 mil (2 percent) tax assessed on real and personal property with an exclusion for the amount of property taxes currently paid to local governments
Dividend cut	Reducing Permanent Fund Dividends and diverting amount of Permanent Fund earnings that would have paid for dividends to fund general fund spending.
Saving less	Using some of the annual Permanent Fund earnings that are currently saved in the Permanent Fund (either in the principal as inflation proofing or in the earnings reserve) to fund general fund spending. We exclude uses of earnings above the average level of earnings not used for dividends, which would result in drawing down the Permanent Fund earnings reserve over time.

Table I-2
Fiscal Options for Which We Analyzed Only Revenue Impacts

Fiscal option	Description
Excise tax: motor fuels	Increase in the state motor fuels tax
Excise tax: alcohol	Increase in state alcoholic beverages tax
Excise tax: tobacco	Increase in the state tobacco tax

In choosing fiscal options to analyze for this study, we tried to select a range of options which met the following criteria:

- Part of the political discussion: options which are currently being discussed as potential options for reducing the deficit.
- Short-term options: options which could, if implemented, reduce the deficit within the next three years. Thus we didn't analyze options which would take longer to affect state revenues or spending, such as encouraging new kinds of economic development which might generate new royalty or tax income in the future.
- Sustainable options: We only studied options which would be sustainable over time. Thus we did not study options of paying for the deficit by drawing down funds such as the Permanent Fund earnings reserve or other smaller funds such as the Power Cost Equalization fund. Although drawing down these funds would be a potential way of paying for general fund deficits for a period of time, it would not be sustainable. Note however that using Permanent Fund earnings that are currently added to the Permanent Fund principal (as inflation proofing) or which are added to the Permanent Fund earnings *could* be sustainable—as long as the average use of these earnings over time did not result in drawing down the average balance of the earnings reserve over time.
- Options within the state's control. If oil prices or production rise, oil revenues could increase and reduce the deficit, without any of the economic impacts which would result from spending cuts, new taxes, or dividend cuts. While we can hope that oil prices and revenues increase, and while we may wish to assume some level of oil revenue increases in how we respond to the state's fiscal challenge, we cannot control whether and to what extent they will increase. Thus we did not include higher oil revenues or other potential revenues increases beyond the state's control as "fiscal options" for "reducing the deficit." Technically, increases in oil revenues would not be actions the state might take to reduce the deficit, but rather reductions in the amount by which we need to reduce the deficit.
- Options we were able to analyze: options that we had the time, funding and expertise to analyze. Thus we didn't analyze complex options such as potential changes to oil credits or oil taxes; changes to taxes on specific industries such as fishing or mining; or changes to how the state deliver services such as K-12 education, the University of Alaska or Medicaid which might affect costs and spending. These are examples of options which might significantly reduce the deficit and which are receiving significant discussion. But

they are all sufficiently complex that analyzing their potential economic impacts would require detailed and specific analysis far beyond the scope of what we had time or funding (and in some cases expertise) to analyze for this study.

We are not advocating for or against any of the fiscal options which we studied, nor are we offering any conclusions about whether they are practical or politically feasible. Our purpose is only to inform the ongoing important discussion about potential fiscal options.

Organization of this Report

Chapter II of this report discusses revenue impacts of the tax and dividend-cut fiscal options, which would affect Alaskans' incomes either by collecting taxes from them or by reducing their dividend income. We estimate how much revenue each option would collect from different ten different household income groups, both as dollar amounts and as a relative share of each group's income. We also estimate the extent to which these revenue collections would be offset by lower federal tax obligations, and the extent to which tax revenues would be collected from non-residents. Finally, we estimate the potential impacts of the changes in income associated with each option on Alaskans' spending, which drive the "multiplier" impacts on the economy discussed in Chapter III.

Chapter III discusses potential short-run economic impacts of fiscal options on income and jobs. To help in comparing options, we estimated their short-run economic impacts per \$100 million of deficit reduction.

Chapter IV briefly discusses potential regional differences in the revenue impacts and short-run economic impacts of fiscal options.

Chapter V discusses potential total impacts on the economy of reducing the deficit, and how these might be affected by how fast the deficit is reduced.

Chapter V briefly describes potential longer-term and indirect economic and social impacts of fiscal options which we did not study for this report. These other impacts are important, but they were beyond the scope of what we were able to study.

Limitations to the Analysis

It is important to recognize several limitations to the analysis reported in this study.

The devil is in the details. With the exception of dividend cuts, all of the fiscal options which we studied are "generic" options. For any spending cut or tax option, "the devil is in the details": the actual impacts would depend on specific details of how the spending cuts are made or how the taxes might be structured. Our estimates of the impacts of each fiscal option reflect specific assumptions about how the option might be implemented. If it were implemented differently, the impacts might differ.

Our ability to analyze impacts of spending cuts is limited by uncertainty about how they would be implemented. The potential economic impacts of spending cuts depend greatly on what would be cut. Some kinds of spending cuts would have much greater impacts than other kinds of cuts. We analyzed four “generic” spending cut options for the purpose of contrasting the impacts of different kinds of cuts, ranging from those that might have the highest economic impacts (cuts to the state workforce or state worker pay) to cuts that would have lower economic impacts (broad based cuts or cuts to capital spending). None of these generic spending cut options’ impacts are necessarily representative of the actual economic impacts of specific cuts which might be characterized using the same names. Nor are they necessarily feasible for large-scale cuts. For example, the FY16 capital budget is only \$118 million, so a (hypothetical) \$500 million cut to state capital spending would not be possible.

Our ability to analyze impacts is limited by available data. Analyzing how much different fiscal options might contribute to reducing the deficit and what the impacts on Alaskans and the Alaska economy requires many assumptions about factors such as incomes of residents and non-residents, how much non-residents spend in Alaska for different kinds of products, marginal federal tax rates that they pay, how they spend money and how their spending might change in response to changes in their incomes. We developed assumptions based on the best available data, but in many cases data are limited or non-existent to develop necessary assumptions, so that we had to use our best judgment. As a result, some of our estimates are inherently uncertain: different reasonable assumptions would have resulted in different estimates. In general, because we used consistent assumptions for different options, we are able to be more confident in our estimates of the *relative* economic impacts of different options than in their total economic impacts. In the following chapters we discuss the most important areas of uncertainty and how different assumptions might change the report assumptions.

Our estimates of short-run impacts exclude some potential impacts. To analyze short-run economic impacts in Chapter III, we used a standard economic technique known as “economic impact modeling” and a commonly used model known as “IMPLAN.” This approach and this model are widely used in Alaska and elsewhere. The approach is the best available technique for estimating how a change in spending or income attributable to a particular industry or government policy “ripples” through the economy as a result of further changes in spending flows between industries and households. However, it does *not* account for potential behavioral adjustments in spending, wage rates, prices, or migration to and from Alaska. The best way to interpret our estimates is as immediate effects of income and jobs resulting from less money circulating in the economy.

As we discuss in Chapter VI, our analysis focused only on potential revenues impacts and short-run economic impacts of selected fiscal options. All of the options would have potential longer-term economic impacts which are harder to predict and analyze, and which we did not analyze—but which are also potentially as important or more important than the short-term economic impacts which we analyzed for this study.

Our analysis offers useful perspectives on some of the potential economic impacts of the fiscal options we studied. But our analysis is insufficient to conclude whether any option is “good” or

“bad” (or “best” or “worst”). Ultimately Alaska’s fiscal choices will significantly affect Alaska’s future economy and society in many ways beyond the short-term economic impacts which we analyzed of this study. In thinking about our fiscal options, we should consider not only their short-term economic impacts but also their longer-term economic and social impacts.

Report Funding

ISER’s preparation of this report was supported with funding from the Alaska Department of Revenue and the Office of Management and Budget. Each agency provided \$30,000 in funding.

Study Independence

As with all ISER research, this report and its conclusions are solely the work of the individual authors and should be attributed to them, not to ISER, the University of Alaska Anchorage, or the research sponsors. Neither of the funding agencies influenced the conclusions of the report. We decided what fiscal options to study, what kinds of economic impacts to study, how we studied them, and how we wrote about our conclusions.

In our study design, analysis and conclusions we are not advocating for or against any fiscal options or choices that the state may make. Our purpose is solely to help inform the important discussion occurring in Alaska about how and when to close the deficit. While we believe that the information in this report is relevant to this discussion, it is not sufficient to draw conclusions about which options the state should choose. Many other factors matter in this discussion beyond the short-term economic impacts which we analyzed—including value choices about what kind of economy and society Alaskans wish to have.

Our findings and conclusions are limited to those in this report and presentations which we have prepared. We are not advocating for or against any fiscal options or choices, and we have attempted to describe and emphasize the limitation to our analysis. Other people may argue for or against fiscal options or choices based on their interpretations of our findings, and/or may not acknowledge the limitations to our analysis. We have no control over how other people interpret or use our findings: what they say we said is not necessarily what we said.

Study Authors

Gunnar Knapp directed this research and led the analysis and writing for Chapters I, IV and V. Matt Berman led the analysis of revenue impacts reported in Chapter II and Appendixes A and B. Mouhcine Guettabi led the analysis of short-run economic impacts reported in Chapter III and Appendixes C and D. Technical questions about the analysis should be directed to the lead authors at Gunnar.Knapp@uaa.alaska.edu, Matthew.Berman@uaa.alaska.edu, and mguettabi@alaska.edu.

II. REVENUE IMPACTS OF TAXES AND DIVIDEND CUTS

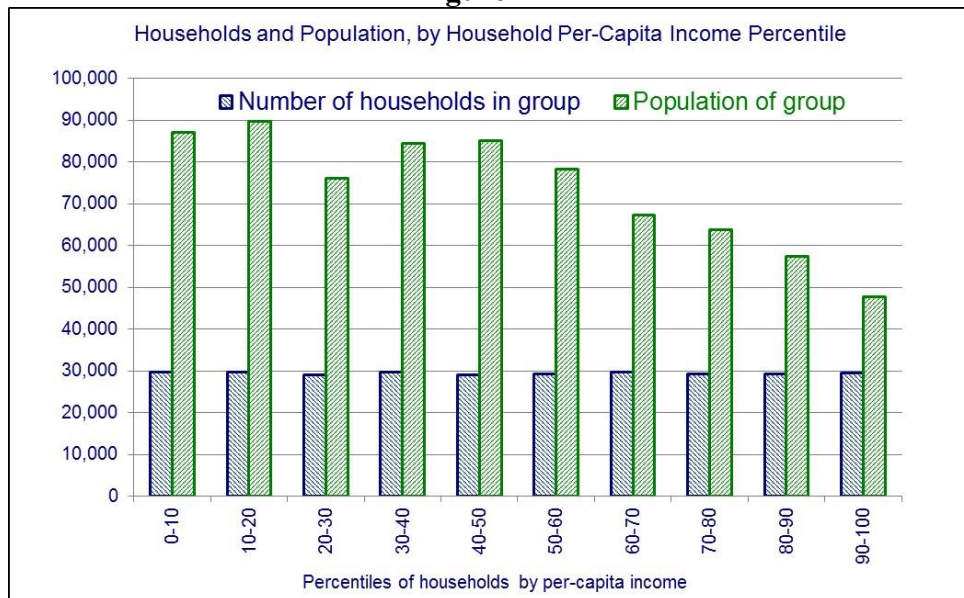
In this chapter we discuss potential revenue impacts of tax and dividend cut options, including the relative shares of revenues they would raise from different Alaska income groups and from non-residents, as well as the extent to which they would be offset by reductions in federal taxes paid by Alaskans. This chapter summarizes our results. Appendix A provides technical details of the methodology and results

All measures to raise revenues from households through dividend cuts or taxes will have some adverse effect on the economy, because taking money out of the private economy reduces the amount that households can spend. However, the amount that a given revenue measure affects spending per dollar of revenue raised differs for different measures. Three main factors explain the differences in expenditure effects among the various measures. These are (1) the share of revenues contributed by non-residents, (2) the share revenues offset by reductions in federal taxes, and (3) the distribution of the impact of the revenue measure on different income groups. A fiscal measure is considered *progressive* if the percentage collected rises as income rises, and *regressive* if the percentage collected falls as income rises. Lower-income Alaskans typically spend a higher share of their income than higher income Alaskans, so more regressive measures will have a larger adverse effect on expenditures than less regressive or progressive measures.

Alaska Income Distribution

To analyze how taxes and dividend cuts might differently affect Alaskans with different income levels, we divided Alaska households into ten groups based on their per-capita income using U.S. Census data for 2014, the latest year available. Each group represents about 29,000 households, but as the Figure II-1 shows, households with higher per-capita income have fewer household members on average than lower-income households.

Figure II-1



Income in the 2014 Census data represents income earned in 2013. The richest ten percent of households earned over \$200,000 that year, while the poorest ten percent earned less than \$14,000 (Figure II-2). The top ten percent of households accounted for 21 percent of all personal income, only a little less than the bottom 50 percent of households combined (Figure II-3). Census income includes PFD payments for everyone in the household that received a dividend. It also includes cash public assistance, but not food stamps or any other non-cash benefits. Income distribution in Alaska has become more inequitable over the past 25 years, mirroring national trends. However, Alaska income distribution remains more equitable than the nation as a whole, in part due to the PFD, which plays an important role in providing an income floor for the poorest Alaska residents.

Figure II-2

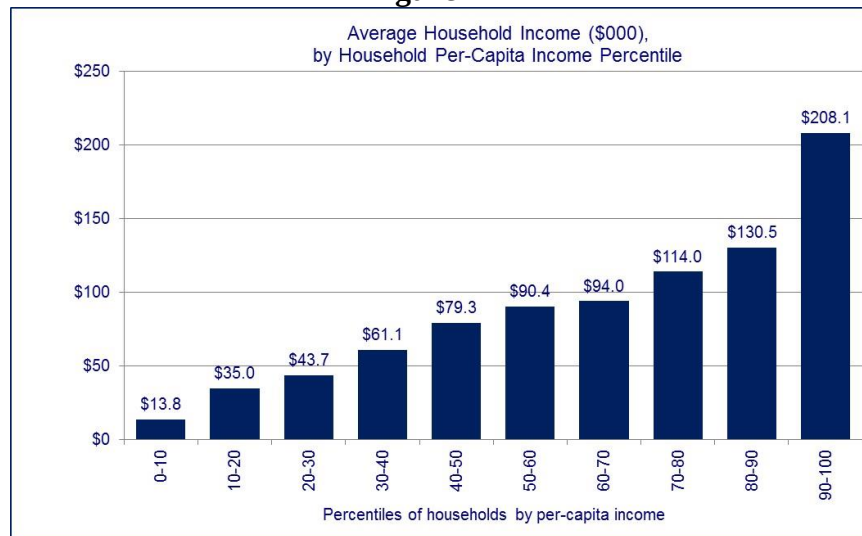


Figure II-3

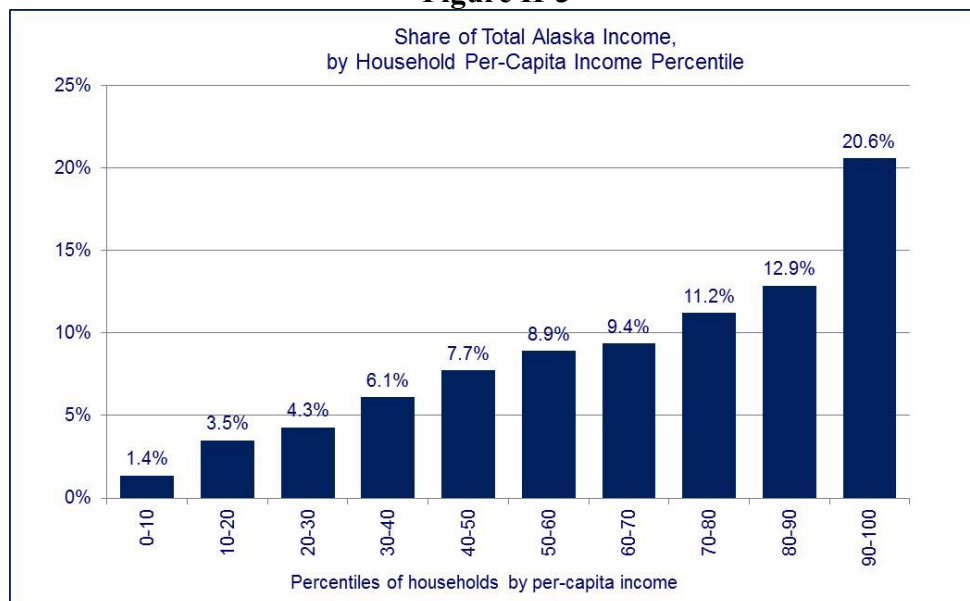


Table II-1 shows the Census estimates for population, household size and 2013 income for the ten household groups. The Alaska Permanent Fund Dividend (PFD) was \$900 in 2013. Dividends have been larger in more recent years. For comparison, the last column of Table A-1 shows what per-capita income would be if all income except for the PFD was the same as in 2013, but with a PFD of \$2,000.

Table II-1
Alaska Population, Persons per Household, and Per-capita Income
by Per-capita Household Income Percentile.

Income percentile, households	Population	Average persons per household	Per-capita income in 2013	Per-capita income with \$2,000 PFD ^a
Lowest 10 percent of households	87,006	2.94	\$ 3,594	\$ 4,694
10-20th percentile	89,660	3.03	10,465	11,565
20-30th percentile	76,040	2.62	15,613	16,713
30-40th percentile	84,404	2.84	20,412	21,512
40-50th percentile	85,077	2.93	25,935	27,035
50-60th percentile	78,178	2.66	32,818	33,918
60-70th percentile	67,327	2.27	40,265	41,365
70-80th percentile	63,722	2.18	51,154	52,254
80-90th percentile	57,284	1.95	65,707	66,807
Highest 10 percent of households	47,771	1.63	126,890	127,990
All residents	736,471	2.51	\$ 39,246	\$ 40,346

Non-Resident Workers and Visitors

In addition to the 736 thousand Alaska residents the Census Bureau estimated for 2013, the Alaska Department of Labor reported 86 thousand non-residents were employed in Alaska and earned an average of nearly \$28,000 per worker. It should be noted that this figure understates the total number of non-resident workers, as it does not include federal government employees including active-duty military personnel, or self-employed individuals.

Non-resident workers spend money in Alaska while they are working. Most non-resident workers have temporary or permanent homes in Alaska and spend part of the income in the state, generating additional economic activity. In addition to non-resident workers, visitors to the state also spend money in Alaska on many different items. The amount that non-resident workers and visitors might contribute to state revenues will vary by the type of revenue. Income taxes can be structured to include wages of non-resident workers in the tax base. Sales taxes collect money from visitors as well as non-resident workers.

Potential Revenues from Fiscal Options

To analyze the effects of potential revenue options, we examined five specific potential broad-based fiscal measures that can be imposed at different rates to raise varying amounts of revenue. For the analysis, we examined hypothetical options of a similar scale: each measure was designed to raise \$350-\$400 million annually:

- Two percent flat rate income tax;
- Ten percent federal income tax surcharge;
- A \$600 reduction in the annual PFD;
- Four percent sales tax excluding food at home, health care, shelter, and education;
- Three percent sales tax including food at home and shelter, excluding education and health care.

In addition to these five measures, we also analyzed the effects of a potential state property tax. We assumed that property taxes levied by local governments would be credited from the state tax, analogous to the way that the state credits local governments in the existing state petroleum property tax. This makes it more difficult to scale than the other broad-based measures. The state of Alaska taxes petroleum property at a rate of 20 mils, or 2 percent. The highest local property tax rate in Alaska is also currently at 20 mils (Valdez). Consequently, we examined the potential effects of a 20 mil, or 2 percent state property tax with a credit for taxes paid to local governments.

To estimate revenue from income taxes, we relied on data from the Internal Revenue Service on the amount Alaska taxpayers at different income levels and filing status paid in federal individual income taxes. We assumed that wages of non-residents would be taxed at the same average tax rates as residents.

Estimating revenue from sales taxes requires information on retail expenditures. The national Consumer Expenditure Survey provides detailed data on expenditures for residents of all states, including Alaska. Data on retail expenditures by non-residents is severely limited. We estimated that non-resident spend money in Alaska on living expenses in proportion to their share of total state wages. Using data on seasonal patterns of state alcohol taxes and local sales taxes, we estimated that 15 percent of commodities and 10 percent of services were purchased by non-residents. It should be noted that these are generous estimates of non-resident expenditures. The true figures are unlikely to be higher than these estimates and could be somewhat lower.

We estimated property tax revenues based on the “full and true value” of real and personal property as determined by the Alaska State Assessor’s office. We adjusted the state tax base for property located outside the boundaries of taxing jurisdictions based on Census data. It should be noted that almost all the value of potentially taxable property except for a portion of the Trans-Alaska Pipeline (already taxed by the state) is located within areas already subject to local property taxation. Property owned by non-resident households and businesses is included in the tax base. Estimates of the share of property tax revenues contributed by non-residents highly uncertain, since information on non-resident property ownership is not systematically available.

We estimate non-residents would contribute at least 2.8 percent of property taxes, and probably more.

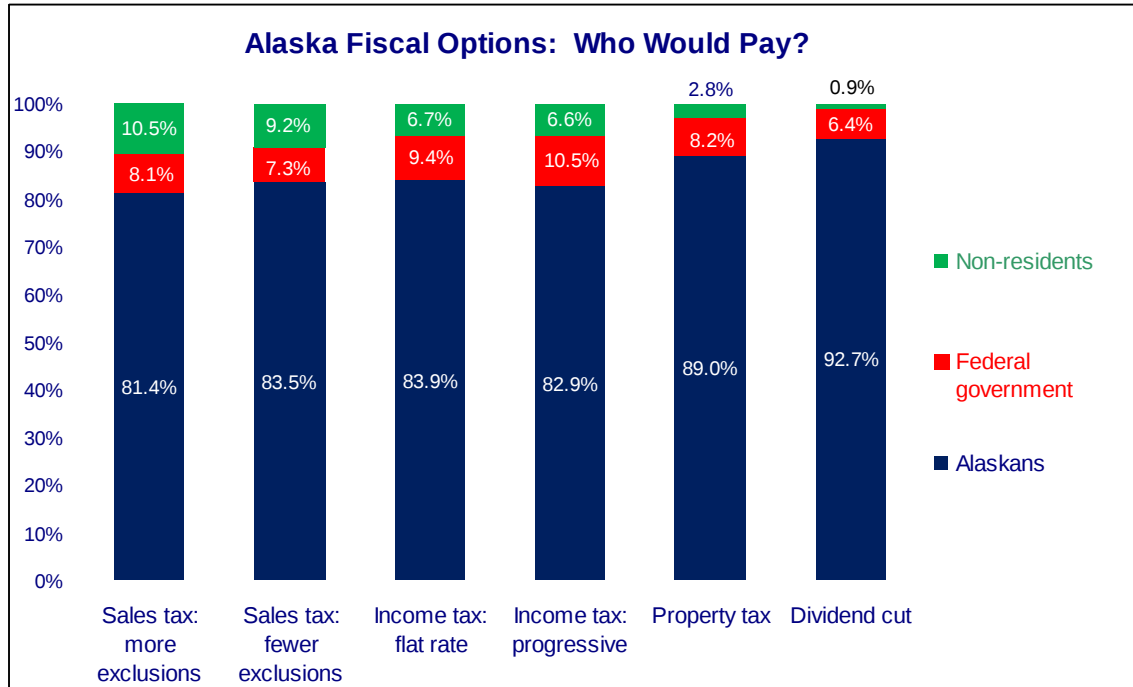
Table II-2 summarizes the total estimated revenues raised and the amounts from residents and non-residents for the five hypothetical options. As mentioned above, the PFD reduction assumes that one percent of dividends are paid to individuals who filed for the PFD as residents but for various reasons were no longer Alaska residents by the end of the year. A 20 mil property tax would collect \$1.7 billion annually. After subtracting the amount that local governments are collecting that we assume would be credited from the state tax, the residual amount is \$815 million, or about twice as much annual revenue as the other five measures would collect.

Table II-2.
Estimated Resident, Non-resident, and Total Revenues Raised
from Five Potential Revenue Measures

Revenue measure	Total revenue raised (\$ millions per year)		
	Alaska residents	Non-residents	Total, residents and non-residents
2 percent flat rate income tax	\$366	\$ 29	\$396
10 percent federal income tax surcharge	\$338	\$ 28	\$366
\$600 cut in PFD	\$380	\$ 4	\$384
4 percent sales tax excluding food at home, health care, shelter, and education	\$318	\$ 41	\$359
3 percent sales tax excluding education and health care	\$388	\$ 43	\$431
20 mil state property tax with local credit	\$ 792	\$ 23	\$815

Some of the amounts shown in Table II-2 for Alaska residents and non-residents will actually be contributed by the federal government in the form of reduced federal income taxes. One could say that the federal government “pays” for a portion of revenues from reduced PFD payments because federal income taxes will be reduced when payments fall for most taxpayers. Alaska taxpayers itemizing deductions can also deduct property taxes and either state income or sales taxes from federal taxable income. Based on IRS data for the percentage of taxpayers itemizing deductions and tax rates at different income levels, we estimated that the reduced federal taxes would offset between 7 and 11 percent of tax revenues collected (Figure II-4). The federal share is highest for an income tax based on a percentage of federal income taxes, and lowest for sales taxes with fewer exemptions. The share contributed by the federal government for a reduction in PFS payments is even lower.

Figure II-4



The federal share varies across the different revenue measures because higher income taxpayers are both more likely to itemized deductions – and therefore deduct the state tax from taxable income – and are taxed at higher tax rates. That is, the more regressive a revenue measure, the less that the federal government will offset revenues collected from Alaska households. We now discuss the distribution of the revenue burden among resident households.

Distribution of the Revenue Burden Among Alaska Households

Figure II-5 compares how each of the broad-based revenue measures discussed above affects per-capita disposable income—income net of taxes—for households with different levels of per-capita income. Because each revenue option raises a different amount of revenue, the numbers in Figure A-2 are normalized to show the disposable income loss per \$100 million raised. We assumed that the entire amount of property taxes assessed on rental property would be passed on to renters. Although renters might not feel the full impact of the tax immediately, the higher costs to landlords would likely get built into new rental contracts as old contracts expire.

Figure II-5

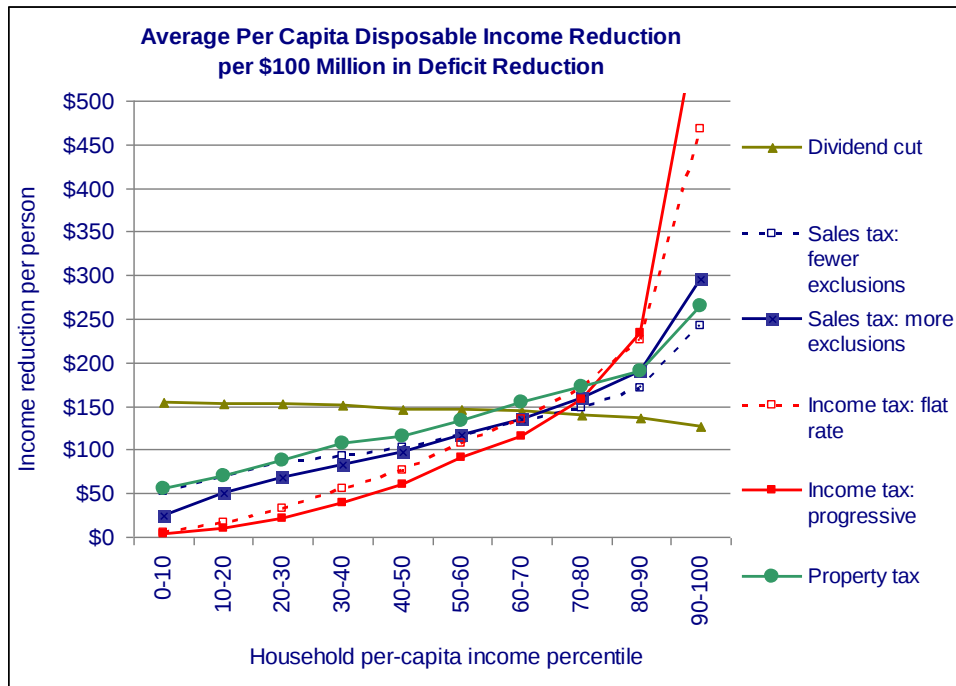
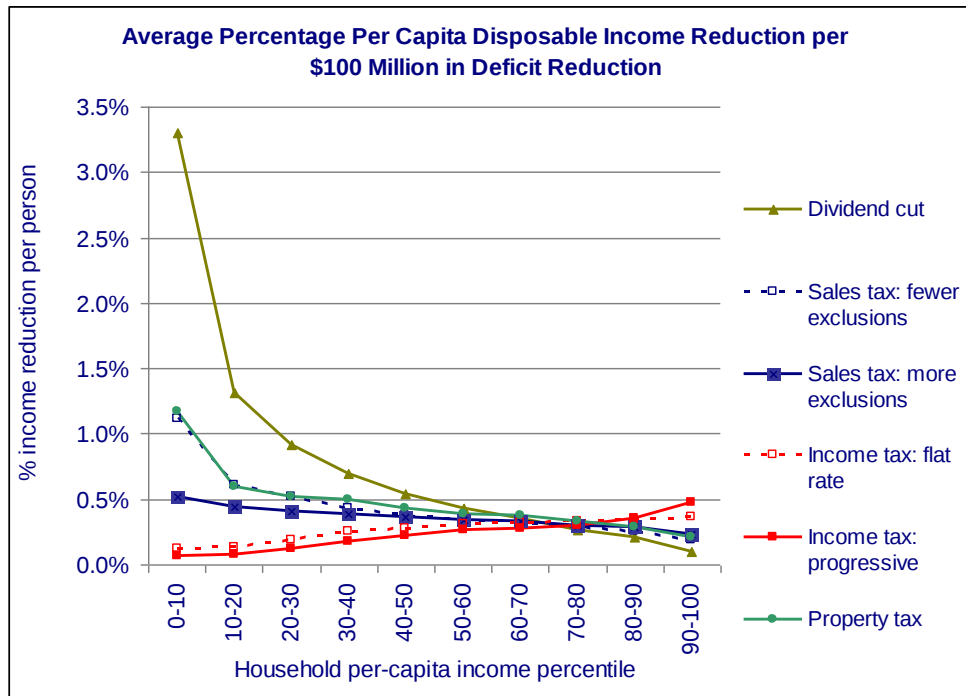


Figure II-6



Reducing the PFD by \$156 per person and diverting the revenue to state government would raise \$100 million. However, only the poorest households would actually lose the full amount. Most households get a portion of the loss of income back in reduced federal income taxes. The higher the household's per-capita income, the more the taxes are reduced; disposable income of the

richest ten percent of households would only fall on average by \$127. For all the other measures, the amount paid would rise as per-capita income rises, although in varying degrees.

The ten percent of households with the highest per-capita income would pay about five times as much as the poorest ten percent for the sales tax including food at home and shelter. They would pay about 12 times as much if the sales tax excludes food and shelter, about the same multiple as the state property tax. In contrast, the ten percent of households with the highest per-capita income would pay about 70 times as much flat rate income tax as the poorest 10 percent, and about 160 times as much with the income tax surcharge.

Property taxes paid by businesses would also almost certainly be passed on to customers. The only exception would likely be natural resource exports such as fish and minerals, where prices are set by world markets, not Alaska supply and demand. To assess the distribution of these business property taxes among Alaska households, we assumed that the property tax would add to the cost of living in proportion to non-shelter expenditures.

Figure II-6 shows how the various fiscal measures would reduce disposable income for households for different per-capita income percentiles. The figure shows that the 2 percent flat rate income tax is progressive at lower income scales, due to the fixed exemptions and deductions for the tax base: federal taxable income. The 10 percent income tax surcharge is more progressive, following the progressive structure of the federal income tax. Even with the progressive rates, the income tax surcharge would reduce disposable income of the richest ten percent of households by less than 0.4 percent per \$100 million raised.

In contrast to the income tax measures, the other fiscal options are quite regressive. The three percent sales tax option has lower rate but a broader base than the four percent option. The two types of expenditures excluded in the four percent tax -- food at home and shelter -- vary much less with income than do expenditures for other goods and services. In fact, because the shelter category includes rent but excludes payments for owner-occupied housing, and higher income households are much more likely to own their homes, there is very little variation in shelter expenditures across the different income percentiles. This makes sales taxes more regressive if they include food and shelter in the tax base. Non-residents also purchase less food at home and shelter relative to residents than they purchase other potentially taxable goods and services.

The poorest ten percent would lose 1.2 percent of income with the sales tax that includes food at home and shelter, while the richest 10 percent would lose only 0.2 percent of income. Even if food at home and shelter were excluded, the sales tax would still reduce disposable income of the poorest ten percent of households by twice as much as it reduced disposable income of the richest ten percent. The distribution of property taxes, as mentioned above, is very similar to the distribution of the sales tax that includes food and home and shelter. The reduction in the PFD is the most regressive of all. For every \$100 million raised with PFD cuts, the ten percent of households with the lowest income lose 3.3 percent of disposable income, while disposable income of the ten percent with the highest income falls by only 0.1 percent.

Effects of Broad-Based Revenue Measures on Household Expenditures

All the fiscal options will have some adverse effect on the economy, because they reduce disposable income. As disposable income falls, households spend less on goods and services. However, the amount that a tax increase or spending cut changes spending depends on how households react to the change in their economic circumstances, and how markets respond to the changes in household behavior. Because we do not know how households and markets will react, our estimates of economic impacts are uncertain. We address the uncertainty by analyzing two scenarios, each based on a set of assumptions about how taxes and dividend cuts affect household purchasing power (disposable income) and about how changes in disposable income affect spending.

The IMPLAN input-output model used to estimate the indirect (multiplier) effects of changes in spending, discussed in Chapter III, has a set of embedded assumptions about income and spending. IMPLAN cannot distinguish income of residents from that of non-resident workers, nor does it distinguish spending of residents vs. visitors, we use the Census income data to represent the distribution of the effects of revenue measures. IMPLAN also assumes that all changes in the economy are proportional to changes in spending. This means that the model cannot account for people adjusting their household spending patterns when their incomes change; for example, eating more meals at home rather than dining out. Consequently, estimates of expenditure changes from IMPLAN are likely to be larger than will actually take place. IMPLAN also includes non-cash benefits that households receive from employers and governments such as employer-provided health insurance and food stamps, while the Census includes only cash income. These non-cash benefits do increase household purchasing power and contribute to the economy, so leaving them out could potentially underestimate the economic impacts.

Because it is not possible to reconcile the two data sources, we address the uncertainty in potential economic impacts by estimate two sets of impacts, based on two sets of assumptions tied to the different data sources. Since the assumptions embedded in the IMPLAN model generally results in higher estimated impacts, we call the estimates based on IMPLAN expenditure changes the “high” scenario, and the estimates based on Census data the “low” scenario. Table II-3 summarizes the assumptions about income and spending for the low and high scenarios. We present the projected expenditure changes of the six revenue measures in this chapter. Chapter III, which discusses economic impacts using the IMPLAN model, also discusses the expenditure effects in the high scenario.

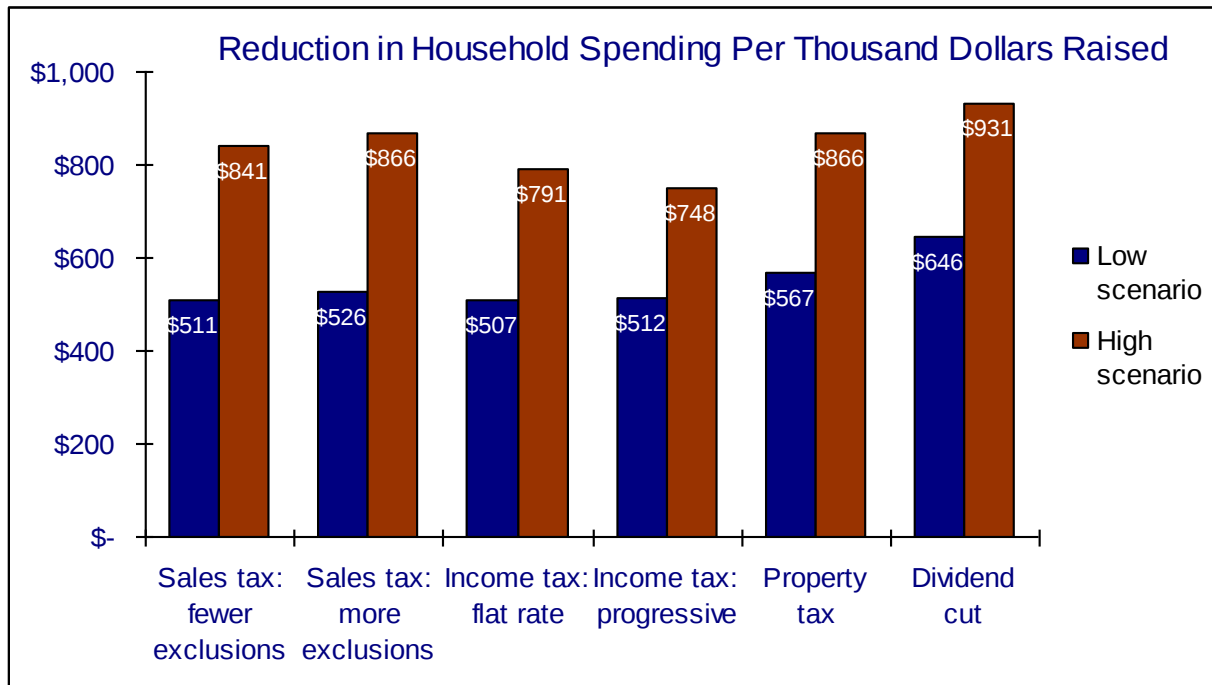
Table II-3.
**Summary of Assumptions About Income and Spending for Two Methods of Estimating
Economic Impacts of Spending Cuts and Revenue Measures**

Assumption	High	Low
<i>Income driving spending patterns includes</i>		
Wages and salaries	x	x
Proprietors' income	x	x
Rent, interest, and dividends	x	x
Employer-paid job benefits	x	
In-kind assistance such as food stamps	x	
Rent homeowners avoid by owning their dwellings	x	
<i>Spending patterns driving economic impacts</i>		
Spending changes in proportion to income	x	
Spending patterns differ between residents and non-residents		x
Resident households adjust spending patterns with income		x
Loan payments change in proportion to income	x	
Loan payments assumed fixed in short term		x
Change in housing prices considered part of spending change	x	
Change in housing prices ignored (benefits cancel out costs)		x

Figure II-7 summarizes the amount that each of the six fiscal options would reduce household expenditures per thousand dollars of revenue raised, based on the low and high scenario assumptions. Appendixes A and C contain a detailed explanation of the methods. Income taxes have the least effect on expenditures. The PFD cut has the largest effect – about \$0.65 reduction in expenditures per dollar of revenue raised in the low scenario and \$0.93 in the high scenario. This difference between income taxes and PFD cuts is directly related to the distribution of the effects. The PFD reduces disposable income much more for lower-income households than the income tax, and lower-income households spend a much higher share of their income than higher-income households.

The estimated relative effects of sales taxes and the property tax on household spending differ for the two scenarios. The low scenario takes into account the higher proportion of sales taxes than property taxes paid by non-residents. The lower contribution of non-residents leads to a higher estimated adverse effect for property taxes on household spending. For the high scenario, which does not distinguish between resident and non-resident spending, the property tax and sales taxes have similar effects.

Figure II-7



Increases in Excise Taxes on Alcohol, Tobacco, and Petroleum Fuels

In addition to the six broad-based revenue measures discussed above, we also considered potential revenues and effects on households and the economy of potential increases in excise taxes. Alaska already levies excise taxes on petroleum fuels, alcoholic beverages, and tobacco products. The state could raise additional revenues by increasing the tax rates on these products. For the most part, increased excise taxes would have similar effects on the economy per dollar of revenue raised as general sales taxes. However, the distribution of the effects on household disposable income would differ from that of general sales taxes.

Alaska taxes petroleum fuels at different rates depending on the type of fuel. Motor fuels are taxed at a rate of \$0.0895 per gallon, marine fuels at \$0.05 per gallon, aviation gasoline at \$0.047 and jet fuel at \$0.032 per gallon. The \$0.0895 per gallon highway rate includes a surcharge of \$0.95 cents per gallon effective July 1, 2015. Commercial enterprises pay a substantial portion of motor fuel taxes. In Fiscal Year 2015, the state collected \$42 million from fuel taxes, and will likely collect \$45 million in 2016 with the surcharge in effect. Even with the surcharge, Alaska fuel taxes are the lowest in the nation. According to data from the American Petroleum Institute, and trade organization, Alaska would have to increase its fuel taxes by about \$17.50 per gallon to bring its fuel tax rates to the national average. Such an increase would provide an estimated \$87 million per year of additional revenue.

The justification often made for levying excise taxes on transportation fuels is that it is a user fee to allow the state to recover its cost of operating, maintaining, and upgrading state highways, harbors, and airports. The federal gasoline tax is specifically earmarked for the Highway Trust Fund, which pays for highway and other surface transportation infrastructure. In Alaska, the

current state budget for the portion of the Department of Transportation and Public Facilities dealing with transportation facilities exceeds \$200 million. Even if Alaska raised fuel taxes to the national average rates, the total fuel taxes paid of \$133 million would still fall far short of what it actually costs to maintain Alaska's transportation infrastructure, let alone the state's share of new highway construction and port expansion. In order to cover the state's actual share of the costs of maintaining and improving Alaska's transportation infrastructure, the motor fuels tax would have to increase by a factor of five.

Although gasoline taxes are considered regressive nationally, Alaska appears to be different. Data from the Consumer Expenditure Survey suggest that fuel expenditures are roughly proportional to per-capita household income, although fuel purchases vary greatly among households. In Alaska, higher income households are more likely to own and use recreational vehicles, boats, and airplanes, as well as drive less fuel-efficient luxury vehicles. Rural Alaska households with lower incomes use gasoline for snow machines, boats, and all-terrain vehicles, but generally use less fuel than urban households. In Alaska at least, it does not appear that gasoline taxes would place a higher burden on low income households. Given the pattern of fuel use in Alaska, the low current state tax rates, and the cost of maintaining the state's transportation infrastructure, raising motor fuels taxes should be considered a relatively high priority for revenue enhancement.

Current tax rates on alcohol are based on a rate of \$0.10 per drink, which translates to \$1.07 per gallon for beer, \$2.50 per gallon for wine, and \$12.80 per gallon for hard liquor. Small breweries get a substantial tax reduction. The state alcohol tax raises about \$38 million per year, of which \$19 million comes from liquor sales, \$6 million from wine, and the remainder from beer.

Raising the alcohol tax rate to \$0.25 per drink would likely bring in about \$55 million more revenue. Although no solid data exist for Alaska, the tax is presumed to be quite regressive, as it seems unreasonable to expect that total alcohol consumption would rise proportionately as income rises. That means that the burden of the additional tax would fall more heavily on lower income households. On the other hand, consumer expenditure survey data for Alaska show that higher income households spend a greater proportion of their income on alcohol than lower income households. The explanation for this apparent contradiction is likely related to how higher income households purchase the product. More affluent households would be much more likely to purchase wine and beer in restaurants, for example, where the retail price is much higher per drink than in liquor stores. This finding suggests that the state could avoid imposing an undue burden on lower-income households by considering changing the alcohol tax from a constant amount per unit of alcohol to an "ad valorem" tax; that is, a tax based on a constant percentage of the retail alcohol price.

Alaska levies tobacco taxes at a rate based on a tax of \$2.00 per pack of cigarettes. Tobacco taxes collected \$65 million in 2015. The amount collected has been declining in recent years. Only about one in five Alaska households in the Consumer Expenditure Survey reported spending any money on tobacco products, and the amount those households do spend on tobacco purchases is not correlated with income. The downward trend of tax collections is partly due to the decline in tobacco use, but is also likely related to increased internet sales and other means

that avoid paying Alaska's relatively high tax. Raising tobacco taxes would only increase the incentive for tobacco users to find ways to avoid the tax, and therefore would not necessarily lead to higher state revenues being collected. This problem, coupled with the fact that tobacco taxes are highly regressive, suggests that increased tobacco taxes are not a promising strategy for reducing the state budget deficit.

III. SHORT-RUN ECONOMIC IMPACTS OF FISCAL OPTIONS

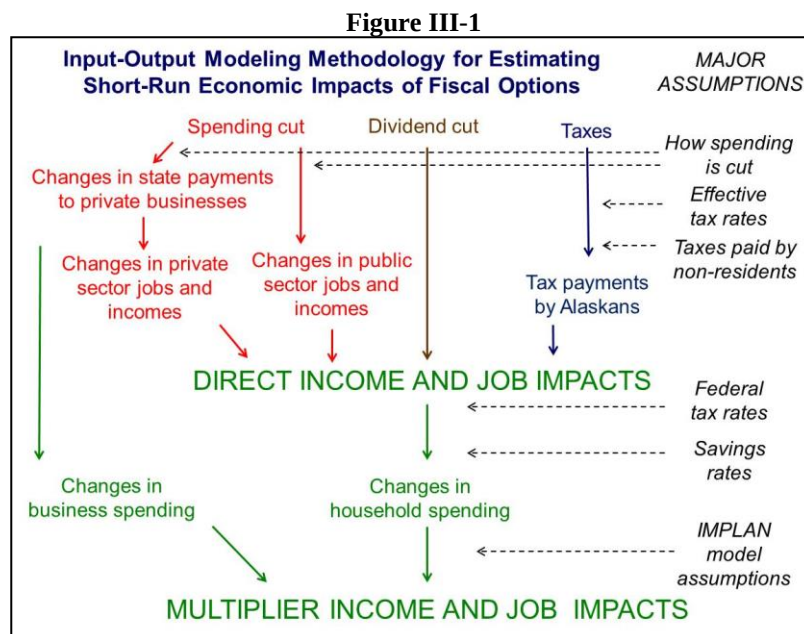
In this chapter we discuss our estimates of the short-run economic impacts of fiscal options on income and jobs. Appendix D provides technical details of the methodology and results.

To help in comparing options, we report estimated short-run economic impacts per \$100 million of deficit reduction. The estimated short-run economic impacts of an option which would reduce the deficit by a greater or lesser amount can be calculated by scaling these estimates up or down. For example, the estimated economic impacts of an income tax which raises \$200 million in new revenues would be twice the estimated impacts reported in this chapter.

Overview of Methodology

To compare short-run economic impacts of different fiscal options, we used a standard economic technique known as “economic impact modeling” and a commonly used model known as “IMPLAN.” As illustrated by Figure III-1, we began by estimating the “direct” income impacts of the fiscal options which result from the initial resulting changes in payments to and/or income of Alaska households and businesses, and the corresponding “direct” impacts on jobs of public sector and private sector workers resulting from spending cuts (but not from dividend cuts or taxes).

Next we estimated how the direct income impacts would affect spending by businesses and households. These changes in spending generate further “multiplier” impacts on income and jobs as “ripple” effects of reduced payments throughout the economy.



As shown on the right-hand side of Figure III-1, five types of assumptions are particularly important for our analysis of short-run economic impacts:

- For the spending cut options, how spending is cut. This affects both the absolute and relative direct impacts of the cuts on private sector and public sector income and jobs.
- For the tax options, the effective tax rates paid by Alaskans of different income groups, and the share of taxes paid by non-residents.
- The marginal federal tax rates of Alaskans experiencing direct income impacts. These affect the extent to which direct income impacts are partially offset by reduced federal tax obligations.
- The marginal savings rates of Alaskans experiencing direct income impacts, or the extent to which they would respond to reductions in income by reducing savings or by reducing spending. These marginal savings rates, which directly drive our estimates of multiplier impacts, are the most difficult to estimate and the greatest source of uncertainty in our estimates of short-run economic impacts.
- The numerous assumptions embedded in the IMPLAN model about the extent to which payments to households and businesses in different sectors result in further payments to households and businesses in different sectors, all of which cumulatively result in the estimated multiplier impacts on income and jobs.

As discussed in Chapter II, we analyzed two scenarios for how fiscal options might affect household spending, based on different assumptions estimated from different data sources. We refer to these as the “high” scenario (based on assumptions embedded in the IMPLAN model) and the “low” scenario (based on assumptions estimated from Census income data). The “high” scenario assumptions generally result in higher estimated impacts of the fiscal options on Alaska household spending and correspondingly higher multiplier economic impacts than the “low” scenario options. In the following discussion, we first discuss the estimated impacts for “high” scenario. We then discuss the estimated impacts for the “low” scenario.

High Scenario Short-Run Economic Impact Estimates

Table III-1 summarizes our estimates of the short-run economic impacts of fiscal options per \$100 million of deficit reduction under the high scenario expenditure impact assumptions. Below we discuss in turn the estimated direct income impacts, multiplier and total income impacts, and employment impacts. Note first, however, that the “saving less” option has no short-run economic impacts: saving less of the state’s annual Permanent Fund earnings would not result in any short-term changes in income or employment.

Table III-1
Estimated Short-Run Economic Impacts of Selected Fiscal Options
Per \$100 Million of Deficit Reduction (High Scenario)

Option	Income Impacts (millions of \$ of income)				Employment Impacts (FTE jobs in Alaska)		
	Direct earned	Direct other	Multiplier	Total	Direct	Multiplier	Total
Spending cut: workers	95		43	138	962	715	1677
Spending cut: broad-based	67		48	115	504	754	1260
Spending cut: capital	42		22	64	506	425	931
Spending cut: pay	100		43	143	0	727	727
Income tax: progressive		93	45	138	0	786	786
Income tax: flat rate		93	46	138	0	798	798
Sales tax: more exclusions		89	44	133	0	775	775
Sales tax: fewer exclusions		90	45	135	0	795	795
Property tax		97	48	146	0	854	854
Dividend cut		99	50	149	0	892	892
Saving less				0			0

Direct Income Impacts

We divide direct income impacts into two types. *Direct earned* income impacts result from reduced earnings of public or private sector workers as a direct result of cuts to government spending. *Direct other* income impacts result from reductions in household disposable income due to state taxes or reductions in dividend payments.

The four generic spending cut options illustrate the potential range of direct earned income impacts of spending cuts. If spending cuts were entirely to the pay of state workers, then a \$100 million cut to state spending would directly reduce income earned in Alaska by \$100 million. If spending cuts were achieved by reducing the state workforce, then (for our assumed generic option) the direct earned income impact would be slightly less (\$95 million), because some of

the spending cut would be to other costs associated with state workers, such as the costs of office space.

If spending cuts were achieved through broad-based cuts or cuts to the capital budget, the direct earned income impacts might be significantly lower, because relatively less of the cuts would be to payments to state or contractor workers, and relatively more would be to payments for other costs such as energy, supplies, and construction materials. Note that the direct income impacts which we assume for “broad-based” spending cuts (\$67 million) and “capital spending” cuts (\$42 million) are illustrative amounts for the particular generic scenarios we analyzed: the direct income impacts might differ for any actual “broad based” spending cut or “capital” spending cut.

The direct other income impacts assumed for the tax and dividend cuts reflect our estimates from Chapter II (Figure II-4) of the share of taxes and dividend cuts which would be paid by non-residents. For the income and sales tax options, the non-resident share ranges from 9% to 11%, so the corresponding “direct other” income impacts vary from 93% to 89%. For the property tax option, the non-resident share is a lower 3%. For the dividend option, we assume that a small share of Alaskans (about 1%) leave the state each year after receiving dividends, and thus become non-residents, so that a \$100 million cut to dividend payments reduce the income of “Alaskans” by \$99 million rather than by \$100 million.

In general, the fact that between 7% and 11% of sales and income taxes would be paid by non-residents means that both the direct income and job impacts as well as the resulting multiplier income and job impacts would be lower for these tax options than for the property tax and dividend cut options, for which Alaska residents would experience almost the entire loss of income.

Multiplier and Total Income Impacts

Multiplier income impacts are additional changes in income caused by the direct income impacts as a result of changes in the spending of households (known as induced impacts) and changes in spending of businesses (known as indirect impacts). Total income impacts are the sum of direct income impacts and multiplier income impacts.

Our estimates of multiplier income impacts are driven by our assumptions about how direct income impacts result in changes in household expenditures as well as by the numerous IMPLAN model assumptions about the allocation of household and business expenditures among different industries and households. These combined assumptions result in the implicit “income multipliers” shown in Table III-2.

Table III-2
Implicit Income Multipliers for Fiscal Options (“High Scenario”)

	Ratio of multiplier income impacts to direct income impacts	Ratio of total income impacts to direct income impacts
Spending cut: workers	0.45	1.45
Spending cut: broad-based	0.71	1.71
Spending cut: capital	0.53	1.53
Spending cut: pay	0.43	1.43
Income tax: progressive	0.49	1.49
Income tax: flat rate	0.49	1.49
Sales tax: more exclusions	0.50	1.50
Sales tax: fewer exclusions	0.50	1.50
Property tax	0.50	1.50
Dividend cut	0.50	1.50

The implicit income multipliers are almost the same for the six tax and dividend cut options (about 0.50), reflecting the fact that we assumed that direct income impacts would have proportionally similar impacts on expenditures for these options.

In contrast, the implicit income multipliers vary for the four spending cut options. For the “worker” and “pay” spending cut options, the variation in part reflects differences in the assumed income distribution of state workers that would be affected by these options from the broader income distribution of Alaska households which would be affected by the tax and dividend cut options. For the “broad-based” and “capital” spending cut options, the variation in part is because some of the multiplier impacts would be indirect impacts caused by changes in spending by businesses directly impacted by changes in state spending.

Of all the fiscal options, estimated total income impacts are greatest for dividend cut option. This is because dividend cuts would directly reduce Alaskans’ incomes by more than the tax options (because taxes would be partly paid by non-residents) or the worker, broad-based and capital spending cut options (which would only partly occur as direct reductions to household incomes). Although the “pay” spending cut option results in a similar direct income impact, the total impact is lower than for the dividend cut option because a higher share of dividend cuts would be from lower income households for whom the expenditure impacts would be greater.

Job Impacts

As shown in the top three rows of Table III-1, only the “workers,” “broad-based” and “capital” spending cut options would have direct job impacts. The direct impacts of the other options occur only as reductions in income, but not as job losses. The direct job impacts are highest for the “workers” spending cut options because we included this generic option specifically to illustrate the impacts of spending cuts achieved entirely by reducing the state workforce.

The estimated multiplier job impacts reflect IMPLAN model assumptions about the full-time-equivalent (FTE) multiplier job impacts resulting from multiplier income impacts (Table III-3). In general, the ratio of multiplier job impacts to multiplier income impacts is similar across fiscal options, and ranges from 16 to 19 FTE multiplier job impacts per million dollars of multiplier income impacts (the differences result from differences in the relative shares of different industries in changes in estimated spending flows).

Table III-3
Multiplier FTE Job Impacts
per Million Dollars of Multiplier Income Impacts

Option	Ratio of multiplier job impacts to multiplier income impacts
Spending cut: workers	16.7
Spending cut: broad-based	15.8
Spending cut: capital	19.1
Spending cut: pay	16.8
Income tax: progressive	17.3
Income tax: flat rate	17.5
Sales tax: more exclusions	17.6
Sales tax: fewer exclusions	17.7
Property tax	17.6
Dividend cut	17.9

As shown in Table III-1, the total job impacts (direct job impacts and multiplier job impacts) are highest for the “workers” and “broad-based” spending cut options. This is because these two options reduce the number of jobs in the economy directly, while the other options reduce fewer jobs directly (the “capital” spending cut option) or remove jobs only indirectly as a result of multiplier income impacts (the “pay” spending cut option and the tax and dividend cut options.)

Low Scenario Short-Run Economic Impact Estimates

Table III-4 summarizes our estimates of the short-run economic impacts of fiscal options per \$100 million of deficit reduction under the low scenario expenditure impact assumptions. These estimates differ from the high scenario estimates because they assume, based on a different data source, that reductions in household income would result in lower reductions in household spending (but higher reductions in household savings). As a result, the estimated multiplier impacts are about one-third smaller than the high scenario multiplier impacts.

Table III-4
Estimated Short-Run Economic Impacts of Selected Fiscal Options
Per \$100 Million of Deficit Reduction (Low Scenario)

Option	Income Impacts (millions of \$ of income)				Employment Impacts (FTE jobs in Alaska)		
	Direct earned	Direct other	Multi- plier	Total	Direct	Multi- plier	Total
Spending cut: workers	95		28	123	962	464	1425
Spending cut: broad-based	67		31	98	504	489	993
Spending cut: capital	42		14	56	506	275	781
Spending cut: pay	100		28	128		471	471
Income tax: progressive			31	124		538	538
Income tax: flat rate			29	122		511	511
Sales tax: more exclusions			27	115		471	471
Sales tax: fewer exclusions			27	117		483	483
Property tax			32	129		559	559
Dividend cut			35	134		619	619
Saving less				0			0

Table III-5 (on the following page) compares the low scenario and high scenario estimates. The low scenario multiplier impacts range from 61% to 69% of the high scenario multiplier impacts. The low scenario total impacts range from 61% to 85% of the high scenario multiplier impacts. The relative ranking of impacts is almost the same, except that rankings shift slightly between some of the income and sale tax options.

Table III-5
Estimated Short-Run Economic Impacts of Selected Fiscal Options
Per \$100 Million of Deficit Reduction (Low Scenario)

Option	Income Impacts (millions of \$ of income)				Employment Impacts (FTE jobs in Alaska)		
	Direct earned	Direct other	Multi- plier	Total	Direct	Multi- plier	Total
Spending cut: workers	1.00		0.65	0.89	1.00	0.65	0.85
Spending cut: broad-based	1.00		0.65	0.85	1.00	0.65	0.79
Spending cut: capital	1.00		0.65	0.88	1.00	0.65	0.84
Spending cut: pay	1.00		0.65	0.89		0.65	0.65
Income tax: progressive		1.00	0.68	0.90		0.68	0.68
Income tax: flat rate		1.00	0.64	0.88		0.64	0.64
Sales tax: more exclusions		1.00	0.61	0.87		0.61	0.61
Sales tax: fewer exclusions		1.00	0.61	0.87		0.61	0.61
Property tax		1.00	0.65	0.89		0.65	0.65
Dividend cut		1.00	0.69	0.90		0.69	0.69

Which estimates of economic impacts are “better”? We don’t know, because we don’t have enough data about the extent to which Alaska households would react to reductions in their incomes by reducing spending or reducing their savings. Both sets of estimates are reasonable. Taken together, they suggest a range within which actual economic impacts would likely fall.

Table III-6
Estimated Total Short-Run Economic Impacts of Selected Options for Reducing the Deficit by \$100 Million:
Low and High Scenarios

Option	Income Impacts (millions of \$ of income)		Employment Impacts (FTE jobs in Alaska)	
	Low scenario	High scenario	Low scenario	High scenario
Spending cut: workers	123	138	1425	1677
Spending cut: broad-based	98	115	993	1260
Spending cut: capital	56	64	781	931
Spending cut: pay	128	143	471	727
Income tax: progressive	124	138	538	786
Income tax: flat rate	122	138	511	798
Sales tax: more exclusions	115	133	471	775
Sales tax: fewer exclusions	117	135	483	795
Property tax	129	146	559	854
Dividend cut	134	149	619	892
Saving less	0	0	0	0

Short-Run Economic Impacts of Combinations of Options

It is more likely that the deficit will be reduced through a combination of fiscal options rather than by any single option. The economic impacts of any given combination of options can be calculated as the economic impacts of the individual options weighted by their share in the total deficit reduction. Table III-7 shows the economic impacts of selected hypothetical combinations of fiscal options, per \$100 million of deficit reduction. Note that the greater the extent to which the combination of options includes options with lower economic impacts (particularly “saving less”), the lower the economic impact of the combination.

Table III-7
Examples of Ranges of Estimated Economic Impacts Per \$100 Million of Deficit Reduction
Resulting from Selected Potential Combinations of Fiscal Options

	Option	Two options						Three options				Four options
Examples of potential combinations of options	Spending cut: workers											
	Spending cut: broad-based	50%	50%		50%			33%	33%	33%		25%
	Spending cut: capital											
	Spending cut: pay											
	Income tax: progressive	50%		50%			50%	33%		33%	33%	25%
	Income tax: flat rate											
	Sales tax: more exclusions											
	Sales tax: fewer exclusions											
	Property tax											
	Dividend cut		50%	50%		50%		33%	33%		33%	25%
	Saving less				50%	50%	50%		33%	33%	33%	25%
Range of estimated impacts	Total income impact (millions of \$ of income)											
	Low scenario	111	116	129	49	67	62	119	77	74	86	89
	High scenario	127	132	143	58	74	69	134	88	84	96	101
	Total jobs impact (FTE jobs in Alaska)											
	Low scenario	765	806	578	496	309	269	716	537	510	386	537
	High scenario	1023	1076	839	630	446	393	980	717	682	560	735

Limitations of Comparative Short-Run Economic Impact Estimates

The input-output modeling approach which we used to estimate short-run economic impacts is the best available technique for estimating how a change in spending or income attributable to a particular industry or government policy “ripples” through the economy as a result of further changes in spending flows between industries and households.

However, our economic impacts estimates should be considered approximate rather than precise measures of the actual impacts that each fiscal option would have, for a number of reasons:

The spending cut assumptions are based on generic assumptions about how state spending cuts would be made; actual spending cuts might differ significantly.

The estimates do not account for potential behavioral adjustments in spending, wage rates, prices, or migration to and from Alaska. The best way to interpret our estimates is as the impacts resulting from less money circulating in the economy, but not those which might result from potential behavioral adjustments.

The estimates do not include other potential short-term and longer-term economic impacts not directly caused by changes in spending flows. These might include, for example, the economic impacts over time of reductions in state services due to spending cuts, or how investment and growth in different Alaska industries over time might be affected by new taxes. As we discuss in Chapter VI, these other economic impacts of fiscal options might be as or more important than the short-run economic impacts which we estimated—but analyzing them was well beyond the scope of what we could do for this study.

IV. REGIONAL DIFFERENCES IN IMPACTS OF FISCAL OPTIONS

Regional Differences in Revenue Impacts

There are significant regional differences in income distribution in Alaska. Figure IV-1 (on the following page) shows one of many potential measures of regional income distribution: the share of exemptions (a rough measure of population) claimed on 2013 federal income tax returns for five ranges of adjusted gross income reported on the return. The share of exemptions for returns with less than \$25,000 in adjusted gross income ranged from as high as 55% for the Kusilvak (formerly Wade Hampton) Census Area to as low as 17% for the Juneau City and Borough, with an Alaska average of 22%.

In contrast, the share of exemptions accounted for by returns with more than \$75,000 in adjusted gross income was 48% for the Juneau City and Borough and but only 9% for the Kusilvak Census area, with an Alaska average of 39%. Clearly, there would be significant differences in the relative extents to which these two census areas would be impacted by dividend cuts and income taxes.

As discussed in Chapter II, the revenue impacts of the tax and dividend cut fiscal options vary significantly by income groups. We would expect corresponding variation in revenue impacts by region: lower-income regions are likely to be impacted relatively more by dividend cuts and sales taxes, which have relatively greater impacts on lower-income groups. Higher-income regions are likely to be impacted relatively more by income taxes, which have relatively greater impacts on higher-income groups.

Regional Differences in Employment Impacts

There are also significant regional differences in Alaska in shares of different industries in employment and in wage and salary income. As shown in Figure IV-2, in 2014 the share of state government jobs in total wage and salary earnings was 28% in Juneau but less than 1% in the North Slope Borough. Clearly, Juneau would be relatively far more impacted than the North Slope Borough by cuts to state government jobs or pay.

As shown in Figure IV-3, in 2014 the share of local government jobs in total wage and salary earnings was 60% in the Wade Hampton (now Kusilvak) Census area, but only 4% in the Denali Borough. Clearly, the Wade Hampton Census Area would be relatively far more impacted than the Denali Borough by cuts to revenue sharing, K-12 education funding, or other kinds of state spending which help pay for local government.

Figure IV-1

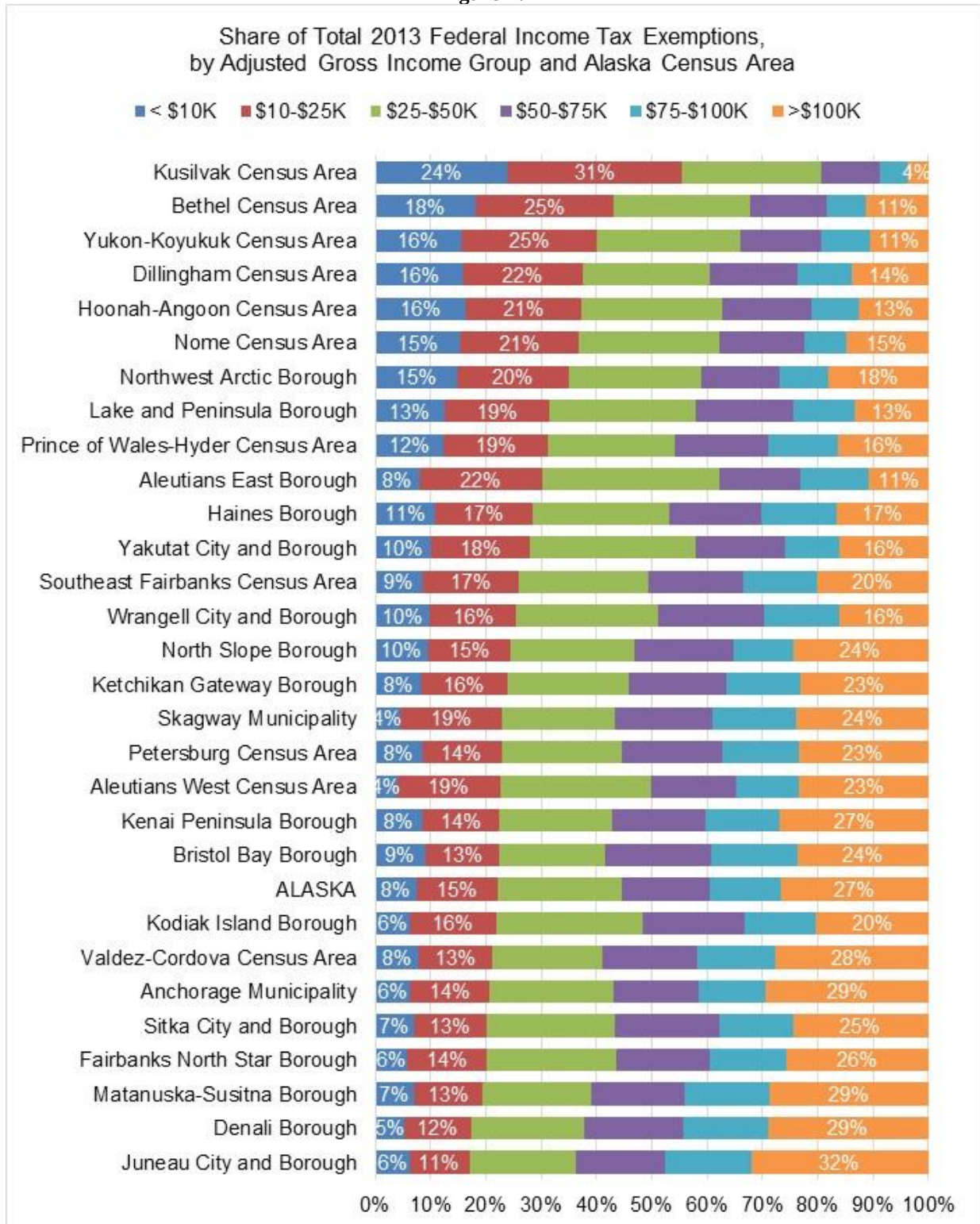


Figure IV-2

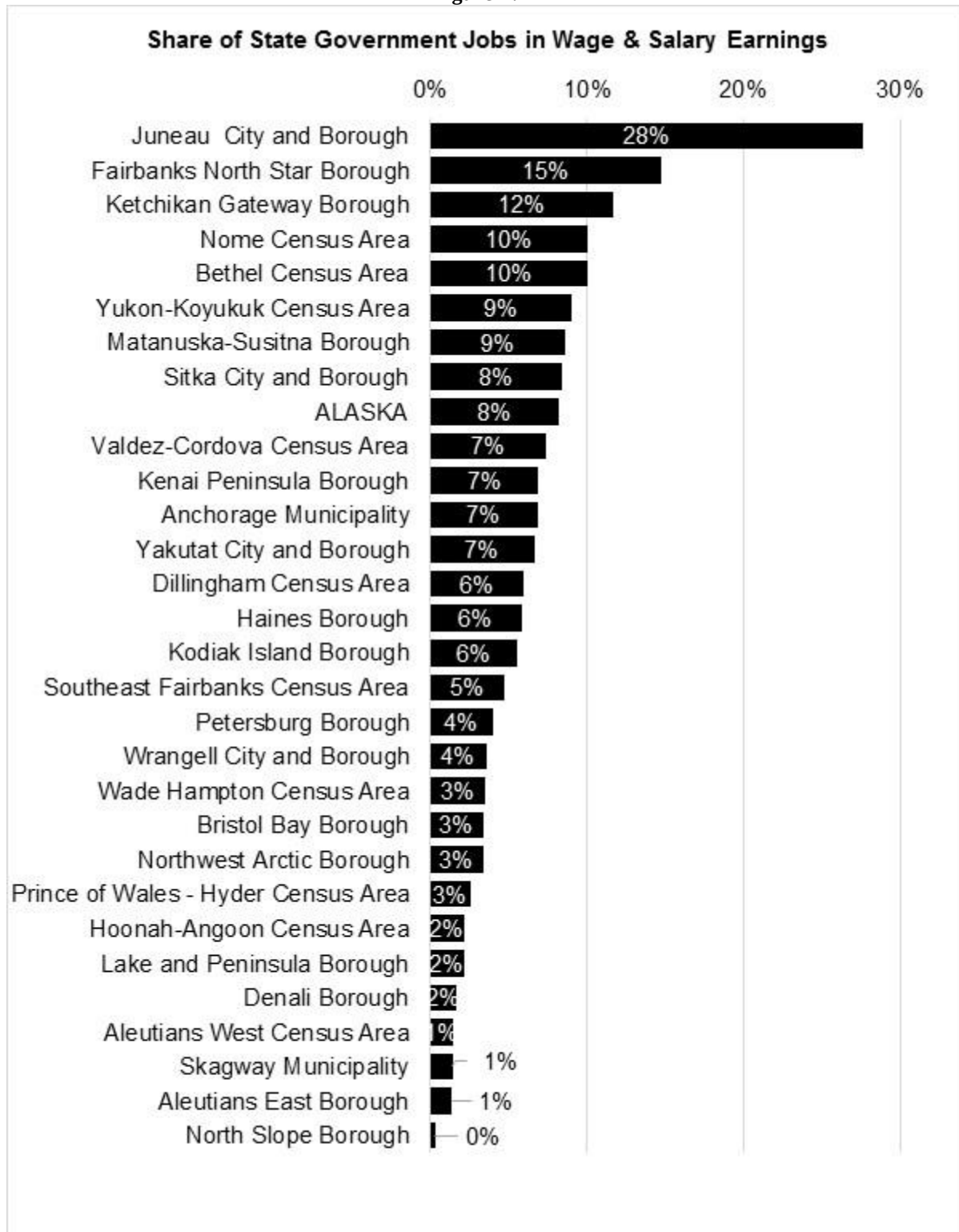
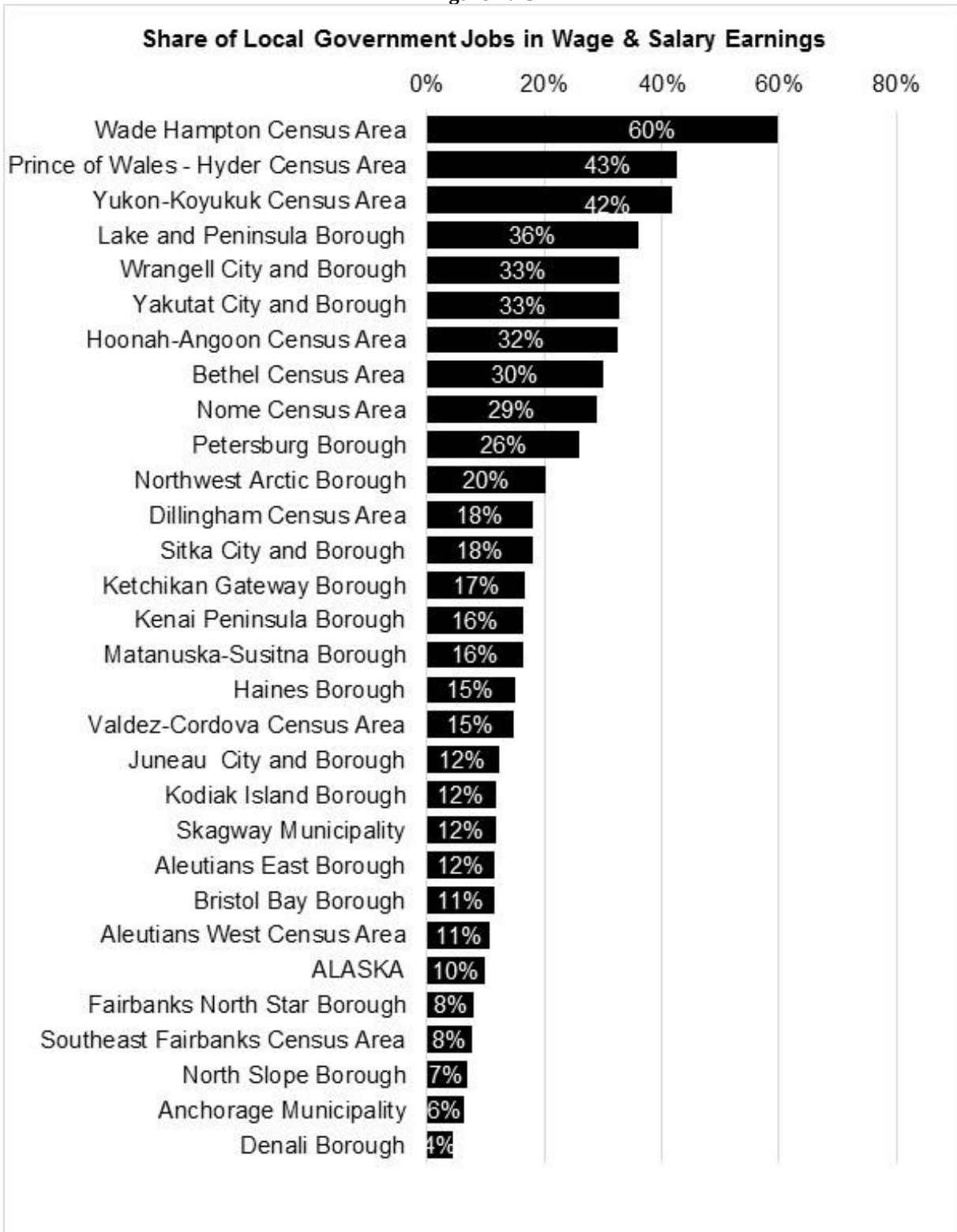


Figure IV-3



V. TOTAL ECONOMIC IMPACTS OF REDUCING THE DEFICIT

In this chapter we discuss potential total impacts on the economy of reducing the deficit, and how these might be affected by how fast the deficit is reduced.

Table V-1 shows the estimated total impacts of reducing the deficit by selected potential total amounts using selected potential combinations of fiscal options, calculated by extrapolating from the estimates in Table III-7 of the impacts of reducing the deficit by \$100 million using these options. Note that we are not arguing for or against the need to reduce the deficit by any of these amounts or in any ways. Our purpose is simply to illustrate what the estimated impacts would be of reducing the deficit by these amounts in these ways.

Table V-1

Estimated Impacts of Reducing the Deficit by Selected Total Amounts Using Different Potential Combinations of Fiscal Options

		Two options						Three options				Four options
Combinations of fiscal options	Spending cut: broad-based	50%	50%		50%			33%	33%	33%		25%
	Income tax: progressive	50%		50%			50%	33%		33%	33%	25%
	Dividend cut		50%	50%	0%	50%		33%	33%		33%	25%
	Saving less				50%	50%	50%		33%	33%	33%	25%
Estimated impacts of reducing deficit by \$100 million	Income: Low scenario	111	116	129	49	67	62	119	77	74	86	89
	Income: High scenario	127	132	143	58	74	69	134	88	84	96	101
	Jobs: Low scenario	765	806	578	496	309	269	716	537	510	386	537
	Jobs: High scenario	1,023	1,076	839	630	446	393	980	717	682	560	735
Estimated impacts of reducing deficit by \$500 million	Income: Low scenario	555	580	643	246	334	309	593	387	370	429	445
	Income: High scenario	633	660	717	288	372	345	670	440	422	478	503
	Jobs: Low scenario	3,826	4,029	2,892	2,481	1,547	1,345	3,582	2,686	2,551	1,928	2,687
	Jobs: High scenario	5,116	5,380	4,196	3,150	2,230	1,966	4,898	3,587	3,411	2,798	3,673
Estimated impacts of reducing deficit by \$1.0 billion	Income: Low scenario	1,110	1,160	1,286	492	668	618	1,185	773	740	858	889
	Income: High scenario	1,265	1,320	1,434	576	745	690	1,340	880	844	956	1,005
	Jobs: Low scenario	7,652	8,057	5,784	4,963	3,094	2,690	7,164	5,371	5,102	3,856	5,373
	Jobs: High scenario	10,232	10,761	8,393	6,300	4,461	3,932	9,795	7,174	6,821	5,595	7,346
Estimated impacts of reducing deficit by \$1.5 billion	Income: Low scenario	1,665	1,740	1,930	738	1,002	927	1,778	1,160	1,110	1,286	1,334
	Income: High scenario	1,898	1,981	2,152	864	1,117	1,035	2,010	1,320	1,265	1,434	1,508
	Jobs: Low scenario	11,479	12,086	8,676	7,444	4,641	4,034	10,747	8,057	7,652	5,784	8,060
	Jobs: High scenario	15,348	16,141	12,589	9,450	6,691	5,898	14,693	10,761	10,232	8,393	11,019
Estimated impacts of reducing deficit by \$2.0 billion	Income: Low scenario	2,220	2,320	2,573	984	1,337	1,236	2,371	1,547	1,480	1,715	1,778
	Income: High scenario	2,531	2,641	2,869	1,152	1,489	1,379	2,680	1,761	1,687	1,913	2,010
	Jobs: Low scenario	15,305	16,114	11,568	9,926	6,188	5,379	14,329	10,743	10,203	7,712	10,747
	Jobs: High scenario	20,464	21,521	16,785	12,600	8,921	7,864	19,590	14,348	13,643	11,190	14,693
Estimated impacts of reducing deficit by \$2.5 billion	Income: Low scenario							2,964	1,933	1,850	2,144	2,223
	Income: High scenario							3,350	2,201	2,109	2,391	2,513
	Jobs: Low scenario							17,911	13,428	12,754	9,640	13,433
	Jobs: High scenario							24,488	17,934	17,053	13,988	18,366
Estimated impacts of reducing deficit by \$3.0 billion	Income: Low scenario							3,556	2,320	2,220	2,573	2,667
	Income: High scenario							4,020	2,641	2,531	2,869	3,015
	Jobs: Low scenario							21,493	16,114	15,305	11,568	16,120
	Jobs: High scenario							29,385	21,521	20,464	16,785	22,039

Note: Units for income impacts are millions of dollars. Units for job impacts are FTE jobs. Table omits combination of options and total deficit reduction which would require reductions of more than \$1 billion from any single option. Table calculated by extrapolating from the estimated impacts of reducing the deficit by \$100 million shown in Table III-7.

Table V-2 shows several measures of the scale of Alaska jobs and income against we can compare the scale of potential short-run economic impacts of reducing the deficit. We believe that the largest measures of income and employment (total personal income and total full-time and part-time employment) are most appropriate for thinking about the relative income and job impacts of reducing the deficit.

Table V-2
Selected Estimates of Alaska Income and Employment, 2014

Income (\$ millions)	Total personal income	39,793
	Total earnings by place of work	30,059
	Total wages and salaries	20,683
Employment (jobs)	Total full-time and part-time employment	465,130
	Total wage and salary jobs	367,291
	Total other jobs	97,839

Source: Bureau of Economic Analysis, SA30 Economic Profile (updated September 30, 2015), www.bea.gov.

In the tables on the following page, we compare estimated short-run income impacts of reducing the deficit with total personal income (Table V-3) and estimated short-run job impacts of reducing the deficit with total full-time and part-time employment (Table V-4). Note that using smaller measures of total incomes or jobs would result in proportionally larger percentage short-term economic impacts.

Depending on which short-run impact estimates we use (low or high scenarios) and which combination of fiscal options we assume, the short-run income impacts of reducing the deficit by \$3 billion could be between 5% and 10% of Alaska income (Table V-3). Depending on which short-run impact estimates we use (low or high scenarios) and which combination of fiscal options we assume, the short-run job impacts of reducing the deficit by \$3 billion could be between 3% and 6% of Alaska jobs (Tables V-4). The income and job impacts would be proportionally less for smaller total deficit reductions.

Clearly the potential economic impacts of fully reducing the deficit are large. Reducing the deficit will significantly impact Alaska's economy, regardless of how we do it. But some combinations of options for closing the deficit would have smaller short-run impacts than others, particularly those which include saving less (adding less of Permanent Fund earnings to the principal as inflation proofing or to the earnings reserve).

Table V-3

Estimated Income Impacts of Reducing the Deficit by Selected Total Amounts Using Different Potential Combinations of Fiscal Options, Expressed as a Share of Estimated Total Alaska Personal Income in 2014 (\$39.8 billion)

		Two options						Three options				Four options
Combinations of fiscal options	Spending cut: broad-based	50%	50%		50%			33%	33%	33%		25%
	Income tax: progressive	50%		50%			50%	33%		33%	33%	25%
	Dividend cut		50%	50%		50%		33%	33%		33%	25%
	Saving less				50%	50%	50%		33%	33%	33%	25%
\$100 million	Income: Low scenario	0.3%	0.3%	0.3%	0.1%	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%
	Income: High scenario	0.3%	0.3%	0.4%	0.1%	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%	0.3%
\$500 million	Income: Low scenario	1.4%	1.5%	1.6%	0.6%	0.8%	0.8%	1.5%	1.0%	0.9%	1.1%	1.1%
	Income: High scenario	1.6%	1.7%	1.8%	0.7%	0.9%	0.9%	1.7%	1.1%	1.1%	1.2%	1.3%
\$1.0 billion	Income: Low scenario	2.8%	2.9%	3.2%	1.2%	1.7%	1.6%	3.0%	1.9%	1.9%	2.2%	2.2%
	Income: High scenario	3.2%	3.3%	3.6%	1.4%	1.9%	1.7%	3.4%	2.2%	2.1%	2.4%	2.5%
\$1.5 billion	Income: Low scenario	4.2%	4.4%	4.8%	1.9%	2.5%	2.3%	4.5%	2.9%	2.8%	3.2%	3.4%
	Income: High scenario	4.8%	5.0%	5.4%	2.2%	2.8%	2.6%	5.1%	3.3%	3.2%	3.6%	3.8%
\$2.0 billion	Income: Low scenario	5.6%	5.8%	6.5%	2.5%	3.4%	3.1%	6.0%	3.9%	3.7%	4.3%	4.5%
	Income: High scenario	6.4%	6.6%	7.2%	2.9%	3.7%	3.5%	6.7%	4.4%	4.2%	4.8%	5.1%
\$2.5 billion	Income: Low scenario							7.4%	4.9%	4.6%	5.4%	5.6%
	Income: High scenario							8.4%	5.5%	5.3%	6.0%	6.3%
\$3.0 billion	Income: Low scenario							8.9%	5.8%	5.6%	6.5%	6.7%
	Income: High scenario							10.1%	6.6%	6.4%	7.2%	7.6%

Note: Table omits combination of options and total deficit reduction which would require reductions of more than \$1 billion from any single option.

Table V-5

Estimated Job Impacts of Reducing the Deficit by Selected Total Amounts Using Different Combinations of Fiscal Options, Expressed as a Share of Estimated Total Alaska Full-Time and Part-Time Employment in 2014 (465,000 jobs)

		Two options						Three options				Four options
Combinations of fiscal options	Spending cut: broad-based	50%	50%		50%			33%	33%	33%		25%
	Income tax: progressive	50%		50%			50%	33%	0%	33%	33%	25%
	Dividend cut		50%	50%		50%		33%	33%		33%	25%
	Saving less				50%	50%	50%		33%	33%	33%	25%
\$100 million	Jobs: Low scenario	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
	Jobs: High scenario	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%	0.2%
\$500 million	Jobs: Low scenario	0.8%	0.9%	0.6%	0.5%	0.3%	0.3%	0.8%	0.6%	0.5%	0.4%	0.6%
	Jobs: High scenario	1.1%	1.2%	0.9%	0.7%	0.5%	0.4%	1.1%	0.8%	0.7%	0.6%	0.8%
\$1.0 billion	Jobs: Low scenario	1.6%	1.7%	1.2%	1.1%	0.7%	0.6%	1.5%	1.2%	1.1%	0.8%	1.2%
	Jobs: High scenario	2.2%	2.3%	1.8%	1.4%	1.0%	0.8%	2.1%	1.5%	1.5%	1.2%	1.6%
\$1.5 billion	Jobs: Low scenario	2.5%	2.6%	1.9%	1.6%	1.0%	0.9%	2.3%	1.7%	1.6%	1.2%	1.7%
	Jobs: High scenario	3.3%	3.5%	2.7%	2.0%	1.4%	1.3%	3.2%	2.3%	2.2%	1.8%	2.4%
\$2.0 billion	Jobs: Low scenario	3.3%	3.5%	2.5%	2.1%	1.3%	1.2%	3.1%	2.3%	2.2%	1.7%	2.3%
	Jobs: High scenario	4.4%	4.6%	3.6%	2.7%	1.9%	1.7%	4.2%	3.1%	2.9%	2.4%	3.2%
\$2.5 billion	Jobs: Low scenario							3.9%	2.9%	2.7%	2.1%	2.9%
	Jobs: High scenario							5.3%	3.9%	3.7%	3.0%	3.9%
\$3.0 billion	Jobs: Low scenario							4.6%	3.5%	3.3%	2.5%	3.5%
	Jobs: High scenario							6.3%	4.6%	4.4%	3.6%	4.7%

Note: Table omits combination of options and total deficit reduction which would require reductions of more than \$1 billion from any single option.

How Fast Should We Reduce the Deficit?

Our primary focus in this study was on the *relative* economic impacts of different fiscal options, rather than their total impact on the economy or how fast we should reduce the deficit. However, we can offer a few observations on this question.

Fully closing the deficit in one year would have a large impact on an economy already weakened by oil industry job cuts and large cuts to state capital spending over the past few years for which we have not yet felt the full impacts. This would be an argument for not attempting to fully close the deficit this year.

But there are also strong arguments for making significant progress towards closing the deficit this year. First, within a few years we will *have to* substantially reduce the deficit, because we do not have sufficient reserves to continue very large deficits. The sooner we begin to substantially reduce the deficit, the longer the reserves will last.

Second, delay in making significant progress towards closing the deficit this year—and planning for how we will close the rest of it—would also have significant negative economic consequences. These include:

- Falling confidence in whether Alaska *can* make the tough choices we face in achieving sustainable and predictable spending, services and revenues.
- Increasing business and household uncertainty about future state spending, state services and taxes—and whether Alaska will remain a good place for businesses to invest and for people to work, live and call home.
- Reduced business and household investment
- Negative effects on public and private employee morale, turnover and recruitment
- Certain further downgrading of Alaska's credit rating.

Our economic adjustment to lower oil revenues will be smoother if we substantially reduce the deficit this year and also clearly demonstrate to Alaskans, businesses, and investors that we will make the necessary further changes to spending, revenues and uses of Permanent Fund earnings to achieve sustainable state finances, reduce uncertainty about future state spending and how we will pay for it, and build confidence in Alaska's fiscal future.

Our fundamental problem is that we have lost billions of dollars of oil revenue which formerly supported most of state general fund spending, and which we are unlikely to regain. We will have to adjust to this new reality. We can't avoid significant economic impacts from this adjustment. We can only delay them by drawing down our savings, but we don't have enough savings to delay them very long—and delay also has significant negative economic consequences. We can't permanently support our economy by running deficits.

VI. OTHER ECONOMIC IMPACTS OF ALASKA FISCAL OPTIONS

This report has focused on revenue impacts and short-run economic impacts of selected Alaska fiscal options. All of the fiscal options which we studied would have longer-term and indirect impacts which we didn't study. And there are important fiscal options currently under discussion (such as changes to oil taxes and credits) that we didn't study at all.

What we could study was limited by the available funding and by the time of ISER researchers. We focused on revenue impacts and short-run economic impacts because they are important to the ongoing discussion of Alaska fiscal options, and because they are relatively straightforward to analyze.

We didn't study potential longer-term and indirect impacts of fiscal options because they are more varied, more complex and harder to estimate—because of the many complex feedback loops between state spending and revenues and Alaska's economy and population over time. Similarly, we didn't study potential impacts of changes to oil taxes and credits because these impacts would be complex and difficult to predict and would require a major separate study.

In this chapter we briefly list some of the potential longer-term and indirect economic impacts of selected fiscal options. This list might be considered a start towards a list of other economic impacts which matter and which we should think about as we discuss Alaska fiscal options—and which deserve further research. It would have been far beyond the scope of this study to estimate these other economic impacts.

In briefly listing some of these other potential impacts of fiscal options, our purpose is not to offer any conclusions about how much weight they should or shouldn't carry as arguments for or against any fiscal option. Our purpose is simply to emphasize that while this study has addressed *some* of the questions relevant to understanding the economic impacts of fiscal options, many other questions remain to be answered.

Other Potential Economic Impacts of Spending Cuts

Impacts of Reductions in State Services

The potential economic impacts of spending cuts go beyond potential job and income losses of state employees and the resulting multiplier impacts on other jobs and income. They also include the potential economic impacts of reductions in state services resulting from the spending cuts. These potential impacts range from direct, immediate and obvious economic impacts to indirect, longer-term and less obvious impacts. For example:

- Cuts to Marine Highway spending, by affecting ferry service routes and timing, could affect tourist travel to some communities and the tourism industry in those communities.
- Cuts to fisheries management spending could affect the ability of fisheries managers to monitor and research fisheries catches, salmon escapement, and fishery resource conditions. Given the constitutional requirement to manage fisheries sustainably, this

could lead to more conservative fisheries management, reducing commercial fishing catches and sport fishing opportunities, with impacts on commercial harvest values (and fish tax revenues) and on sport fishing guide incomes.

- Cuts to University of Alaska funding could affect the number and quality of University of Alaska program and course offerings, which could in turn affect the number of young Alaskans who choose to attend the University of Alaska. In the short-term, this could affect the extent to which the spending of these young Alaskans on tuition, housing, food, recreation (and everything else they spend money on) stays in Alaska—creating income and jobs—or leaves Alaska. Over the longer-term, it could affect how many young Alaskans stay in or leave Alaska permanently, and Alaska's future workforce.

These are only a few examples of potential economic impacts of reductions in state services , but the list could be as long as the full range of state services. Note that our point is not to argue that any of these spending cuts should not be made. It is simply that the economic impacts may exceed the short-term job and income impacts which we analyzed for this study. Put differently, if we care about the economy, then we shouldn't make decisions about what and how much to cut just based on how many jobs or how much income the spending creates, or how many jobs or how much income would be lost if the spending is cut. We should also think about what we get from the spending, and how what we get affects the economy.

Impacts on Alaska Economic Development and Future Revenues

Some kinds of state spending may be thought of as investments in economic development which may in the future generate not only economic benefits but also state revenues. For example:

- Transportation infrastructure projects may lower costs of and stimulate new resource development, increasing potential future state revenues.
- Marketing for tourism or seafood may increase tourism or seafood sales or prices, benefiting these industries and also increasing the tax revenues which they pay.
- Workforce training may lower the costs of labor for new economic development and increase the share of jobs that can be filled by Alaskans.

Cutting spending for these kinds of "investments" could arguably have potential adverse economic impacts on Alaska's future economic development and revenues. There are numerous other potential examples.

In the extreme, the argument could be made that almost any kind of state spending is an "investment in economic development." Anything that the state does to improve the quality of life for Alaskans, or reduces the cost of living or doing business in Alaska, can arguably stimulate economic development by making Alaska a more attractive place for businesses to invest and for people to work and live. So in the extreme, any cuts to any kind of state spending could be argued to have potential adverse economic impacts on Alaska's future economic development.

In evaluating arguments that some kinds of state spending are should not be cut because they are investments in economic development, it is important to consider the relative rates of return on these "investments." How much economic benefit is any given "investment" actually likely to create, and when will we get these benefits? How much additional state revenue is the "investment" likely to generate, and when will we receive these revenues? How do the economic benefits and financial rates of return compare with other potential state investments?

Just because an investment will have positive economic benefits or will generate economic revenues does not necessarily mean that the benefits outweigh the costs, or that the investment is the best use of available funds.

Impacts on Future State Costs and Spending

Some kinds of spending cuts may be "penny-wise but pound foolish." They may save money now, but may lead to higher costs in the future.

Some kinds of costs can be temporarily but not permanently deferred. These include but are not limited to maintenance of state roads, buildings and equipment. Spending can be cut by deferring maintenance for a period of time. But as maintenance is deferred, over term the quality and reliability of roads, buildings and equipment deteriorates, and lack of maintenance can eventually lead to the necessity of costly repairs or full losses of assets. Deferring costs can be a useful strategy for addressing temporary short-falls in state funding. But it is less likely to be a useful strategy for dealing with a long-term decline in state oil revenues.

Cuts to some kinds of state spending now may lead to higher needs for and costs of other kinds of state spending in the future. For example:

- Spending for preventative medical services may reduce future costs of medical treatment.
- Spending for education, alcohol and drug treatment programs, and prisoner rehabilitation and education may all reduce crime rates and recidivism and future costs of crime and prisons.

Advocates for many kinds of programs that spending for their programs will more than pay off in reduced costs for other programs. It can be difficult to tell whether this is actually the case, given the number and complexity of factors that drive demand for different state services. In some cases, there may be well-documented research that shows that they are justified. In other cases, the evidence may be weak or non-existent.

We haven't studied what kinds of spending cuts might cost money rather than save money, by increasing needs for and costs of other kinds of spending. Clearly this should be an important question and consideration for some kinds of potential spending cuts.

Impacts of Cost Shifting

Some kinds of state spending cuts could result in cost shifting, or shifting the responsibility of paying for state services that are currently paid for by state general funds. Here are a few potential examples:

- Cuts to revenue sharing for local governments could lead to increases in local taxes to make up for local government revenue short-falls.
- Cuts to state funding for retirement obligations could increase the share of these obligations which would have to be paid by local governments and school systems, which could also lead to higher local taxes.
- Cuts to state agency budgets could lead to shifting of responsibilities for providing services to local government agencies, which would need to increase local taxes to pay for the increase in local government costs. For example, if the state plows fewer roads or reduces the number of state troopers, local governments may face higher costs for road plowing or police protection.
- Cuts to state agency budgets could also lead to increases in user fees to pay for services provided by these agencies. For example, cuts to the University of Alaska budget could lead to higher tuition fees; cuts to the Marine Highway budget could lead to higher Marine Highway fares; cuts to the state parks budget could lead to higher park user fees; and cuts to the Department of Fish and Game budget could lead to higher sport fishing license and commercial fishing permit fees.

Our point is not to argue against cost-shifting. It may be appropriate for local governments or service users to pay higher shares of costs which the state is currently paying. Rather, our point is that the economic impacts of cost shifting would be more like those of tax increases than of spending cuts. They may not necessarily result in less being spent on government services, but rather increases in what Alaskans have to pay for services, in the form of local taxes or user fees.

Impacts on Federal Matching Funding

Federal spending is a significant driver of Alaska's economy. Some kinds of federal spending, such as federal transportation projects, require that the state "match" a share of the federal funding. Cuts to state spending which serve as a "match" to bring in additional federal funding could have a significantly amplified economic effect. The greater the ratio of federal spending to the required state match, the greater the potential economic impact of cutting funds which match federal funds.

We have not done (or seen) any analysis of how much of total state spending serves as a match for federal funds, or the extent to which cuts to state spending have occurred or been proposed which have or would cost the state federal matching funds. It would be useful, in advancing understanding the potential implications of spending cuts, to review how much of the budgets of

different state agencies serves to match federal funds, and how much and what kinds of federal funding they bring in. Our point is not to argue that the state should necessarily pay for anything that brings in federal matching funding. It is simply that when spending does bring in federal funding, the economic impacts of state spending cuts are magnified.

Impacts on Public Employees

The quality of the services which state government, the University of Alaska, K-12 schools and other state-funded organizations provide to Alaska depends critically on the quality, experience and morale of the people who provide these services. It matters a lot what kinds of people we have as state troopers, fishery managers, school teachers, and oil tax accountants--and in fact in every kind of state government position.

How state spending is cut, and how spending cut decisions are made, significantly affect working conditions for public employees and how they feel about their future career prospects, which in turn can significantly affect public employee morale, turnover, and recruitment. Over time, these factors may significantly affect the quality of Alaska's public workforce and the public services they provide.

We are not arguing that state spending should not be cut, or that public employees staffing levels, pay and benefits should not be scrutinized. Clearly, given the seriousness of the financial challenge faced by the state, every kind of state spending should be scrutinized. But it is important to recognize that over time spending cuts, and how we make them, may affect not only the number of public employees but also what kinds of public employees we have.

Other Potential Economic Impacts of Taxes

Our analysis for this study focused on potential revenue impacts and short-run economic impacts of selected tax options: how much money would they collect from whom, and how would the loss of disposable income affect spending and the economy.

In addition to these revenue impacts and short-run economic impacts, taxes may have a wide variety of indirect and longer-term economic impacts, which are the subject of very broad and long-running economic and political debates. In general, and in most states, taxes are a “necessary evil”—countries and states impose taxes not because they are good for the economy or because anyone likes paying taxes, but rather because there needs to be some level of government and there needs to be some way of paying for it. Thus the major economic and political debates are over:

- What is the appropriate balance between the positive impacts of government and the negative impacts of taxes?
- What kinds of kinds of taxes minimize the negative impacts of taxes?
- What kinds of taxes are most fair?

These same broad economic and political questions matter for Alaska in thinking about potential tax options for reducing the deficit. In addition, there are many specific questions related to potential negative impacts as well as potential positive impacts of tax options. Examples of potential negative impacts include (to name just a few):

- Sales taxes might affect the extent to which Alaskans buy from local retailers as opposed to out-of-state or online retailers.
- In areas where prices are high, people would pay relatively higher sales taxes for any given item than people would pay in areas where prices are lower.
- Taxes on resource industries might reduce the rate of return on investments and make Alaska less competitive (relative to other resource producing states or regions), reducing resource industry investment and jobs.
- Taxing fish processing workers might increase the wage rates fish processors might need to pay to attract workers, adding to their costs and reducing fish prices to fishermen.
- Taxes have both administrative and enforcement costs. Some kinds of taxes have significantly higher administrative costs than others. For example, sales taxes would likely have significantly higher administrative costs than income taxes (particularly income taxes tied directly to federal tax obligations).

Not all potential economic impacts of taxes for Alaska would necessarily be negative. Examples of potential positive impacts include:

- When people pay taxes, they have “skin in the game” in political decisions about spending. If they don’t pay taxes, they may care less about and pay less attention to how much government spends and what the spending goes to. The more they pay in taxes, the more careful attention they may pay to spending (and the less they may demand in spending).
- When people and industries pay taxes, economic growth and population growth pays for itself. Currently, because most Alaskans and most Alaska businesses pay relatively low taxes to state government, when the economy grows and population grows, it’s good for business but it’s not good for state finances, because the demands for and costs of state government services such as schools and roads increase but the revenues don’t increase enough to pay for the higher costs. This problem has been called the “Alaska disconnect.” If Alaska residents and businesses paid higher taxes, it would help to reduce the Alaska disconnect.

Our point is not to argue for or against any of these potential negative or positive impacts of taxes. Rather, our point is that these potential longer-term and indirect impacts of taxes matter—and deserve further discussion and research as we consider Alaska’s fiscal options.

Other Potential Economic Impacts of Dividend Cuts

Alaskans have widely differing perspectives on the Permanent Fund dividend program. Some emphasize what they perceive to be positive impacts of the dividend program (and corresponding potential negative effects of dividend cuts). Others emphasize what they perceive to be negative impacts of the dividend program (and corresponding potential positive effects of dividend cuts).

To some extent, these differences in perspectives reflect fundamental philosophical differences about “whose money it is” and what Permanent Fund dividends are. Some Alaskans argue that dividends are the peoples’ share of Alaska’s resource wealth and that the money is their money rather than money which the government gives them. Other Alaskans argue that the dividends are government spending like any other kinds of spending, and should be subject to the same kind of scrutiny and prioritization as other kinds of spending.

Beyond these philosophical issues, there are important questions about a wide range of potential indirect and long-term impacts of dividend cuts and/or other changes to the dividend program. Some examples include:

- How would dividend cuts affect the ability of lower-income Alaskans to afford to live in Alaska, particularly in high-cost rural areas?
- How would dividend cuts affect the ability of Alaskans to accumulate wealth for “big-ticket” costs and investments such as college educations and home down-payments?
- How would dividend cuts affect Alaska wage rates? Would lower dividends mean that employers would have to pay workers more because people would need to earn more in order to live in Alaska?
- How would dividend cuts affect how many and what kinds of people move to Alaska or leave Alaska? Do dividends “attract” poor people or large families to Alaska?
- How would dividend cuts affect the extent to which Alaskans feel they have a stake in the Permanent Fund and their commitment to growing and protecting it over time?

Our point is not to argue for or against either of the philosophical perspectives of whose money the dividends are or what the longer-term and indirect impacts of the dividend might be. Our point is rather that what matters, in thinking about the option of cutting dividends, clearly goes beyond the short-term revenue and economic impacts to longer-term and more complex potential impacts.

Conclusions

Alaska’s fiscal options would impact Alaska’s economy and society in many important ways beyond the short-term economic impacts which we estimated for this study. We should base our fiscal choices not only on their short-term economic impacts but also on their longer-term impacts on Alaska’s economy and society over time.

APPENDIX A

ESTIMATION OF REVENUE IMPACTS OF FISCAL OPTIONS

This appendix provides technical documentation and detailed results for our analyses of fiscal options involving new revenues or dividend cuts, including the total and relative shares of revenues that would be collected from different income groups, and impacts on expenditures by different income groups.

Data and Methods

The analysis relied on three primary data sets. Data from Alaska respondents to the national Consumer Expenditure Survey (CES) provided information on household expenditures and potential sales tax revenues and effects. Internal Revenue Service (IRS) tabulations of federal income returns of Alaska residents provided information on potential income tax revenues. The American Community Survey Public Use Microdata Sample (ACS PUMS) provided demographic information and income of Alaska residents to scale up effects per person and per household to the state as a whole. Estimating total revenues and the distribution of effects across households required linking these three different data sets, each of which uses a different unit of analysis.

Consumer Expenditure Survey (CES)

The CES is an annual survey conducted in all 50 states by the U.S. Bureau of Labor Statistics (<http://www.bls.gov/cex/home.htm>). The survey unit is a "consumer unit" (CU), which is basically a family. Residents of group quarters such as student housing, remote industrial work sites, and jails, are not included in the survey. The CES consists of two parts: an interview survey that asks about expenditures over the previous three months, and a separate weekly diary survey for items such as food and household supplies that are typically purchased frequently in small quantities. The most recent year of data available for research -- the Public Use Microdata (PUMD) -- represents expenditures in 2014. The Alaska sample size is quite limited. We combined the 2013 and 2014 CES PUMD samples, which provided 678 quarterly observations on 279 CUs (families).

To analyze expenditure patterns, we added all the observations on expenditures during the previous three months on each type of product for each CU. We multiplied the sum of expenditures by four divided by the number of quarters observed to obtain an estimate of annual expenditures for each CU. We then combined the detailed annual expenditure categories into six large categories: food at home, goods, services, shelter, health care, and education (primarily tuition). The goods category included food away from home, alcoholic beverages, tobacco products, household furnishings, apparel, vehicle purchases (new and used), gasoline and motor oil, reading materials, other household expenditures, and miscellaneous goods. The services category included telecommunications services, insurance (home, vehicle, life, etc.), domestic services, child care, home and vehicle maintenance and repair, vehicle rental, public transportation, entertainment, and personal care services. The shelter category included rent, other lodging, and household utilities excluding telecommunications. Expenditures on loan payment interest and principal were not included in the analysis.

It is important to understand the limitations of the Alaska CES sample. The number of households sampled each year is relatively small. It is not clear what the geographic coverage is, so it is not possible to determine if the sample is geographically representative. Despite these limitations, the CES remains a valuable tool for understanding consumer expenditure patterns and potential sales tax revenues, as it is the only source of expenditures that is available for analysis at the household level.

CES data can be summarized by per-capita household income and many other household characteristics. However, the small sample size and unknown geographic coverage makes these breakdowns unreliable. We instead estimated equations to predict how much a family would spend on the various categories of goods and services as a function of per-capita income and the number of people in the CU (household size). We estimated both linear and loglinear relationships. The equations were estimated as censored regressions to address the fact that expenditures could not be negative. The loglinear specifications generally provided a better fit to the data, except in the case of education expenditures, for which the linear censored regression provided a more realistic prediction, probably due to the fact that relatively few households had education expenditures.

We used the equations estimated from the CES to estimate the tax base for sales taxes as well as the effect of various revenue measures on expenditures and the economy, as described below. Appendix B, Tables B-1 through B-8 display the complete statistical results of the equations used to project expenditures in the six categories.

IRS Statistics of Income (SOI) data

The Internal Revenue Service publishes data summarizing federal individual income tax returns at various geographic scales through its Statistics of Income (SOI) program. We estimated the relationship between total income and taxable income, as well as average and marginal effective tax rates for tax returns at different income levels, from published tables at the state level (<https://www.irs.gov/uac/SOI-Tax-Stats-Historic-Table-2>). The estimated relationships between total income, taxable income, and income tax payments were then used to estimate both the amount and distribution of hypothetical state income taxes and the effect of state taxes and changes in Permanent Fund Dividend payments on Alaska taxpayers' federal income tax liabilities.

The IRS groups tax returns by income per return. The unit is therefore the tax return rather than the household or family. The main important difference between tax returns and households is that married taxpayers filing separately generate two returns. We therefore adjusted the distribution of income per return to account for returns with a married-filing-separately status.

The IRS SOI has a number of limitations in addition to the problem of joint tax returns. Not all taxpayers file returns. In particular, low income households are much less likely to file tax returns. Neither the number of exemptions nor number of dependents plus one exactly captures household size, due not only to the issue of married taxpayers filing separately mentioned above but also because there are often multiple taxpayers living in the same household. For example,

employed adult children living with their parents will likely file their own returns, as will unmarried partners living together. The income reported to the IRS may differ from income reported on surveys such as the CES and ACS, especially for self-employed taxpayers.

Despite its limitations, the IRS SOI provide an essential data source that permits us to estimate how effective tax rates vary by income as well as total federal taxes paid: the best base for estimating how much money a state income tax might raise. We used data for the most recent year available: 2014 tax filings, representing income earned in 2013.

American Community Survey Public Use Microdata Sample (ACS PUMS)

Neither the CES nor IRS SOI data sets represent the entire population of Alaskans. To scale to the Alaska population and properly represent demographic patterns and the distribution of income, we rely on the ACS PUMS (<https://www.census.gov/programs-surveys/acs/technical-documentation/pums/documentation.html>).

The ACS is an annual survey of households and residents of group quarters conducted by the U.S. Census Bureau. It provides the official statistics on income, household composition, poverty rates, and many other social and economic characteristics of the population. Income in the ACS is self-reported, so it includes whatever the respondent says they earned. It should include PFD payments for everyone in the household that received a dividend. It will also include cash public assistance, but not food stamps or any other "in kind" assistance.

The PUMS is a five percent sample of survey returns stripped of information that could identify individual households. The main difference between the PUMS and the original surveys is that geographic information is limited to large regions of Alaska. We used PUMS data for 2014, the most recent year available. The individual and household income reported in the 2014 survey represents income earned in 2013. Note, as discussed below, that the PFD was \$900 in 2013, which is significantly less than it was in 2014 or 2015.

The ACS reports both total household income and income of individuals. We computed per-capita household income by dividing household income by the number of people in the household. Household income is not defined for group quarters residents, so we assumed that per-capita household income of group quarters residents was the same as individual income. To develop the distribution of income, we divided the all the households into ten groups, ranked by per-capita household income. For this step, group quarters residents were considered households with a household size of one. Each decile of the income distribution therefore represents ten percent of households plus group quarters residents, not ten percent of individuals. Since household size tends to be somewhat larger in households with lower per-capita household income relative to those with higher per-capita household income, the poorest deciles include somewhat more individuals than the richer households.

Table A-1 shows the number of people, average household income and per-capita income for the ten deciles of households. The data represent 2013 income in 2013 dollars. In addition to the 736 thousand Alaska residents the Census Bureau estimated for 2013, the Alaska Department of Labor reported 86 thousand non-residents were employed in Alaska and earned an average of

nearly \$28,000 per worker (<http://laborstats.alaska.gov/reshire/NONRES.pdf>). It should be noted that this figure understates the total number of non-resident workers, as it does not include federal government employees including active-duty military personnel, or self-employed individuals.

Table A-1. Alaska Population, Persons per Household, and Per-capita Income by Per-capita Household Income Percentile.

Income percentile, households	Population	Average persons per household	Per-capita income in 2013	Per-capita income with \$2,000 PFD ^a
Lowest 10 percent of households	87,006	2.94	\$ 3,594	\$ 4,694
10-20th percentile	89,660	3.03	10,465	11,565
20-30th percentile	76,040	2.62	15,613	16,713
30-40th percentile	84,404	2.84	20,412	21,512
40-50th percentile	85,077	2.93	25,935	27,035
50-60th percentile	78,178	2.66	32,818	33,918
60-70th percentile	67,327	2.27	40,265	41,365
70-80th percentile	63,722	2.18	51,154	52,254
80-90th percentile	57,284	1.95	65,707	66,807
Highest 10 percent of households	47,771	1.63	126,890	127,990
All residents	736,471	2.51	\$ 39,246	\$ 40,346
Non-resident workers	86,455		27,760	27,771

^a Assuming all income is the same as in 2013 except the Permanent Fund Dividend, and that one percent of dividends is paid to non-residents.

Source: American Community Survey 2014 Public Use Microdata Sample. Group quarters residents included as one-person households.

In 2013, the Alaska Permanent Fund Dividend (PFD) was \$900. Dividends have been larger in more recent years. For comparison, the last column of Table A-1 shows what per-capita income would be if all income except the PFD was the same as in 2013, but with a PFD of \$2,000. Data from federal income tax filings (<http://labor.alaska.gov/research/pop/migration/data/IRSMigrationState.xls>) and the ACS (<http://live.laborstats.alaska.gov/cen/acsdetails.cfm>) indicate that each year about five percent of residents moved to Alaska within the previous year. In the past few years, the population has been stable, indicating that about six percent moved out of state every year.

Although the PFD is available only to residents, some of those moving away would likely have received dividends. Leaving aside the issue of fraud, there are many reasons why some people might have filed legitimate PFD applications early in the year but unexpectedly moved before the PFD was paid out, such as dissolving relationships, military transfers, job loss, and family

medical issues. If we assume that one-sixth of those leaving each year received their PFD, then about one percent of the PFD would have been received by non-residents.

Estimating Revenues and Their Distribution

Using the CES, IRS, and ACS data to estimate potential state revenues generated by various fiscal options and the distribution across the population of the impact on disposable income involved a number of steps. First, we applied the relationships between total income per tax return, the number of dependents, taxable income, and average and marginal tax rates in the IRS SOI data to household income and household composition in the ACS PUMS households to estimate federal income taxes per ACS household. Persons in households reporting a marital status of separated were assumed to have a tax status of married filing separately. One person in households with children under 18 but no married adults was assumed to file as head of household, and any others with income above the IRS threshold were assumed to file as single taxpayers.

The initial attempt to impose the federal income tax structure on ACS households generated federal income taxes about 25 percent higher than actual tax payments reported in the IRS SOI data. There are a number of possible explanations for the discrepancy. Chief among them are the likelihood that income reported in the ACS exceeded income reported to the IRS, especially for self-employed individuals, and that more households generated multiple separate tax returns than we estimated. Consequently, we multiplied the computed federal income taxes by 0.8 to scale the total tax payments to the amount actually received by the IRS.

In the next step we applied the expenditure functions estimated from the CES consumer units to the per-capita income and household size of the ACS PUMS population. In addition to residents, non-resident workers and visitors contribute to retail sales in Alaska. Data on retail expenditures by non-residents is severely limited. Alaska alcoholic beverage tax receipts (<http://www.tax.alaska.gov/programs/programs/reports/index.aspx?60165>) show that alcohol sales in the three summer months are about 10 percent higher than in the September to May average. Sales tax receipts for Juneau and the Kenai Peninsula Borough show a 50 percent increase in the summer, but these boroughs are not representative of the state as a whole.

Given the uncertainties, we make rough estimates of non-resident expenditures on food at home and shelter are in proportion to non-resident wages as a share of total state wages. We estimate that 15 percent of commodities and 10 percent of services are purchased by non-residents. It should be noted that these are generous estimates of non-resident expenditures. The true figures are unlikely to be higher than these estimates and could be somewhat lower.

After including estimated purchases by non-residents, the total estimate expenditures still fall somewhat short of County Business Patterns (CBP) retail sales data for Alaska compiled by the U.S. Census Bureau (<http://www.census.gov/econ/cbp/>). CBP data indicate that 2013 total expenditures in Alaska in the six categories we modeled amounted to \$158 billion. We therefore adjusted estimated total expenditures to scale to the CBP total.

Table A-2 shows estimated per-capita expenditures for the six categories of expenditures analyzed in the same per-capita income deciles as in Table A-1. The bottom rows of the table show estimated total expenditures for residents and non-residents in the same categories. As mentioned before, the figures exclude mortgages payments (other than insurance) and other loan payments.

Table A-2. Estimated Annual Per-Capita Expenditures by Six Expenditure Categories

Income percentile, households	Food at home	Other commodities	Services	Shelter	Health care	Education
Lowest 10 percent of households	\$ 1,775	\$ 1,299	\$ 892	\$ 3,584	\$ 12	\$ -
10-20th percentile	2,087	2,718	1,866	3,520	85	-
20-30th percentile	2,332	3,677	2,533	4,022	179	-
30-40th percentile	2,389	4,520	3,108	3,745	320	16
40-50th percentile	2,472	5,449	3,744	3,648	534	420
50-60th percentile	2,652	6,564	4,520	3,983	842	194
60-70th percentile	2,883	7,729	5,342	4,603	1,217	-
70-80th percentile	3,048	9,361	6,476	4,784	1,992	-
80-90th percentile	3,295	11,454	7,944	5,289	3,255	196
Highest 10 percent of households	3,928	19,526	13,600	6,271	12,466	3,582
Average, all households	\$ 2,584	\$ 6,382	\$ 4,411	\$ 4,194	\$1,563	\$ 319
Total, residents (\$ millions)	\$ 1,903	\$ 4,700	\$ 3,249	\$ 3,088	\$1,151	\$ 235
Non-residents (\$ millions)	154	7050	325	250	93	19
Total expenditures (\$ millions)	\$ 2,057	\$ 5,405	\$ 3,574	\$ 3,338	\$1,244	\$ 254

Source: Estimated from Consumer Expenditure Survey, combined 2013 and 2014 Alaska sample households, and U.S. Census, County Business Patterns

Total Revenues Raised and Distribution Effects of Broad-Based Revenue Options

To analyze the effects of potential revenue options, we examined five specific potential broad-based fiscal measures that can be imposed at different rates to raise varying amounts of revenue. For the analysis, we examined hypothetical options of a similar scale: each measure was designed to raise \$350-\$400 million annually:

- Two percent flat rate income tax;
- Ten percent federal income tax surcharge;
- A \$600 reduction in the annual PFD;
- Four percent sales tax excluding food at home, health care, shelter, and education;
- Three percent sales tax including food at home and shelter, excluding education and health care.

In addition to these five measures, we also analyzed the effects of a potential state property tax. We assumed that property taxes levied by local governments would be credited from the state tax, analogous to the way that the state credits local governments in the existing state petroleum property tax. This makes it more difficult to scale than the other broad-based measures. Since the highest local property tax rate is currently 20 mils (2 percent), and the state already taxes petroleum property at that rate, we examined the potential effects of a 20 mil state property tax.

Total Revenue Raised

Table A-3 summarizes the total estimated revenues raised and the amounts from residents and non-residents for the five hypothetical options. As mentioned above, the PFD reduction assumes that one percent of dividends are paid to individuals who are no longer Alaska residents when the payments are received.

Table A-3. Estimated Resident, Non-resident, and Total Revenues Raised from Five Potential Revenue Measures

Revenue measure	Total revenue raised (\$ millions per year)		
	Alaska residents	Non-residents	Total, residents and non-residents
2 percent flat rate income tax	\$366	\$ 29	\$396
10 percent federal income tax surcharge	\$338	\$ 28	\$366
\$600 cut in PFD	\$380	\$ 4	\$384
4 percent sales tax excluding food at home, health care, shelter, and education	\$318	\$ 41	\$359
3 percent sales tax excluding education and health care	\$388	\$ 43	\$ 431

As shown in Table A-4, we estimated that a 20 mil tax on the full value of real and personal property, excluding oil and gas property already subject to state property taxation, would yield \$1.7 billion per year. To estimate the state property tax base, we started with the full and true value of real and personal property as determined by the Alaska state assessor's office, which was \$83 billion in 2015 (<https://www.commerce.alaska.gov/web/Portals/4/pub/OSA/2015-Full.pdf>).

Areas of Alaska outside the boundaries of established boroughs or cities not levying property taxes are not included in the state assessor's report. To estimate the statewide total property value, we multiplied the state assessor's figure for real property by the ratio of the state total value of housing to the value of housing in the organized boroughs of Alaska, as reported in the

American Community Survey (ACS). The state assessor's figure for real property includes commercial and industrial real estate (except oil and gas property) as well as housing; we assumed that the ratio of commercial real estate to residential housing was the same in the unorganized areas as in the boroughs. We estimated the value of rental housing by multiplying the reported monthly rent by 120. We estimated the state total personal property by multiplying the state assessor's estimate of personal property in the established boroughs by the ratio of state total number of motor vehicles to the number of vehicles in the established boroughs, as reported in the ACS. Taxable personal property includes mobile homes, airplanes, and boats as well as vehicles, so our assumption was that the ratio of all personal property to motor vehicles was the same in the boroughs as outside the boroughs.

Table A-4. Estimated Tax Base and Revenues Raised from a 20mil State Property Tax with Local Exemption, Excluding State-Assessed Oil and Gas Property

	Real property	Personal property	Total
	(Million dollars)		
Boroughs ^a	\$ 71,084	\$ 9,561	\$ 80,645
Cities in unorganized borough ^a	\$ 2,076	\$ 411	\$ 2,487
Total municipalities with property taxes ^a	\$ 73,160	\$ 9,971	\$ 83,131
Estimated unorganized borough property tax base ^b	\$ 5,740	\$ 560	\$ 6,300
Potential additional tax base ^c	\$ 3,663	\$ 150	\$ 3,813
Potential state total property tax base	\$ 76,824	\$ 10,121	\$ 86,945
tax rate (mils)	20.0		
Annual tax revenues			\$ 1,739
2015 local property tax revenues ^a			\$ 924
Potential annual new state revenues			\$ 815

^a Source: Full and true value as determined by the state assessor, *Alaska Taxable, 2015*.

^b Estimated from American Community Survey, ratio of Census Areas in the Unorganized Borough to Borough Totals, 2010 - 2014 average.

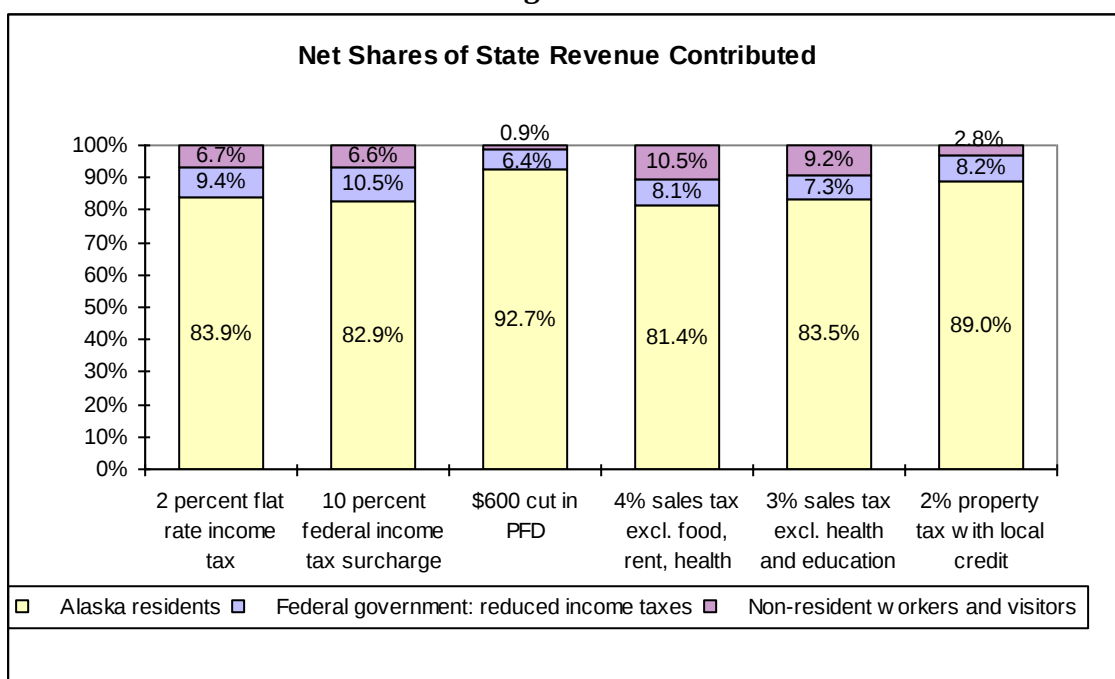
^c Total unorganized borough less cities in unorganized borough levying property taxes.

As shown in Table A-4, the scaled-up estimate of statewide property value was \$87 billion, \$3.8 billion more than the value currently subject to property taxation at the local level. Applying a 20 mil levy yields annual tax revenues of \$1.7 billion. After subtracting the \$924 million collected by local governments in 2015, one obtains \$815 million in potential new state revenues from the property tax.

Figure A-1 compares the percentages of revenues received by the state under the various fiscal options paid by residents, non-residents and the federal government. The federal government “pays” for a portion of the revenues because federal income taxes will be reduced when PFD

payments fall for most taxpayers. Alaska taxpayers itemizing deductions can deduct property taxes and either state income or sales taxes from federal taxable income. Information on non-resident property ownership is not systematically available, making estimates of the share of property tax revenues contributed by non-residents highly uncertain. To the extent that businesses pass the property tax on to their customers, non-residents purchasing goods and services from Alaska businesses would also be contributing a portion of the taxes along with residents. The estimated percentage of property taxes paid by businesses (other than housing rental businesses) times the non-resident share of total expenditures amounts to 2.8 percent of property taxes. This percentage, shown in Figure A-1, should be considered a low estimate, since it does not include property taxes paid by non-resident owners of vacant land and residential property.

Figure A-1



The two state income tax options differ only in the tax rate structure. The first tax option assumed a flat two percent rate on taxable income, while the tax rate for the second option was structured to be ten percent of the federal tax rate for that level of taxable income. State income or sales taxes are potentially deductible from federal taxable income. We assumed, however, that the state tax law would require that deductions for Alaska taxes would have to be added back in to the state definition of taxable income. Both income taxes assumed, therefore that the tax base for the state tax was equal to federal taxable income before state tax deductions. We did, however, consider the potential for Alaska taxpayers to deduct the Alaska tax from their taxable income for federal tax purposes. We estimated the federal tax savings as the Alaska tax times the marginal tax rate times the percentage of taxpayers at each income level itemizing deductions, according to the IRS SOI data.

Distribution of the Revenue Burden Among Alaska Households

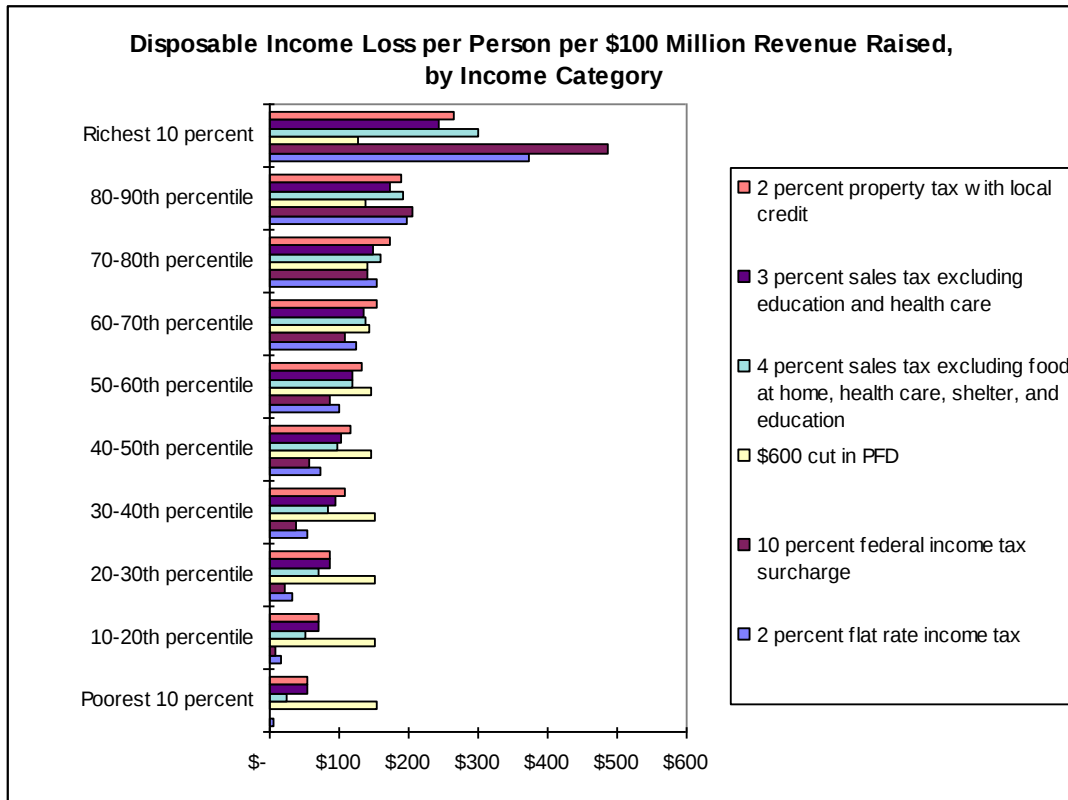
Figure A-2 compares how each of the broad-based revenue measures discussed above affects per-capita disposable income—income net of taxes—for households with different levels of per-capita income. Because each revenue option raises a different amount of revenue, the numbers in Figure A-2 are normalized to show the disposable income loss per \$100 million raised. We assumed that the entire amount of property taxes assessed on rental property would be passed on to renters. Although renters might not feel the full impact of the tax immediately, the higher costs to landlords would likely get built into new rental contracts as old contracts expire.

Property taxes paid by businesses would also almost certainly be passed on to customers. The only exception would likely be natural resource exports such as fish and minerals, where prices are set by world markets, not Alaska supply and demand. To assess the distribution of these business property taxes among Alaska households, we assumed that the property tax would add to the cost of living in proportion to non-shelter expenditures.

Reducing the PFD by \$156 per person and diverting the revenue to state government would raise \$100 million. However, only the poorest households would actually lose the full amount. Most households get a portion of the loss of income back in reduced federal income taxes. The higher the household's per-capita income, the more the taxes are reduced; disposable income of the richest ten percent of households would only fall on average by \$127. For all the other measures, the amount paid would rise as per-capita income rises, although in varying degrees.

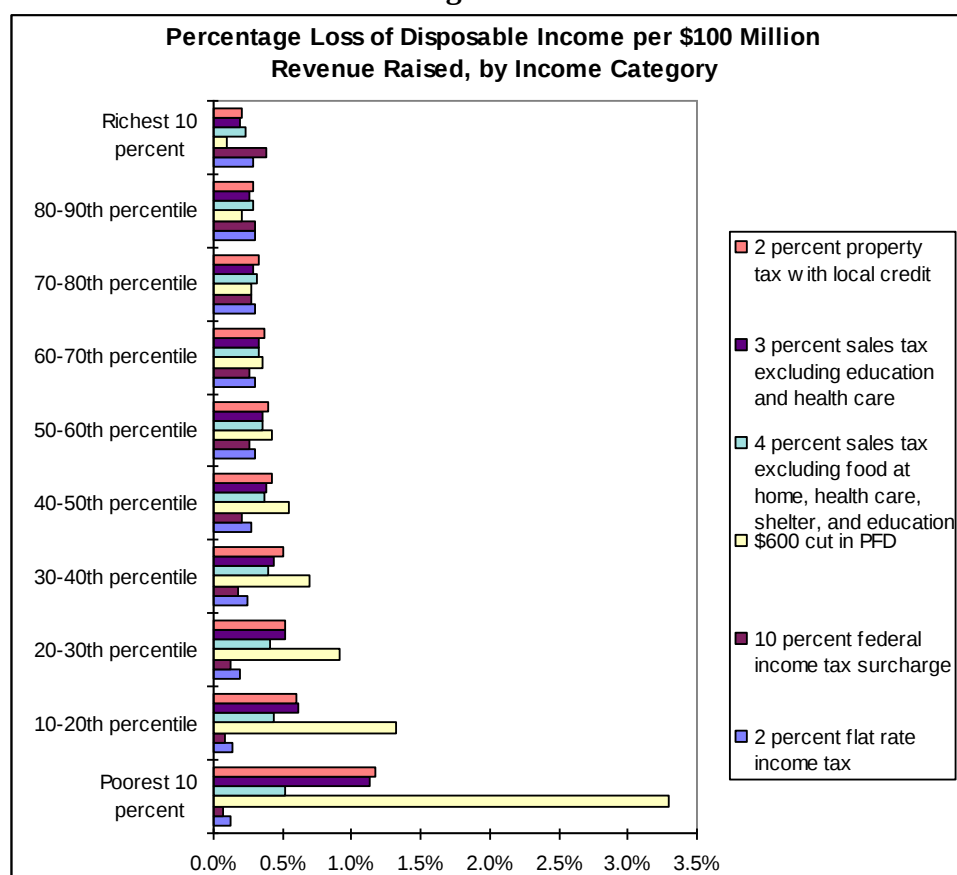
The ten percent of households with the highest per-capita income would pay about five times as much as the poorest ten percent for the sales tax including food at home and shelter. They would pay about 12 times as much if the sales tax excludes food and shelter, about the same multiple as the state property tax. In contrast, the ten percent of households with the highest per-capita income would pay about 70 times as much flat rate income tax as the poorest 10 percent, and about 160 times as much with the income tax surcharge.

Figure A-2



A fiscal measure is considered *progressive* if the percentage collected rises as income rises, and *regressive* if the percentage collected falls as income rises. Figure A-3 shows how the various fiscal measures would reduce disposable income for households for different per-capita income percentiles. The figure shows that the 2 percent flat rate income tax is progressive at lower income scales, due to the fixed exemptions and deductions for the tax base: federal taxable income. The 10 percent income tax surcharge is more progressive, following the progressive structure of the federal income tax. Even with the progressive rates, the income tax surcharge would reduce disposable income of the richest ten percent of households by less than 0.4 percent per \$100 million raised.

Figure A-3



In contrast to the income tax measures, the other fiscal options are quite regressive. The three percent sales tax option has lower rate but a broader base than the four percent option. The two types of expenditures excluded in the four percent tax -- food at home and shelter -- vary much less with income than do expenditures for other goods and services. In fact, because the shelter category includes rent but excludes payments for owner-occupied housing, and higher income households are much more likely to own their homes, there is very little variation in shelter expenditures across the different income percentiles. This makes sales taxes more regressive if they include food and shelter in the tax base. Non-residents also purchase less food at home and shelter relative to residents than they purchase other potentially taxable goods and services.

The poorest ten percent would lose 1.2 percent of income with the sales tax that includes food at home and shelter, while the richest 10 percent would lose only 0.2 percent of income. Even if food at home and shelter were excluded, the sales tax would still reduce disposable income of the poorest ten percent of households by twice as much as it reduced disposable income of the richest ten percent. The distribution of property taxes, as mentioned above, is very similar to the distribution of the sales tax that includes food and home and shelter. The reduction in the PFD is the most regressive of all. For every \$100 million raised with PFD cuts, the ten percent of households with the lowest income lose 3.3 percent of disposable income, while disposable income of the ten percent with the highest income falls by only 0.1 percent.

Effects of Revenue Measures on Expenditures

All the fiscal options will have some adverse effect on the economy, because they reduce disposable income. As disposable income falls, households spend less on goods and services. However, the amount that a tax increase or spending cut changes spending depends on how households react to the change in their economic circumstances, and how markets respond to the changes in household behavior. How households and markets will react is not known, causing substantial uncertainty in estimates of economic impacts of different measures. Without solid information, one is forced to make assumptions, which generally fall into two categories. First, one must make assumptions about how best to calculate the change in disposable income that drives changes in spending patterns. Second, one must make assumptions about how changes in disposable income affect spending.

The IMPLAN input-output model used to estimate the indirect (multiplier) effects of changes in spending has a set of embedded assumptions about income and spending. Because IMPLAN is based on regional output rather than regional income, it uses a place-of-work accounting framework that does not fully represent the distribution of effects for Alaska residents. That is why we use the Census/ACS income data to represent the distribution of the effects of revenue measures. IMPLAN has more complete information on spending than is available from the Alaska data in the Consumer Expenditure Survey, but its reliance on national expenditure data to estimate spending patterns may less accurately reflect how Alaska households would respond to loss of disposable income. In this section we discuss derivation of estimates of effects of revenue measures on expenditures using the Census/ACS and Alaska CES data. Methods for deriving estimates of effects of revenue measures on expenditures using IMPLAN are discussed in Appendix D.

Table A-5 shows how the main assumptions about income and spending compare for the IMPLAN vs. Census methods. In general, the IMPLAN assumptions imply both a higher sensitivity of disposable income to changes in taxes and income and a bigger impact on spending per dollar change in disposable income. Both methods include wages of non-resident workers. Neither probably captures accurately the income of self-employed non-residents such as commercial fishermen, however.

Table A-5. Assumptions About Income and Spending for Two Methods of Estimating Economic Impacts of Spending Cuts and Revenue Measures

Assumption	IMPLAN	Census
<i>Household income driving spending patterns includes</i>		
Wages of residents and non-residents working in Alaska	x	x
Income Alaskans earn from working outside the state		x
Alaska Permanent Fund Dividend payments	x	x
Income of self-employed Alaska residents from work in Alaska	x	x
Income of self-employed Alaskans from work outside Alaska		x
Income of self-employed non-residents from work in Alaska		
Income Alaska residents receive from Alaska investments	x	x
Income non-residents receive from Alaska investments	x	
Income Alaska residents receive from non-Alaska investments		x
Employer-paid job benefits	x	
In-kind assistance such as food stamps	x	
Rent homeowners avoid by owning their dwellings	x	
<i>Spending patterns driving economic impacts</i>		
Spending patterns based on national expenditure data	x	
Spending patterns based on Alaska-specific data		x
Spending changes in proportion to income	x	
Spending patterns differ between residents and non-residents		x
Resident households adjust spending patterns with income		x
Loan payments change in proportion to income	x	
Loan payments assumed fixed in short term		x
Change in housing prices considered part of spending change	x	
Change in housing prices ignored (benefits cancel out costs)		x

Using the expenditure functions estimated for the Alaska households in the CES, we derived estimates of the effect on disposable income changes on retail purchases resulting from the fiscal options. Figure A-5 summarizes the estimated effects of the six fiscal options on total expenditures, measured as expenditure loss per thousand dollars of revenue raised. Income taxes have the least effect on expenditures. The two different income tax options and the sales tax that excludes food at home and shelter have nearly identical effects on the economy: a reduction of \$507-512 per \$1,000 of revenues. The sales tax measure that includes food at home has a somewhat larger adverse effect on expenditures. The PFD cut has the largest effect – a reduction of \$646 per thousand dollars of revenue raised -- with the property tax having an intermediate effect between that of sales taxes and income taxes and that of the PFD cut.

Three factors explain the differences in expenditure effects among the various measures: the share of revenues contributed by non-residents, the share paid by the federal government, and how progressive or regressive the measure is. Lower-income Alaskans typically spend a higher

share of their income than higher-income Alaskans, so more regressive measures will have a larger adverse effect on expenditures. Alaska. The impact of the PFD cut falls almost exclusively on residents, and it is highly regressive, so it has the largest adverse impact on the economy per dollar of revenues raised. The property tax is as regressive as the sales tax, but higher income taxpayers who pay larger property taxes can deduct the state tax from federal taxable income, and non-residents pay a higher proportion of sales taxes. However, it must be emphasized that our estimates of the effect of property taxes on expenditures are much more uncertain than the estimates for other types of taxes, due to the lack of information on non-resident property owners and the effect of property taxes on commercial property on the cost of living.

Although reducing the PFD is much more regressive than imposing a sales tax, especially a sales tax that excludes food at home and shelter, the sales taxes would actually cause a bigger drop in expenditures. The reason is that households with the lowest income, who lose the most with the PFD cut, do not have much money to spend to begin with.

Figure A-5

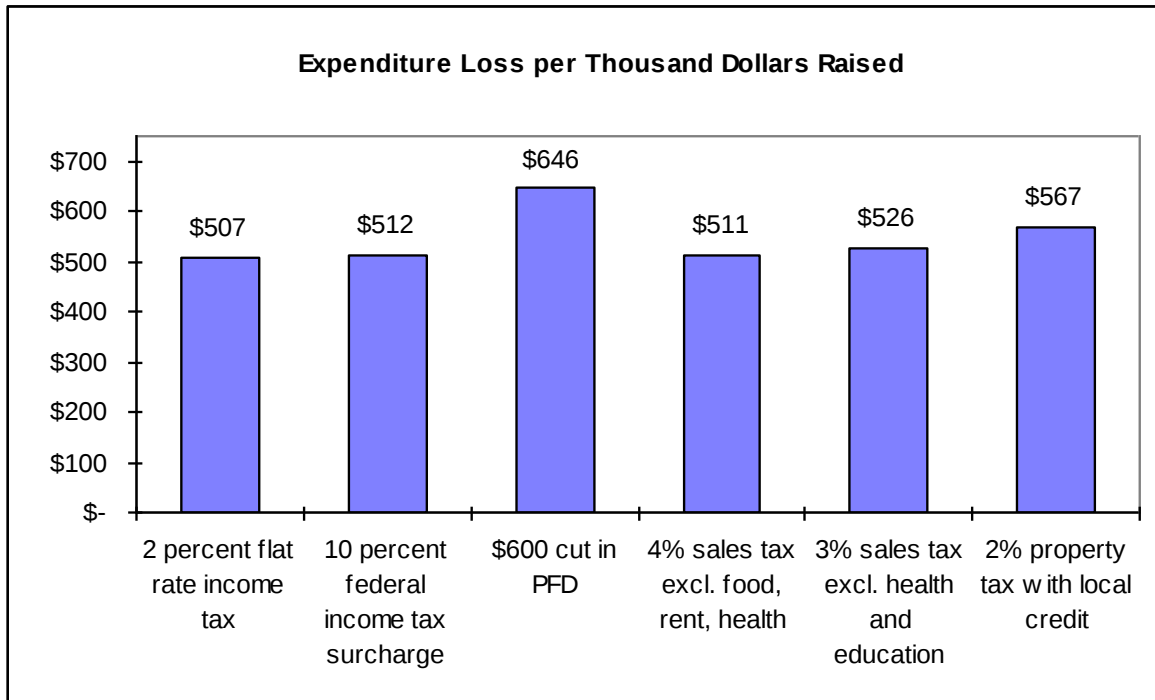


Table A-6 shows that the sensitivity of the different types of expenditures to the loss of disposable income from imposing the fiscal measures varies among the potential measures. Expenditures on health care and education are the most sensitive to disposable income loss. Food at home is not as sensitive as other goods and services. Shelter is the least sensitive, although the large reduction in disposable income for low income people from a sizable cut in the PFD could lead to a rise in homelessness. Another potential consequence of raising taxes to provide more revenue for state government is a reduction in prices for owner-occupied homes.

The expenditures covered in the CES do not include home purchases. A loss of disposable income is bound to have some adverse effect on housing markets. However, because the percentage reduction in disposable income for all the fiscal measures is relatively small for the upper half of the income distribution -- the households most likely to be considering buying a home -- the effect is likely to be small. Reductions in the state work force, for example, would be likely to have a much greater adverse effect on housing markets.

**Table A-6. Estimated Impact of Potential Revenue Measures
on Six Categories of Expenditures**

Total change in expenditures (\$000s)	2 percent flat rate income tax	10 percent federal income tax surcharge	\$600 cut in PFD	4% sales tax excl. food, rent, health	3% sales tax excl. health and education	2% property tax w local credit
Food at home	\$ (4,131)	\$ (3,387)	\$ (10,541)	\$ (4,976)	\$ (7,187)	\$ (14,337)
Other commodities	(49,511)	(44,267)	(71,593)	(48,409)	(61,606)	(125,102)
Services	(34,251)	(30,655)	(49,319)	(33,430)	(42,511)	(86,332)
Shelter	(327)	(267)	(921)	(407)	(603)	(1,199)
Health care	(36,604)	(38,258)	(21,753)	(26,617)	(29,103)	(59,742)
Education	(23,745)	(21,799)	(29,415)	(21,982)	(27,144)	(55,333)
Other items	(52,000)	(48,522)	(64,240)	(47,537)	(52,000)	(119,705)
Total	\$(200,571)	\$(187,156)	\$(247,781)	\$(183,358)	\$(200,571)	\$(461,749)
Reduction in expenditures per \$1,000 raised						
Food at home	\$ 10	\$ 9	\$ 27	\$ 14	\$ 17	\$18
Other commodities	125	121	187	135	143	154
Services	87	84	128	93	99	106
Shelter	1	1	2	1	1	1
Health care	93	105	57	74	67	73
Education	60	60	77	61	63	68
Other items	131	133	167	132	136	147
Total	\$ 507	\$ 512	\$ 646	\$ 511	\$ 526	\$567

**Distribution of Impacts of Increases in Excise Taxes
on Alcohol, Tobacco, and Petroleum Fuels**

Alaska already levies excise taxes on alcoholic beverages, tobacco products, and petroleum fuels. Broad-based sales taxes would be in addition to the excise taxes currently on the books. Increases in the excise taxes on these products represent a viable option for increasing state revenues. These products are included in the goods category, and any increase in the excise tax rates would have similar effects on the economy through changes in expenditures as general sales taxes, per dollar of revenue raised. However, the distribution of the effects on household disposable income of changes in excise taxes on these commodities likely differs from the distribution of effects of general sales taxes.

Current tax rates on alcohol are based on a rate of \$0.10 per drink, which translates to \$1.07 per gallon for beer, \$2.50 per gallon for wine, and \$12.80 per gallon for hard liquor. Small breweries get a substantial tax reduction. The alcohol tax raises about \$38 million per year, of which \$19 million comes from liquor sales, \$6 million from wine, and the remainder from beer. Although no solid data exist for Alaska, the tax is likely quite regressive. The CES does include alcoholic

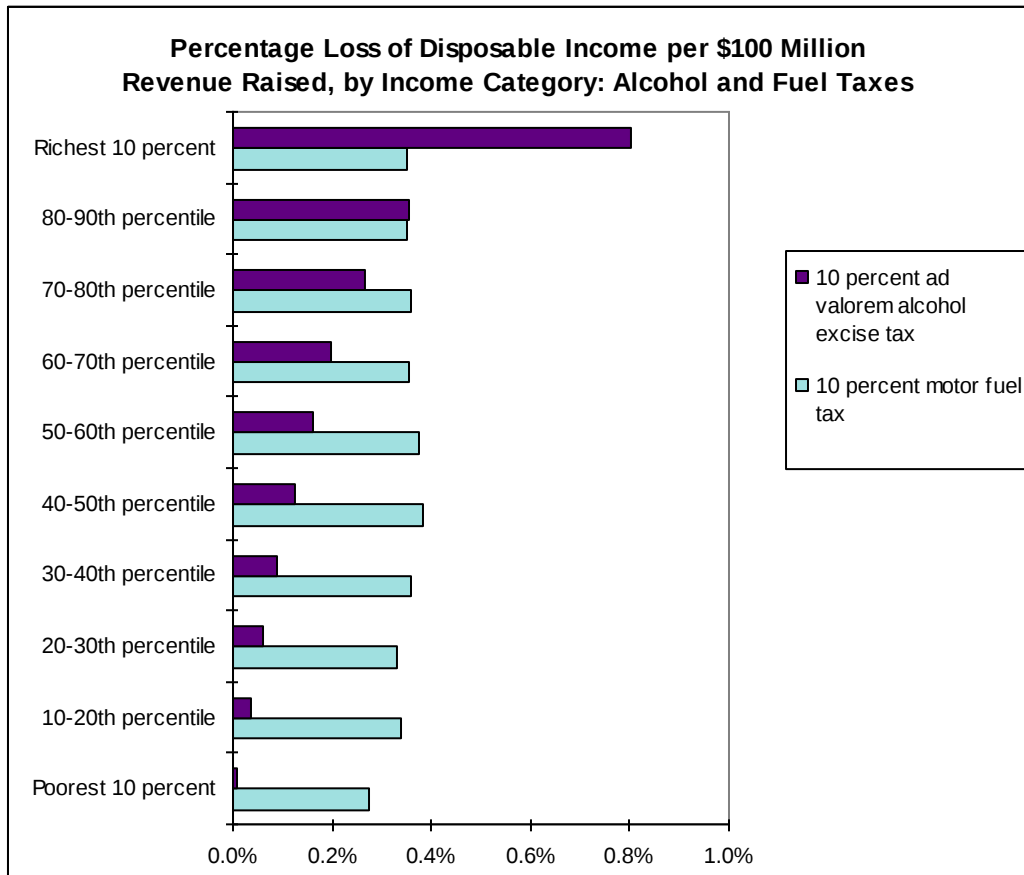
beverages as a subcategory of expenditures. Expenditure equations estimated for the Alaska CES sample, shown in Appendix Table B-7, indicate that the income elasticity of alcohol expenditures is greater than 1.0. This suggests that higher income households spend a greater proportion of their income on alcohol than lower income households. The difference is likely related to how higher income households purchase the product. More affluent households would be much more likely to purchase alcohol in restaurants, for example, where the retail price is much higher per drink than in liquor stores.

Alaska taxes motor fuels at a rate of \$0.0895, marine fuels at \$0.05 per gallon, aviation gasoline at \$0.047 and jet fuel at \$0.032 per gallon. The highway rate includes a surcharge of 0.95 cents per gallon effective July 1, 2015. Commercial enterprises pay a substantial portion of motor fuel taxes. The CES includes gasoline and motor oil as a subcategory of expenditures, which provides some data on how expenditures on gasoline vary with income. Expenditure equations estimated for motor fuels from the Alaska CES sample, shown in Appendix Table B-8, indicate that the income elasticity of fuel expenditures is approximately 1.0. This suggests that fuel expenditures are roughly proportional to per-capita household income. In Alaska at least, it does not appear that gasoline taxes would place a higher burden on low income households.

In Fiscal Year 2015, the state collected \$42 million from fuel taxes, and will likely collect \$45 million in 2016 with the surcharge. Even with the surcharge, Alaska fuel taxes are the lowest in the nation. According to the American Petroleum Institute, national average tax rates are 20.91 on gasoline and 20.17 on diesel. Counting all other taxes and fees including local sales taxes, total tax average 12.25 cents for gasoline and 12.75 cents for diesel. National averages are 30.28 for gasoline and 30.00 for diesel (American Petroleum Institute, State Motor Fuel Taxes by State, <http://www.api.org/~media/Files/Statistics/StateMotorFuel-OnePagers-January-2016.pdf>). An increase of 17.50 with a similar percentage rise in marine and aviation fuels would raise Alaska to the national average, and provide an estimated \$87 million per year of additional revenue. One could consider fuel taxes as a user fee to allow the state to recover its cost of operating, maintaining, and upgrading state highways, harbors, and airports. The current state budget for the portion of the Department of Transportation and Public Facilities dealing with transportation facilities exceeds \$200 million. Even if Alaska raised fuel taxes to the national average rates, the total fuel taxes paid of \$133 million would still fall far short of what it actually costs to maintain Alaska's transportation infrastructure, let alone the state's share of new highway construction and port expansion.

Figure A-6 illustrates the distribution of the tax burden among households of varying per-capita income for potential increases in alcohol and fuel taxes. The figure measures the distribution of effects as the percentage of income lost per \$100 million raised, the same benchmark as used for the broad-based revenue measures in Figure A-3. The alcohol tax considered is an “ad valorem” tax -- a constant percentage of the retail price -- rather than a constant amount per drink. The CES data suggest that an ad valorem alcohol tax would be quite progressive, while motor fuel taxes are relatively neutral with respect to income class.

Figure A-6



Alaska levies tobacco taxes at a rate based on a tax of \$2.00 per pack of cigarettes. Tobacco taxes collected \$65 million in 2015. The amount collected has been declining in recent years. The data from the Alaska sample of the CES indicate that only one in five Alaska households reported expenditures on tobacco products. The sample is too small to estimate an expenditure relationship reliably, but the data do indicate that the amount households do spend on tobacco purchases is not correlated with income. The downward trend of tax collections is partly due to the decline in tobacco use, but is also likely related to increased internet sales and other means that avoid paying Alaska’s relatively high tax. Because raising tobacco taxes would only increase the incentive for tobacco users to find ways to avoid the tax, raising tax rates would not necessarily increase state revenues collected. This problem, coupled with the fact that tobacco taxes are highly regressive, would recommend against increases in tobacco taxes as a measure to reduce the state budget deficit.

Comparison with Other Studies of Revenue Impacts

The Alaska Department of Revenue (DOR) has developed a fiscal model that estimates revenues that would be obtained from different revenue options. The model and revenue estimates for a number of revenue measures are summarized in “Potential Fiscal and Revenue Options for the Walker-Mallott Administration, Alaska Department of Revenue White Paper, 6/4/2015 (http://gov.alaska.gov/Walker_media/documents/20150605_potential-fiscal-and-revenue-

options.pdf). Two of the options investigated by the Department of Revenue -- a reduction in Permanent Fund Dividend payments and an income tax based on a state surcharge on federal individual income tax liabilities, are similar to the PFD and income tax surcharge proposals studied in this report. The estimates for the amount of revenue raised from these two measures presented here correspond closely to the DOR revenue estimates.

The DOR report also presents revenue estimates for a six percent state sales tax. DOR estimated that a 3 percent sales tax would raise \$418 million if food were included and \$358 million if food were excluded. The tax excluding food corresponds closely to our estimate of \$359 million (Table A-3). Our estimate of \$431 million is somewhat higher than the DOR estimate, but the tax base is also broader as it includes rent and utilities as well as food. The two studies, therefore, appear to estimate comparable revenues from sales taxes; however, it is difficult to compare the estimates without knowing the details on exactly what types of expenditures the DOR study included in their sales tax base.

An ISER study conducted in 1993 examined a number of options for raising state revenues and cutting spending, providing estimates of the distribution of effects that parallel those in the current study (Alexandra Hill and Matthew Berman, "Gaining and Losing Under State Fiscal Policies," ISER Fiscal Policy Papers, Number 8, December 1993, <http://www.iser.uaa.alaska.edu/Publications/formal/fppapers/fpp8.pdf>). The methods of the previous analysis were generally similar to those of the current study. The previous study estimated sales tax receipts and distribution using national expenditure data and assuming Alaska household expenditures had a similar distribution in relation to income as national expenditures. The 1993 study relied on 1990 Census data to develop the distribution of income and demographic profile of Alaska households.

In 1993, the study estimated that the PFD and Longevity Bonus (a state payment of up to \$250 per month to seniors) accounted for 25 percent of household income of the poorest ten percent of households. Although the Longevity Bonus is no longer in effect, the data in Table A-1 suggest that the PFD alone accounted for at least one fourth of income for the poorest 10 percent of households in 2013, and considerably more in 2015 when the PFD was substantially larger.

The state personal income tax in effect before 1990 was much more progressive than the current federal income tax structure, so that analysis had the richest 10 percent of households paying 3.1 percent of their income in tax, while we estimated that the 10 percent surcharge on federal taxes would reduce disposable income of the richest 10 percent by only about half that amount. At the upper end of the income distribution, the PFD provided a much higher share of income in 1993 than it does today. This reflects the rising income inequality in the United States over the past two decades, a trend that has also occurred in Alaska.

In addition to examining effects of income and sales taxes and PFD cuts on households at different points along the income distribution, the 1993 study also analyzed the regional effect of reductions in state and local government employment. Although the scope of the current study does not include the distributional effects of state spending cuts, the previous study's conclusion that rural Alaska communities were much more vulnerable to state budget cuts than urban areas undoubtedly still holds.

APPENDIX B

EXPENDITURE EQUATIONS ESTIMATED FROM THE CONSUMER EXPENDITURE SURVEY

As discussed in Appendix A, we used Consumer Expenditure Survey (CES) data to predict how much a family would spend on various categories of goods and services as a function of per-capita income and the number of people in the Consumer Unit (household size). We estimated both linear and loglinear relationships. The equations were estimated as censored regressions to address the fact that expenditures could not be negative. The loglinear specifications generally provided a better fit to the data, except in the case of education expenditures, for which the linear censored regression provided a more realistic prediction, probably due to the fact that relatively few households had education expenditures. We used these equations to estimate the tax base for sales taxes as well as the effect of various revenue measures on expenditures. Tables B-1 through B-8 display the complete statistical results of the equations.

Table B-1. Food at Home

Tobit regression				Number of observations	279
				Likelihood Ratio chi2(2)	56.31
				Prob > chi2	0.000
Log likelihood	-364.9			Pseudo R2	= 0.072
Log of food at home	Coef.	Std. Err.	t	P> t	95% Conf. Interval
Log of per-capita HH income	0.189	0.060	3.14	0.002	0.071 0.307
Log of household size	0.713	0.093	7.70	0.000	0.531 0.896
Constant	5.552	0.648	8.57	0.000	4.277 6.827
Sigma	0.814	0.035			0.746 0.882
Obs. summary:	2 left-censored observations at log food at home = 0 277 uncensored observations				

Table B-2. Goods

Tobit regression				Number of observations	279
				Likelihood Ratio chi2(2)	84.66
				Prob > chi2	0.000
Log likelihood	-496.8			Pseudo R2	= 0.079
Log of goods excluding food at home + 1	Coef.	Std. Err.	t	P> t	95% Conf. Interval
Log of per-capita HH income	0.819	0.097	8.46	0.000	0.628 1.010
Log of household size	0.995	0.149	6.67	0.000	0.702 1.289
Constant	-0.680	1.043	-0.65	0.515	-2.733 1.373
Sigma	1.310	0.056			1.199 1.421
Obs. summary:	4 left-censored observations at log goods = 0 275 uncensored observations				

Table B-3. Services

Tobit regression				Number of observations	279
				Likelihood Ratio chi2(2)	120.6
				Prob > chi2	0.000
Log likelihood	-434.8			Pseudo R2	= 0.122
Log of services + 1	Coef.	Std. Err.	t	P> t	95% Conf. Interval
Log of per-capita HH income	0.820	0.078	10.54	0.000	0.666 0.973
Log of household size	0.972	0.120	8.11	0.000	0.736 1.207
Constant	-0.828	0.837	-0.99	0.324	-2.477 0.820
Sigma	1.052	0.045			0.964 1.140
Obs. summary:	2 left-censored observations at log services = 0 277 uncensored observations				

Table B-4. Shelter

Tobit regression				Number of observations	279
				Likelihood Ratio chi2(2)	0.75
				Prob > chi2	0.687
Log likelihood	-445.1			Pseudo R2	= 0.001
Log of rent plus utilities and home maintenance + 1	Coef.	Std. Err.	t	P> t	95% Conf. Interval
Log of per-capita HH income	0.009	0.080	0.12	0.907	-0.149 0.168
Log of household size	0.107	0.124	0.87	0.387	-0.136 0.351
Constant	8.128	0.865	9.39	0.000	6..424 9..831
Sigma	1.087	0.047			0.996 1.179
Obs. summary:	3 left-censored observations at log shelter = 0 276 uncensored observations				

Table B-5. Health Care

Tobit regression				Number of observations	279
				Likelihood Ratio chi2(2)	64.32
				Prob > chi2	0.000
Log likelihood	-649.5			Pseudo R2	= 0.047
Log of health care + 1	Coef.	Std. Err.	t	P> t	95% Conf. Interval
Log of per-capita HH income	2.180	0.273	7.97	0.000	1.642 2.718
Log of household size	1.405	0.405	3.46	0.001	0.607 2.203
Constant	-18.22	2.965	-6.14	0.000	-24.05 -12.38
Sigma	3.445	1.777			3.096 3.795
Obs. summary:	64 left-censored observations at log of health care = 0 215 uncensored observations				

Table B-.6. Education

Tobit regression				Number of observations	279
				Likelihood Ratio chi2(2)	11.55
				Prob > chi2	0.003
Log likelihood	-683.9			Pseudo R2	= 0.008
Education	Coef.	Std. Err.	t	P> t	95% Conf. Interval
Per-capita HH income	0.0704	0.0354	1.99	0.048	0.001 0.140
Household size	3369	1101	3.06	0.002	1201 5537
Constant	-26854	4960	-5.41	0.000	-36618 -17090
Sigma	17251	1755			13795 20707
Obs. summary:	225 left-censored observations at education = 0 54 uncensored observations				

**Table B-7. Alcoholic Beverages
(Subcategory of Goods)**

Tobit regression		Number of observations		279		
		Likelihood Ratio chi2(2)		54.72		
		Prob > chi2		0.000		
Log likelihood	-570.0	Pseudo R2 =		0.046		
Log of acoholic beverages + 1	Coef.	Std. Err.	t	P> t	95% Conf. Interval	
Log of per-capita HH income	2.384	0.332	7.18	0.000	1.730	3.037
Log of household size	1.575	0.492	3.20	0.002	0.605	2.544
Constant	-23.19	3.620	-6.41	0.000	-30.32	-16.07
Sigma	4.012	0.244			3.532	4.492
Obs. summary:	111 left-censored observations at education = 0					
	168 uncensored observations					

**Table B-8. Gasoline and Motor Oil
(Subcategory of Goods)**

Tobit regression		Number of observations		279		
		Likelihood Ratio chi2(2)		109.1		
		Prob > chi2		0.000		
Log likelihood	-552.2	Pseudo R2 =		0.090		
Log of gas and oil + 1	Coef.	Std. Err.	t	P> t	95% Conf. Interval	
Log of per-capita HH income	1.146	0.123	9.30	0.000	0.903	1.388
Log of household size	1.557	0.189	8.25	0.000	1.186	1.928
Constant	-6.325	1.329	-4.76	0.000	-9.406	-3.710
Sigma	1.648	0.074			1.503	1.793
Obs. summary:	17 left-censored observations at education = 0					
	262 uncensored observations					

APPENDIX C

IMPLAN MODEL

To estimate short-run economic impacts, we used the IMPLAN input-output model. This appendix provides a brief overview of input-output modeling and the IMPLAN model. Appendix D provides details of how we used the IMPLAN model for this analysis.

Input-Output Modeling

An input-output model is a representation of the flows of economic activity between sectors within a region. The model captures what each business or sector must purchase from every other sector in order to produce a dollar's worth of goods or services. Using an input-output model, flows of economic activity associated with any change in spending may be traced either forwards (spending generating income which induces further spending) or backwards (industry purchases of fuel that leads refineries to purchase additional inputs – crude oil, utilities, etc.). Below is a brief summary of some of the most important terms used in input-output analysis.

Final demand is the term for sales to final consumers (households or government). Sales between industries are termed intermediate sales. Economic impact analysis generally estimates the regional economic impacts of final demand changes. Household spending is one type of final demand.

Direct effects are the changes in economic activity during the first round of spending. For transportation services this involves the impacts on the transportation industries (businesses selling directly to purchasers) themselves.

Secondary effects are the changes in economic activity from subsequent rounds of re-spending of transportation dollars. There are two types of secondary effects:

Indirect effects are the changes in sales, income or employment within the region in backward linked industries supplying goods and services to transportation businesses. The increased sales in truck tire supply firms resulting from more shipping services sales is an indirect effect of transportation spending.

Induced effects are the increased sales within the region from household spending of the income earned in transportation services and supporting industries. Employees in transportation services and supporting industries spend the income they earn on housing, utilities, groceries, and other consumer goods and services. This generates sales, income and employment throughout the region's economy.

Total effects are the sum of direct, indirect, and induced effects. Multipliers capture the size of the secondary effects in a given region, generally as a ratio of the total change in economic activity in the region relative to the direct change. Multipliers may be expressed as ratios of sales, income or employment, or as ratios of total income or employment changes relative to direct sales.

Multipliers express the degree of interdependency between sectors in a region's economy and therefore vary considerably across regions and sectors. Type I multipliers measure the direct and indirect effects of a change in economic activity. Unlike Type II or SAM multipliers (discussed below), they do not include induced effects. They capture the inter-industry effects only, i.e., industries buying from local industries.

IMPLAN Model

To estimate short-run economic impacts, we used the proprietary IMPLAN input-output model (<http://www.implan.com/>). The most important component of IMPLAN is an input-output dollar flow table. For a specified region, the input-output table accounts for all dollar flows between different sectors of the economy. Using this information, IMPLAN models the way a dollar injected into one sector is spent and re-spent in other sectors of the economy, generating waves of economic activity, or so-called “economic multiplier” effects. The model uses national industry data and county-level economic data to generate a series of multipliers, which in turn estimate the total economic implications of economic activity. The inclusion of the Social Accounting Matrix (SAM) allows the measurement of economic relationships between government, industry, and household sectors, allowing IMPLAN to model transfer payments such as unemployment insurance.

We used the IMPLAN¹ software version (3.1) which contains 2013 data for our analysis. This model contains 299 industries, and 9 income group categories for the state of Alaska. Table C-1 (on the following page) provides summary data for the Alaska model.

IMPLAN Data Sources

The input-output model generated by IMPLAN requires data from multiple sources. Below we describe the most important sources of data.

Employment

In general, BLS' Covered Employment and Wages (CEW)² data provide the county-level industry structure for the IMPLAN database. The Census Bureau's County Business Patterns (CBP) data are used to estimate non-disclosed values, while the regional economic (REA)³ data is used for control totals (to incorporate proprietors and non-covered sectors⁴).

Employee compensation describes the total payroll costs (including benefits) of each industry in the region. It includes the wages and salaries of workers who are paid by employers, as well as benefits such as health and life insurance, retirement payments, and non-cash compensation.

¹ See the Glossary of Terms below and IMPLAN overview here:
<http://www.ci.richmond.ca.us/documentcenter/home/view/6474>

² Bureau of Labor Statistics: http://www.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables

³Bureau of Economic Analysis: <http://www.bea.gov/regional/>

⁴ Since these data only capture covered employees, the data set cannot capture self-employed persons, railway employment, religious organizations, military, elected officials or any other establishments that have their own social insurance program and/or do not pay into the Unemployment Insurance program. Since most farm employment is self-employment, CEW data miss much of the farm data.

Employee compensation is derived for each industry from ES202⁵ and Regional Economic Information System Employment (REIS) data.

Table C-1: Overview of IMPLAN

Model Year	2013
GRP (Gross Regional Product)	\$64,776,426,833
Total Personal Income	\$36,779,760,000
Total Employment	488,575
Number of Industries	299
Population	735,132
Total Households	262,327
Average Household Income	\$140,206
<i>Value Added</i>	
Employee Compensation	\$28,376,414,336
Proprietor Income	\$3,874,819,622
Other Property Type Income	\$24,512,101,981
Tax on Production and Import	\$8,013,090,894
<u>Total Value Added</u>	<u>\$64,776,426,833</u>
<i>Final Demand</i>	
Households	28,629,722,314
State/Local Government	\$9,936,276,378
Federal Government	\$10,243,953,265
Capital	\$8,388,415,723
Exports	\$41,848,452,645
Imports	-\$32,411,848,922
Institutional Sales	-\$1,858,544,524
<u>Total Final Demand:</u>	<u>\$64,776,426,879</u>

Households

National household Personal Consumption Expenditures (PCE) are estimated using the Bureau of Economic Analysis (BEA) Benchmark I-O-to-PCE bridge tables and current National Income and Product Accounts (NIPA) PCE data. National PCE are distributed to states and counties based on the number of households and household income for each of the nine income categories. The spending patterns for each of the nine household income categories were created using the BLS Consumer Expenditure Survey.

Household income is based on the Bureau of Economic Analysis (BEA) “Personal Income” numbers reported by the Regional Economic Information System (REIS) in the CA5 tables – Personal Income and controlled to current BEA National Income and Product Accounts (NIPA) for the nation.

⁵ Employment and Wage (ES-202) data are derived from reports filed by all employers subject to unemployment compensation laws, both state and federal. Industry employment and payroll information is produced both quarterly and annually for the state, labor market areas, workforce investment areas, cities and towns, and counties. NAICS based employment and wage data are available beginning with the first quarter of 2001. Use the query tool below to obtain Employment and Wage data by area and industry. http://lmi2.detma.org/lmi/lmi_es_a.asp

Government

Federal sales and expenditures data are estimated using NIPA control totals and the Benchmark I-O distribution, with the exception of the timber sales data, which are from the U.S. Forrest Service. Data for State and Local Government sales are obtained from the current Annual Survey of Governments: Finances data series, while State and Local Government expenditures are estimated using NIPA control totals and the Benchmark I-O distribution.

Social Accounting Matrix

Social Accounting Matrix (SAM) accounts are an extension of traditional input output accounts. Like input-output analysis, a full social accounting matrix is a double entry booking system capable of tracing monetary flows through debits and credits similar to T-Accounts in basic financial accounting. The matrix format allows the double entry bookkeeping to be displayed in a single entry format. The column entries represent expenditures (payments) made by the economic agents. The row entries represent receipts or income to agents. By accounting definition, all receipts must equal all expenditures. A SAM with complete accounting of flows actually serves as a check for IMPLAN data since a SAM gives a complete picture of taxation and savings for households and governments.

The U.S. SAM data come directly from the National Income and Product Accounts. State and county SAM data is derived from a number of sources. The IMPLAN data contributes a large portion of the local area data. All inter-industry information is derived from the MIG IMPLAN databases. IMPLAN gives the SAM the use and make tables, the factor receipts, and the commodities purchased by institutions. Other SAM elements are derived from a variety of sources.

Estimates of household income and expenditure transfers come from four primary sources. The first is the IMPLAN industry data. The second is the REIS CA 35 Table. The third is from the BLS Consumer and the fourth is the Annual Survey of Government Finances. Household income received from industries is from the IMPLAN data. This income is by place of work, and is income received by individuals where they perform the work. Social accounting data is by definition place-of-residence. The REIS data provides the residency adjustment. Household income is adjusted for place-of-residence so it is consistent with other sources of household income. Residence-based household income is derived from the Bureau of Economic Analysis (BEA)'s Regional Economic Information System (REIS) data. REIS has estimates of income by place of work and place of residence, as well as some transfer payments data. Household expenditures on federal taxes are from the CES data distributed to states and counties on the basis of the area's demographic makeup.

APPENDIX D

ESTIMATION OF SHORT-RUN ECONOMIC IMPACTS

This appendix provides technical documentation for our estimation of short-term economic impacts of Alaska fiscal options.

“High” Scenarios for Economic Impacts

As discussed in Chapter II and Appendix A, we analyzed two scenarios for how fiscal options might affect household spending, based on different assumptions estimated from different data sources. We refer to these as the “high” scenario (based on assumptions embedded in the IMPLAN model) and the “low” scenario (based on assumptions estimated from Census income data). The “high” scenario assumptions generally result in higher estimated impacts of the fiscal options on Alaska household spending and correspondingly higher multiplier economic impacts than the “low” scenario options.

In this appendix, we first discuss the estimated impacts for “high” scenario. All of the following analysis and discussion prior to the section of the appendix named “Low Scenarios for Economic Impacts” (including all of the tables through Table D-12) refers to our analysis for the “high” scenario.

IMPLAN Model Assumptions for Spending Cut Options

Spending Cut: Workers

We modeled the impacts of removing 1300 jobs from the sector named employment and payroll of state government employment (IMPLAN sector number 531). This sector consists of workers typically employed in Parks & Recreation, Health, Hospitals, Police, Judicial and Legal, Financial Administrative, Highways, Public Welfare, Fire Protection, Natural Resources, Corrections, Libraries, and Social Insurance. These jobs are associated with a total output of \$135,162,159 in output and total labor income of \$128,443,783.

Spending Cut: Broad-Based

We modeled the impacts of removing \$100 million from the spending of a sector named other state government enterprises. This sector consists of Sewerage, Water Supply, Gas Supply, Airports, Water trans. & terminals, and Housing & Community Development.

Spending Cut: Capital

We modeled the impacts of reducing spending by \$60 million in a sector named construction in new commercial structures and reducing spending by \$40 million in a sector named construction in other non-residential structures. We used this weighted average of spending reductions for two sectors to reflect the fact that the labor intensity of different types of capital spending differs.

Spending Cut: Pay

We modeled the impacts of a \$100 million decrease in employee compensation. We model these similarly to how we model the impacts of taxes and dividend cuts, described below. The impacts are driven by assumed changes in spending resulting from the decrease in employee compensation, after adjusting for payroll taxes, social insurance taxes, personal taxes and savings.

IMPLAN Model Assumptions for Tax and Dividend Cut Options

To develop IMPLAN model assumptions for the income tax, sales tax and dividend cut fiscal options, we used the methodology discussed in Appendix A to derive the following estimates of total income raised by each fiscal option, by residency. Note that these are the same estimates as those shown in Appendix A, Table A-3.

Table D-1

Estimated Total Revenue Raised, by Residency (\$000)

Fiscal option	10% federal income tax surcharge	2% flat rate income tax	4 % sales tax excluding food at home, shelter, health care & education	3% sales tax excluding health care & education	20 mil (2%) property tax with local credit	\$600 cut in PFD
Residents	\$338,847	\$366,442	\$317,970	\$388,218	\$791,832	\$380,019
Non-residents	\$27,033	\$29,234	\$41,198	\$42,998	\$22,810	\$3,800
Total	\$365,880	\$395,676	\$359,168	\$431,215	\$814,642	\$383,819
Resident share	92.6%	92.6%	88.5%	90.0%	97.2%	99.0%
Non-resident share	7.4%	7.4%	11.5%	10.0%	2.8%	1.0%

We also used the methodology discussed in Appendix A to estimate the following estimates of revenue which would be raised from Alaska residents, by income group:

Table D-2

Estimated Revenue Raised from Residents, by Income Group (\$000)

Income group	10% federal income tax surcharge	2% flat rate income tax	4 % sales tax excluding food at home, shelter, health care & education	3% sales tax excluding health care & education	20 mil (2%) property tax with local credit	\$600 cut in PFD
lowest 10 percent	\$976	\$1,888	\$7,626	\$19,706	\$37,889	\$48,027
10-20 percent	\$3,108	\$5,520	\$16,439	\$27,411	\$49,717	\$46,265
20-30 percent	\$5,843	\$9,594	\$18,889	\$28,661	\$53,458	\$39,236
30-40 percent	\$11,940	\$18,232	\$25,751	\$34,847	\$74,088	\$43,552
40-50 percent	\$18,625	\$25,480	\$31,284	\$39,082	\$81,806	\$43,900
50-60 percent	\$25,808	\$32,938	\$34,663	\$41,560	\$86,311	\$40,340
60-70 percent	\$28,427	\$35,777	\$35,202	\$41,521	\$88,707	\$34,740
70-80 percent	\$36,652	\$43,038	\$40,368	\$45,248	\$96,478	\$32,880
80-90 percent	\$48,862	\$51,275	\$44,450	\$48,089	\$98,252	\$29,559
highest 10 percent	\$106,255	\$88,335	\$63,299	\$62,092	\$125,128	\$24,650
Total	\$286,496	\$312,076	\$317,970	\$388,218	\$791,832	\$383,149

Note that the totals for revenues raised from residents vary between Tables D-1 and D-2 for the income tax and the dividend cut options, particularly for the progressive (10% federal income tax surcharge) option. The income tax is non-linear because of the progressive rates. The IRS data has enough information to enable us to estimate the total taxes collected. The average household per-capita income in the percentiles is not the same as for the IRS distribution of taxpayers, and there is no way to adjust for this perfectly. That is why the average amounts collected per decile don't exactly add to the total. The total is more accurate. With sales taxes, there is neither the progressive structure nor the ability to estimate the total tax, so we used the weighted average of the percentiles to estimate the total, which is why the total does equal the sum.

From Table D-2, we calculated the shares of revenues raised from residents by income group:

Table D-3
Estimated Share of Revenue Raised from Residents, by Income Group (%)

Fiscal option	10% federal income tax surcharge	2% flat rate income tax	4 % sales tax excluding food at home, shelter, health care & education	3% sales tax excluding health care & education	20 mil (2%) property tax with local credit	\$600 cut in PFD
lowest 10 percent	0.34%	0.60%	2.40%	5.08%	4.78%	12.53%
10-20 percent	1.08%	1.77%	5.17%	7.06%	6.28%	12.07%
20-30 percent	2.04%	3.07%	5.94%	7.38%	6.75%	10.24%
30-40 percent	4.17%	5.84%	8.10%	8.98%	9.36%	11.37%
40-50 percent	6.50%	8.16%	9.84%	10.07%	10.33%	11.46%
50-60 percent	9.01%	10.55%	10.90%	10.71%	10.90%	10.53%
60-70 percent	9.92%	11.46%	11.07%	10.70%	11.20%	9.07%
70-80 percent	12.79%	13.79%	12.70%	11.66%	12.18%	8.58%
80-90 percent	17.06%	16.43%	13.98%	12.39%	12.41%	7.71%
highest 10 percent	37.09%	28.31%	19.91%	15.99%	15.80%	6.43%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

For our IMPLAN model assumptions, we needed to estimate the changes in expenditures which would result from collecting the total revenue collections shown in Table D-1. We had no data on the distribution of income of the non-residents from whom revenues would be collected. We therefore assumed that the shares of different income groups would be the same for total revenue collections (and therefore implicitly for non-resident revenue collections) as the shares for resident revenue collections shown in Table D-3 above.

We then estimated the total revenue collections by income group (from residents and non-residents combined) shown in Table D-4, by multiplying the income group shares in Table D-3 by the total revenue collections shown in the bottom row of Table D-1:

Table D-4

Assumed Total Revenue Raised by Income Group: Income Tax, Sales Tax and Dividend Cut Options (\$000)

Income group	10% federal income tax surcharge	2% flat rate income tax	4 % sales tax excluding food at home, shelter, health care & education	3% sales tax excluding health care & education	20 mil (2%) property tax with local credit	\$600 cut in PFD
lowest 10 percent	\$1,246	\$2,393	\$8,614	\$21,889	\$38,980	\$48,111
10-20 percent	\$3,970	\$6,999	\$18,569	\$30,447	\$51,149	\$46,346
20-30 percent	\$7,463	\$12,164	\$21,336	\$31,836	\$54,998	\$39,305
30-40 percent	\$15,249	\$23,116	\$29,087	\$38,706	\$76,222	\$43,629
40-50 percent	\$23,786	\$32,305	\$35,337	\$43,411	\$84,163	\$43,977
50-60 percent	\$32,958	\$41,761	\$39,154	\$46,163	\$88,797	\$40,410
60-70 percent	\$36,303	\$45,361	\$39,763	\$46,120	\$91,262	\$34,801
70-80 percent	\$46,808	\$54,567	\$45,598	\$50,260	\$99,257	\$32,938
80-90 percent	\$62,401	\$65,011	\$50,209	\$53,416	\$101,082	\$29,610
highest 10 percent	\$135,696	\$111,999	\$71,501	\$68,969	\$128,733	\$24,693
Total	\$365,880	\$395,676	\$359,168	\$431,215	\$814,642	\$383,819

We next estimated the assumed spending reductions resulting from the income losses shown in Table D-3. To do this we began by calculating the assumed spending reductions per dollar of lost income, shown in table D-5.

Table D-5

**Assumed Spending Reduction
Per Dollar of Lost Income**

Income Group	Reduction
lowest 10 percent	\$1.00
10-20 percent	\$1.00
20-30 percent	\$1.00
30-40 percent	\$1.00
40-50 percent	\$1.00
50-60 percent	\$1.00
60-70 percent	\$0.95
70-80 percent	\$0.88
80-90 percent	\$0.71
highest 10 percent	\$0.51

We derive these by assuming that the share of a dollar of income that is spent is the share that is not devoted to savings or taxes. Put differently, a dollar reduction in income results in spending reductions which equal to 1 minus (savings + taxes).

In order to derive how much each income group allocates to taxes and savings, we do the following. To generate flows from households to government (taxes) we divide distributions from each income group to government (Federal Government Non-Defense (code 11001)), (State/Local Gov't non-education, and 12001)) by the overall spending (Total). To generate how much households are allocating to their savings, we divide the amount they allocate to capital (14001) by the overall income (Total).

Lower income households receive distributions from the government which become part of their overall incomes. For these income groups, a dollar income reduction is assumed to lead to a dollar in spending reductions.

We multiplied the estimates of total revenues collected by group in Table D-4 by the assumed spending reductions per dollar of lost income in Table D-5 to estimate the assumed expenditure reductions by income group shown in Table D-6:

Table D-6

Assumed Expenditure Reduction by Income Group: Income Tax, Sales Tax and Dividend Cut Options (\$000)

Income group	10% federal income tax surcharge	2% flat rate income tax	4 % sales tax excluding food at home, shelter, health care & education	3% sales tax excluding health care & education	20 mil (2%) property tax with local credit	\$600 cut in PFD
lowest 10 percent	\$1,246.27	\$2,393	\$8,614	\$21,889	\$38,980	\$48,111
10-20 percent	\$3,970	\$6,999	\$18,569	\$30,447	\$51,149	\$46,346
20-30 percent	\$7,463	\$12,164	\$21,336	\$31,836	\$54,998	\$39,305
30-40 percent	\$15,249	\$23,116	\$29,087	\$38,706	\$76,222	\$43,629
40-50 percent	\$23,786	\$32,305	\$35,337	\$43,411	\$84,163	\$43,977
50-60 percent	\$32,958	\$41,761	\$39,154	\$46,163	\$88,797	\$40,410
60-70 percent	\$34,488	\$43,093	\$37,775	\$43,814	\$86,699	\$33,061
70-80 percent	\$41,191	\$48,019	\$40,127	\$44,228	\$87,346	\$28,985
80-90 percent	\$44,305	\$46,158	\$35,648	\$37,925	\$71,768	\$21,023
highest 10 percent	\$69,205	\$57,119	\$36,465	\$35,174	\$65,654	\$12,593
Total	\$273,861	\$313,127	\$302,112	\$373,593	\$705,776	\$357,440

IMPLAN Estimates for Fiscal Options

To save space in the following tables, and also to simplify the tables in other parts of this report, in the remainder of this Appendix and in other parts of this report we use the following “short names” for the fiscal options for which we estimated short-run economic impacts:

Table D-7
Fiscal Option Names

Full name	Short name
Used in Appendix A and earlier parts of Appendix D	Used in Executive Summary and report chapters
Spending cut: workers	Spending cut: workers
Spending cut: broad-based	Spending cut: broad-based
Spending cut: capital	Spending cut: capital
Spending cut: pay	Spending cut: pay
10% federal income tax surcharge	Income tax: progressive
2% flat rate income tax	Income tax: flat rate
4% sales tax excluding food at home, shelter, health care & education	Sales tax: more exclusions
3% sales tax excluding health care & education	Sales tax: fewer exclusions
20 mil (2%) property tax with local credit	Property tax
\$600 cut in PFD	Dividend cut
Saving less	Saving less

Table D-8 summarizes our IMPLAN estimates of the direct, indirect, induced and total impacts of each fiscal option that we analyzed on employment, labor income, total value added, and output. Note that these are estimated impacts before adjusting for \$100 million of deficit reduction to facilitate comparison of the relative economic impacts of different options, and before adjusting for the shares of tax and dividend cut income reductions experienced by Alaska residents. Put differently, the estimates show what the total estimated economic impacts would be if we assumed that the impacts of the tax and dividend options were the same as if all revenues were collected from Alaska residents.

Table D-8
Estimated Economic Impacts of Fiscal Options
(Before Adjustments for \$100 Million of Deficit Reduction or for Residency)

Fiscal Option	Impact	Employment	Labor Income	Total Value Added	Output
Spending cut: workers	Direct Impact	1,300	\$128,443,783	\$135,162,163	\$135,162,159
	Indirect Impact	0	\$0	\$0	\$0
	Induced Impact	967	\$57,834,399	\$91,080,286	\$140,242,201
	Total Impact	2,267	\$186,278,182	\$226,242,449	\$275,404,360
Spending cut: broad-based	Direct Impact	504	\$67,465,139	\$64,180,716	\$99,999,998
	Indirect Impact	165	\$12,590,276	\$18,075,711	\$32,541,789
	Induced Impact	589	\$35,095,126	\$55,496,950	\$85,651,702
	Total Impact	1,260	\$115,150,542	\$137,753,378	\$218,193,489
Spending cut: capital	Direct Impact	506	\$41,660,828	\$48,689,461	\$100,000,000
	Indirect Impact	159	\$10,380,857	\$15,531,755	\$29,027,814
	Induced Impact	266	\$11,893,924	\$22,463,822	\$35,772,456
	Total Impact	931	\$63,935,610	\$86,685,039	\$164,800,273
Spending cut: pay	Direct Impact	0	\$0	\$0	\$0
	Indirect Impact	0	\$0	\$0	\$0
	Induced Impact	727	\$43,293,555	\$68,379,638	\$105,397,277
	Total Impact	727	\$43,293,555	\$68,379,638	\$105,397,277
10% federal income tax surcharge	Direct Impact	0	\$0	\$0	\$0
	Indirect Impact	0	\$0	\$0	\$0
	Induced Impact	3,107	\$179,068,073	\$288,589,000	\$452,448,266
	Total Impact	3,107	\$179,068,073	\$288,589,000	\$452,448,266
2 percent flat rate income tax	Direct Impact	0	\$0	\$0	\$0
	Indirect Impact	0	\$0	\$0	\$0
	Induced Impact	3,409	\$195,220,936	\$316,654,054	\$497,295,126
	Total Impact	3,409	\$195,220,936	\$316,654,054	\$497,295,126
4% sales tax excl. food, rent, health	Direct Impact	0	\$0	\$0	\$0
	Indirect Impact	0	\$0	\$0	\$0
	Induced Impact	3,145	\$178,782,037	\$291,685,082	\$459,844,684
	Total Impact	3,145	\$178,782,037	\$291,685,082	\$459,844,684
3% sales tax excl. health, education	Direct Impact	0	\$0	\$0	\$0
	Indirect Impact	0	\$0	\$0	\$0
	Induced Impact	3,807	\$215,465,761	\$352,884,720	\$557,074,004
	Total Impact	3,807	\$215,465,761	\$352,884,720	\$557,074,004
20 mil (2%) property tax with local credit	Direct Impact	0	\$0	\$0	\$0
	Indirect Impact	0	\$0	\$0	\$0
	Induced Impact	7,160	\$405,917,294	\$663,662,796	\$1,046,740,407
	Total Impact	7,160	\$405,917,294	\$663,662,796	\$1,046,740,407
\$600 cut in PFD	Direct Impact	0	\$0	\$0	\$0
	Indirect Impact	0	\$0	\$0	\$0
	Induced Impact	3,458	\$193,593,641	\$320,190,281	\$507,127,459
	Total Impact	3,458	\$193,593,641	\$320,190,281	\$507,127,459

Table D-9 shows the corresponding estimates of the direct, indirect, induced and total impacts of each fiscal option after adjusting for \$100 million of deficit reduction, to facilitate comparison of the relative economic impacts of different options. Note that, as with Table D-8, these estimates are not adjusted for the shares of tax and dividend cut income reductions experienced by Alaska residents. Put differently, they show the estimated economic impacts per \$100 million of deficit reduction if we assumed that the impacts of the tax and dividend options were the same as if all revenues were collected from Alaska residents.

Table D-9
Estimated Economic Impacts of Fiscal Options Per \$100 Million of Deficit Reduction
(before adjustments for residency)

Fiscal Option	Deficit reduction	Adjustment factor*	Impact	Employment	Labor Income	Total Value Added	Output
Spending cut: workers	\$135,162,159	0.7399	Direct Impact	962	\$95,029,396	\$100,000,003	\$100,000,000
			Indirect Impact	0	\$0	\$0	\$0
			Induced Impact	715	\$42,788,898	\$67,385,936	\$103,758,479
			Total Impact	1,677	\$137,818,294	\$167,385,939	\$203,758,479
Spending cut: broad-based	\$100,000,000	1.0000	Direct Impact	504	\$67,465,139	\$64,180,716	\$99,999,998
			Indirect Impact	165	\$12,590,276	\$18,075,711	\$32,541,789
			Induced Impact	589	\$35,095,126	\$55,496,950	\$85,651,702
			Total Impact	1,260	\$115,150,542	\$137,753,378	\$218,193,489
Spending cut: capital	\$100,000,000	1.0000	Direct Impact	506	\$41,660,828	\$48,689,461	\$100,000,000
			Indirect Impact	159	\$10,380,857	\$15,531,755	\$29,027,814
			Induced Impact	266	\$11,893,924	\$22,463,822	\$35,772,456
			Total Impact	931	\$63,935,610	\$86,685,039	\$164,800,273
Spending cut: pay	\$100,000,000	1.0000	Direct Impact	0	\$0	\$0	\$0
			Indirect Impact	0	\$0	\$0	\$0
			Induced Impact	727	\$43,293,555	\$68,379,638	\$105,397,277
			Total Impact	727	\$43,293,555	\$68,379,638	\$105,397,277
10% federal income tax surcharge	\$365,880,435	0.2733	Direct Impact	0	\$0	\$0	\$0
			Indirect Impact	0	\$0	\$0	\$0
			Induced Impact	849	\$48,941,691	\$78,875,221	\$123,660,142
			Total Impact	849	\$48,941,691	\$78,875,221	\$123,660,142
2 percent flat rate income tax	\$395,676,227	0.2527	Direct Impact	0	\$0	\$0	\$0
			Indirect Impact	0	\$0	\$0	\$0
			Induced Impact	861	\$49,338,556	\$80,028,577	\$125,682,336
			Total Impact	861	\$49,338,556	\$80,028,577	\$125,682,336
4% sales tax excl. food, rent, health	\$359,168,203	0.2784	Direct Impact	0	\$0	\$0	\$0
			Indirect Impact	0	\$0	\$0	\$0
			Induced Impact	876	\$49,776,688	\$81,211,276	\$128,030,455
			Total Impact	876	\$49,776,688	\$81,211,276	\$128,030,455
3% sales tax excl. health, education	\$431,215,334	0.2319	Direct Impact	0	\$0	\$0	\$0
			Indirect Impact	0	\$0	\$0	\$0
			Induced Impact	883	\$49,967,092	\$81,834,919	\$129,186,965
			Total Impact	883	\$49,967,092	\$81,834,919	\$129,186,965
20 mil (2%) property tax with local credit	\$814,642,218	0.1228	Direct Impact	0	\$0	\$0	\$0
			Indirect Impact	0	\$0	\$0	\$0
			Induced Impact	879	\$49,827,690	\$81,466,803	\$128,490,847
			Total Impact	879	\$49,827,690	\$81,466,803	\$128,490,847
\$600 cut in PFD	\$383,819,073	0.2605	Direct Impact	0	\$0	\$0	\$0
			Indirect Impact	0	\$0	\$0	\$0
			Induced Impact	901	\$50,438,776	\$83,422,191	\$132,126,696
			Total Impact	901	\$50,438,776	\$83,422,191	\$132,126,696

* Adjustment factor for the estimates in Table D-8, to convert to estimated economic impacts per \$100 million of deficit reduction. Calculated by dividing \$100 million by the deficit reduction shown in the second column.

Table D-10 summarizes the estimated short-run economic impacts of each fiscal option on income and employment, before adjustments before residency. We use the term “multiplier impacts” to refer to the sum of indirect and induced impacts.

Table D-10
Estimated Short-Run Economic Impacts of Selected Options for Reducing the Deficit by \$100 Million
(before adjustments for residency)

Option	Income Impacts (millions of \$ of income)				Employment Impacts (FTE jobs in Alaska)		
	Direct earned	Direct other	Multiplier	Total	Direct	Multiplier	Total
Spending cut: workers	95.0		42.8	137.8	962	715	1677
Spending cut: broad-based	67.5		47.7	115.2	504	754	1260
Spending cut: capital	41.7		22.3	63.9	506	425	931
Spending cut: pay	100.0		43.3	143.3	0	727	727
Income tax: progressive		100.0	48.9	148.9	0	849	849
Income tax: flat rate		100.0	49.3	149.3	0	861	861
Sales tax: more exclusions		100.0	49.8	149.8	0	876	876
Sales tax: fewer exclusions		100.0	50.0	150.0	0	883	883
Property tax		100.0	49.8	149.8	0	879	879
Dividend cut		100.0	50.4	150.4	0	901	901
Saving less				0.0			0

The direct employment impacts shown for the first three spending cut options are the same as those shown in Table D-9: only these three options have direct employment impacts.

The “direct earned income” impacts shown for the first three spending cut options are the same as the “direct labor income” impacts shown in Table D-9.

The \$100 million impact on “direct other” income for the five tax and dividend cut options shown in the lower half of Table D-10 represents the loss of income from the assumed \$100 million reduction in the deficit (assuming that this was entirely lost resident income). Although we show a direct earned impact of \$100 million for the “Spending cut: pay” option, we actually estimate the income impacts of this option in the same way as we do for the “direct other” income impacts of the tax and dividend cut options (as multiplier impacts resulting from expenditure reductions resulting from the lost income).

The multiplier employment and income impacts shown in Table D-10 are the sums of the indirect and induced impacts shown in Table D-9. The total impacts are the sums of the direct and multiplier impacts shown in Table D-10.

Note that the bottom row of Table D-10 shows zero short-run economic impacts of “saving less”. This option refer to saving less of annual Permanent Fund realized earnings in the Permanent Fund principal (as inflation proofing) or in the Permanent Fund earnings reserve (as additions to the earnings reserve). Although saving less would reduce future growth of the Permanent Fund

and thus would reduce future earnings, it would not remove any income or jobs from the economy in the short-run and would have no short-run economic impacts.

Table D-11 shows the assumed share of revenues that would be paid by residents. These are the same shares as shown above in Table D-1.

Table D-11
Assumed Share of Revenues Paid by Residents

Option	Share
Spending cut: workers	100.0%
Spending cut: broad-based	100.0%
Spending cut: capital	100.0%
Spending cut: pay	100.0%
Income tax: progressive	92.6%
Income tax: flat rate	92.6%
Sales tax: more exclusions	88.5%
Sales tax: fewer exclusions	90.0%
Property tax	97.2%
Dividend cut	99.0%
Saving less	NA

Table D-12 summarizes the estimated short-run economic impacts of each fiscal option on income and employment, after adjusting for residency by multiplying the impacts shown in Table D-10 by the resident shares shown in Table D-11. We use the term “multiplier impacts” to refer to the sum of indirect and induced impacts. These are the estimates of short-run economic impacts which we report in the Executive Summary and in Chapter III.

Table D-12
Estimated Short-Run Economic Impacts of Selected Options for Reducing the Deficit by \$100 Million
(after adjustments for residency)

Option	Income Impacts (millions of \$ of income)				Employment Impacts (FTE jobs in Alaska)		
	Direct earned	Direct other	Multi- plier	Total	Direct	Multi- plier	Total
Spending cut: workers	95.0		42.8	137.8	962	715	1677
Spending cut: broad-based	67.5		47.7	115.2	504	754	1260
Spending cut: capital	41.7		22.3	63.9	506	425	931
Spending cut: pay	100.0		43.3	143.3	0	727	727
Income tax: progressive		92.6	45.3	137.9	0	786	786
Income tax: flat rate		92.6	45.7	138.3	0	798	798
Sales tax: more exclusions		88.5	44.1	132.6	0	775	775
Sales tax: fewer exclusions		90.0	45.0	135.0	0	795	795
Property tax		97.2	48.4	145.6	0	854	854
Dividend cut		99.0	49.3	148.3	0	870	870
Saving less				0.0			0

Note that this residency adjustment implies the assumption that the tax and dividend cut options impact the economy only because of their impacts on resident income and expenditures: impacts on non-resident incomes are not assumed to result in any impact on non-resident expenditures in Alaska.

“Low” Scenarios for Economic Impacts

As discussed in Chapter II and Appendix A, we analyzed two scenarios for how fiscal options might affect household spending, based on different assumptions estimated from different data sources. We refer to these as the “high” scenario (based on assumptions embedded in the IMPLAN model) and the “low” scenario (based on assumptions estimated from Census income data). The “high” scenario assumptions generally result in higher estimated impacts of the fiscal options on Alaska household spending and correspondingly higher multiplier economic impacts than the “low” scenario options.

The preceding sections of this appendix discussed the estimated impacts for “high” scenario. This section discusses the estimated impacts for the “low” scenario.

All of the direct economic impacts are the same for the “low” scenario as for the “high” scenarios. The differences are in the multiplier economic impacts. These differ because we assume that changes in household income have smaller impacts on household spending.

The top two rows of Table D-13 show the estimated expenditure reductions per thousand dollars raised for the high and low scenarios, as reported in Figure II-7. We use the ratio of the low scenario expenditure reductions to the high scenario expenditure reductions as “multiplier adjustment factors” for each of the tax and dividend cut fiscal options. For the spending cut options, we assume a multiplier adjustment factor equal to the average of the multiplier adjustment factors for the tax and dividend cut options (64.8%).

Table II-13

Calculation of Multiplier Adjustment Factors for Low Scenario Economic Impact Estimates

Fiscal option	Income tax: progressive	Income tax: flat rate	Sales tax: more exclusions	Sales tax: fewer exclusions	Property tax	Dividend cut
Assumed expenditure reductions per thousand dollars raised						
High scenario (based on IMPLAN data)	748	791	841	866	866	931
Low scenario (based on Census data)	512	507	511	526	567	646
Multiplier adjustment factor for low scenario economic impact estimates (= ratio of low scenario expenditure reductions to high scenario expenditure reductions)	68.4%	64.1%	60.8%	60.7%	65.5%	69.4%

We multiply the estimated economic impacts from Table II-12 by the multiplier adjustment factors from Table II-13 to calculate the low scenario economic impact estimates shown below in Table II-14.

Table II-14

**Estimated Short-Run Economic Impacts of Selected Options for Reducing the Deficit by \$100 Million:
Low Scenario**

Option	Income Impacts (millions of \$ of income)				Employment Impacts (FTE jobs in Alaska)		
	Direct earned	Direct other	Multiplier	Total	Direct	Multiplier	Total
Spending cut: workers	95.0		27.7	122.8	962	464	1425
Spending cut: broad-based	67.5		30.9	98.4	504	489	993
Spending cut: capital	41.7		14.4	56.1	506	275	781
Spending cut: pay	100.0		28.1	128.1	0	471	471
Income tax: progressive		92.6	31.0	123.6	0	538	538
Income tax: flat rate		92.6	29.3	121.9	0	511	511
Sales tax: more exclusions		88.5	26.8	115.3	0	471	471
Sales tax: fewer exclusions		90.0	27.3	117.3	0	483	483
Property tax		97.2	31.7	128.9	0	559	559
Dividend cut		99.0	34.6	133.7	0	619	619
Saving less				0.0			0

Changes in Estimated Economic Impacts from Earlier Estimates

In response to requests by the press and legislators, we prepared several sets of estimates of short-run economic impacts of selected fiscal options prior to finishing this draft report. Some of these earlier estimates differ from the estimates provided in this appendix and elsewhere in this report.

The estimates in this report represent our best estimates of the short-run economic impacts of the fiscal options which we analyzed, and replace any earlier estimates. Below we provide a brief description of the reasons for differences between the estimates in this report and earlier estimates.

All of our earlier estimates were “high scenario” estimates based on the IMPLAN spending assumptions.

We prepared the estimates shown below for an article in the January 2016 edition of *Alaska Business Monthly* (<http://www.akbizmag.com/Alaska-Business-Monthly/January-2016/Alaskas-Economy/>). We noted that these were “preliminary calculations for an ongoing ISER study of economic impacts of state fiscal options.”

How the \$100 million is cut	Employment Impacts (full-time equivalent jobs in Alaska)			Income Impacts (millions of \$ of income earned in Alaska)			Impacts as % of Alaska total		Deficit reduction per lost job
	Direct	Multiplier	Total	Direct	Multiplier	Total	Employment	income	
Spending cut: state workers	962	715	1677	95.0	42.8	137.8	0.50%	0.81%	\$59,622
Spending cut: across the board	505	755	1260	67.5	47.7	115.2	0.38%	0.67%	\$79,346
Spending cut: capital projects	506	425	931	41.7	22.3	63.9	0.28%	0.37%	\$107,449
Income tax	0	971	971	0.0	53.9	53.9	0.29%	0.32%	\$103,033
Permanent Fund Dividend reallocation	0	727	727	0.0	43.3	43.3	0.22%	0.25%	\$137,476
Spend other Permanent Fund earnings	0	0	0	0.0	0.0	0.0	0.00%	0.00%	NA

Source: Preliminary calculations for an ongoing ISER study of economic impacts of state fiscal options, using IMPLAN economic impact model, December 2015. Note that economic impacts of fiscal options may vary substantially depending on what kinds of spending are cut (payments to workers of different income levels, utilities, contracts, capital spending, etc.) or how taxes are structured.

While the spending cut estimates for the *Alaska Business Monthly* (ABM) article are the same as those in Table D-12, the estimated impacts are different for an “income tax” and for a “Permanent Fund Dividend reallocation” than for the income tax and dividend cuts we estimated in Table 12, and they also differ in their relative magnitudes. There are a number of reasons for these differences, all of which derive from the fact that the ABM estimates were based on simpler assumptions made when we were at a much earlier stage of our analysis.

For these earlier ABM estimates we modeled the impacts of dividend cuts as reductions in average employee compensation, and we modeled impacts of an income tax as specific reductions by income group. We did not adjust for household size in order to derive impacts of dividend cuts by income group. This choice meant that the estimated multiplier impacts of dividend cuts were smaller because our estimates did not account for the fact that lower income households spend more of their income than their higher income counterparts. We did not adjust for residency, so we implicitly assumed that both the income tax and the dividend cuts would equally affect the Alaska economy. We also did not adjust for the decline in federal tax liability the households experience as a result of not receiving the dividend and/or paying a state income tax.

In contrast, for this report, we treat both income taxes and PFD reductions as income reductions, which means that the same taxes and savings are removed by income group. We adjust for household size by income group in order to generate the appropriate PFD reductions. We adjust for residency status in order to allow for the fact that the income generated by a dividend cut is almost all coming from Alaskans while the income generated by an income tax has a much larger non-resident component. This is probably the most important reason why the relative impacts which we estimate for an income tax are smaller in this report than for a dividend cut. We also adjust for the decline in the federal tax liability resulting from a state income tax or PFD reductions. All of these adjustments together make the analysis for this report a much better estimate of the implications of the two options.

In short, the estimates for the ABM article were based on the preliminary analysis we had done as of that time and represented our best estimates as of that time. Our estimates for this report are based on much more detailed (and time-consuming) analysis and thinking which we have done since that time.

Gunnar Knapp also provided presentations entitled “Economic Impacts of Alaska Fiscal Options: Overview of Draft Conclusions” to the House Finance Committee on February 25, 2016 and to the House Labor and Commerce Committee on February 29 and March 2, 2016. After we had given these presentations, we discovered a small error in our calculations for the revenue impacts of the tax and dividend cut options. Correcting for this error resulted in small changes to the short-run economic impacts shown in this report compared with those shown in the presentations, but these did not change the absolute or relative estimates in any significant way.

Limitations of Short-Run Economic Impacts Analysis

It is important to be aware of several significant limitations to our short-run economic impact estimates, which reflect inherent limitations of economic impact analysis using input-output (IO) models such as the IMPLAN model.

First, IO models are demand oriented and assume that the supply of outputs is unlimited. This means that an increase in demand is always met by an increase in supply. Put differently, there are no supply constraints. In general, this limitation would be more important if we were estimating the impacts of increasing spending or dividends or reducing taxes than it is for estimating the impacts of reducing spending or dividends and increasing taxes.

Second, IO models assume that commodity and factor prices are fixed regardless of any change in demand. Due to these assumptions, IO models tend to overestimate the effects of policy changes (Miller and Blair, 1985). For example, we did not take into account the fact that job loss impacts might potentially affect labor markets, causing wage rates to fall, which might in turn cause some employers to hire more labor, thus partially offsetting the original impact of the job losses.

Third, IO models assume zero substitution elasticities in production and consumption. The lack of substitution coupled with the fixed prices means that results from IO models are best suited for understanding the short-run implications of shocks.

The options we model are approximations of how the different options would translate into statewide economic impacts. The impact of government job and earning cuts would depend on the salaries of those affected and the department in which they are employed. On the earnings side, benefit cuts would reduce overall compensation but do not affect near term consumption of the workers.

Our sales tax estimates assume that households view the taxes as a reduction in income and therefore cut back on all expenditure components in proportion to their personal expenditure mix, without changing the mix of goods and services which they purchase. This household response is a reasonable one but implicitly assumes that the tax is passed onto the consumer.