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Web Notes

Alaska's Oil Production Tax: Comparing the Old and the New

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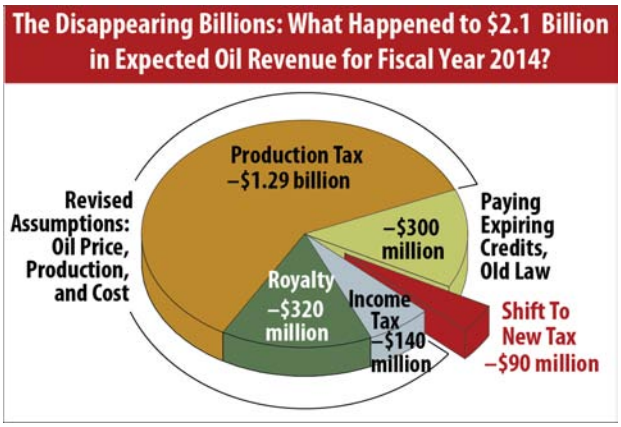
Last year the Alaska Legislature made a controversial change in the oil production tax, the state's largest source of oil revenue. The old tax, known as ACES (Alaska's Clear and Equitable Share), was replaced with MAPA (More Alaska Production Act, or SB21). How much money the production tax brings in is a big issue: oil revenues pay for most state government services, and the industry accounts for roughly half of all Alaska jobs.

Supporters say the new tax will stimulate North Slope oil investment, leading to more oil production—and so to higher oil revenues and new jobs. Critics say the oil industry doesn't base investment decisions on tax structure, and that the revised tax is a give-away to the industry. They cite as evidence the $2.1 billion drop in the Alaska Department of Revenue's forecast of expected 2014 oil revenues after the new law was passed.

Alaskans face a choice between the old and the new tax structures this August, when a referendum on the primary election ballot will ask them whether to keep or repeal the new structure. This paper is intended to help Alaskans understand the two systems, which have the same tax base but differ in their tax rates, credits, and treatment of certain new production.



• *About 4% of the $2.1 billion drop in the fall oil revenue forecast for 2014 is due to the new tax.* Most of the decline can be traced to lower price and production assumptions—as well as higher cost assumptions—in the forecast, and the effects of those changes on the tax rate. The rest of the decline is a one-time drop, with oil producers claiming credits expiring with the old tax.

• *Future revenues are very sensitive to oil prices and costs of production and are difficult to forecast. If current trends continue—if costs continue to rise faster than oil prices—the new tax could produce more revenue. But if conditions revert to those of past years, when production costs were lower, relative to oil prices, the old tax could produce more revenue.* Among the factors contributing to rising production costs in recent years have been inflation in the price of inputs, maintenance of aging facilities, and development of marginal fields.

• *The tax change, combined with a modest increase in new production, would produce higher revenues under a reasonable range of assumptions about oil prices and production costs.* New investment would drive up tax deductible costs in the short run—reducing production taxes—but that loss would be more than offset in later years by additional production tax and royalty revenues from new production, even at a lower average tax rate.

• *Investments that draw new outside money into the oil patch could create long-lasting jobs and increase consumer purchasing power.* For example, $4 billion in new spending in the oil patch could add an average of 5,000 public and private sector jobs per year over 20 years, with more than $300 million of additional wages and salaries annually.

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Northrim Bank

HOW THE PRODUCTION TAX WORKS

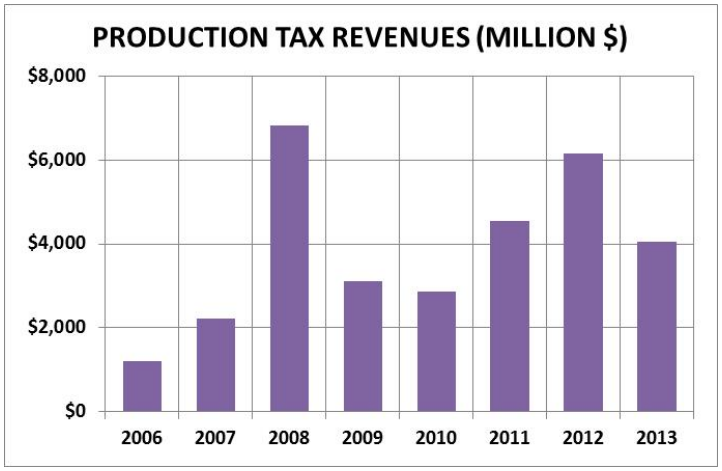
Since 2007 the petroleum production tax has been a net profits tax. The tax base for any production company, formally called the production tax value or PTV, is the market value (market price multiplied by production) minus the cost of transportation from the wellhead to market, royalties, and lease costs (operating and capital expenses required to produce the oil).

TAX BASE = NET PROFITS = PRODUCTION TAX VALUE (PTV) =
(Market Price * Production) – Transportation Costs – Royalties – Lease Costs

The tax liability is determined by multiplying the tax rate by the production tax value (PTV) and then subtracting any tax credits that the company is eligible to receive (subject to some limits).

TAX LIABILITY = nominal tax rate * PRODUCTION TAX VALUE - CREDITS

Because the tax liability with a net profits tax depends not only on market price, production, and the nominal tax rate, but also on lease and transportation costs and credits, estimating its amount is not straightforward. Furthermore, the nominal tax rate and the value of credits may vary with changes in prices, costs and production. Thus it is not surprising that production tax revenues have fluctuated significantly in recent years and that forecasts have proven inaccurate.



Because of the deductibility of credits, the effective tax rate—the percent of production tax value actually paid as taxes—is typically less than the nominal rate.[i]

EFFECTIVE TAX RATE = TAX LIABILITY / PRODUCTION TAX VALUE

Descriptions of the mechanics of the production tax are often done on a per barrel basis. For example the following table showing the steps in calculating the tax is derived from a Department of Revenue production tax estimate for FY 2013.

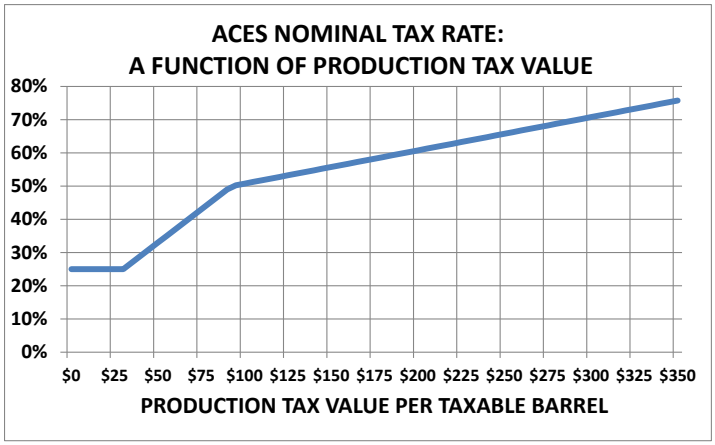
FY 2013 PRODUCTION TAX ESTIMATE		
1	MARKET PRICE	$ 107.57
2	MINUS: TRANSPORT COST	($ 9.76)
3	MINUS: ROYALTY SHARE OF VALUE PER BARREL AT WELLHEAD	($ 15.21)
4	MINUS: LEASE COST	($ 25.38)
5=1-2-3-4	EQUALS: PRODUCTION TAX VALUE (PTV) PER BARREL	$ 57.22
6	ACES TAX RATE	40.1%
7 = 5*6	NOMINAL TAX PER BARREL	$22.95
8	MINUS: CREDITS	($ 2.22)
9=7-8	EQUALS: EFFECTIVE TAX	$20.73
10=9/5	EFFECTIVE TAX RATE	36.2%
11	ANNUAL PRODUCTION (000)	194,034
12=9*11	**TAX LIABILITY (BILLION $)**	**$ 4.022**
Note: Lease cost is the average across total annual production. Annual production includes royalty barrels.		
Source: Derived from Alaska Department of Revenue, Revenue Sources Book, Fall 2013, table E-1a. Page 104.		

Both the new oil production tax, known as SB21 or MAPA (More Alaska Production Act), and the one it replaced last year—ACES (Alaska's Clear and Equitable Share)—have the same tax base of production tax value, and share similar other features, such as a special exploration credit for small producers. Their main differences are in the nominal tax rate and credits. In addition MAPA has some special features that apply only to three categories of new oil—oil produced from a new unit, from a new participating area in an existing unit, or from an extension of an existing accumulation. This oil is called Gross Value Reduction (GVR) oil.[ii]

Nominal Tax Rate[iii]

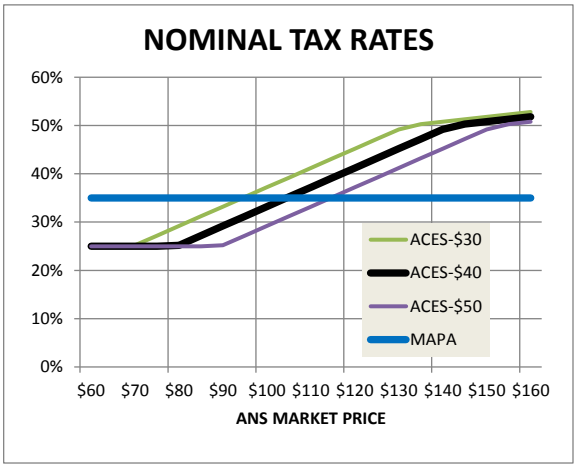
The MAPA nominal tax rate is constant at 35% of the production tax value. The ACES nominal tax rate is a variable function of the production tax value (PTV) *per barrel of taxable oil (production excluding royalty barrels)*. It has a floor of 25%. For every $1 increase in the production tax value per taxable barrel above $30, the nominal tax rate increases by .4%. When the production tax value per taxable barrel reaches $92.50, the increase in the nominal tax rate falls to .1% per $1. The nominal tax rate reaches a ceiling of 75% when the production tax value per taxable barrel reaches $342.50.

Based on this formula, the ACES nominal tax rate will range between 25% and 75%, depending on the production tax value. The tax rate is progressive since as the production tax value grows, the state captures a larger share is through the higher nominal tax rate.



The ACES nominal tax rate will change when either the price or the cost of production (or transportation) changes, because both determine the production tax value.

This figure compares the nominal MAPA and ACES tax rates at different market prices and three different levels of production cost per barrel ($30, $40, and $50). The MAPA tax rate is 35% at every combination of price and cost. The ACES tax rate can be higher or lower than MAPA and will be 35% at many different combinations of price and cost.



Because the ACES nominal rate is progressive, revenues (before credits) would generally be higher than MAPA at high prices, and lower at low prices, with the cross-over point dependent on costs. If the cost is high ($50) then the cross-over price is $115. If the cost is low ($30) then the cross-over price is only $95. And at certain combinations of price and cost, like $105 and $40, the nominal tax rate would be the same for either ACES or MAPA.

The ACES tax rate is calculated each month to take account of monthly variation in the price of oil. Because the rate is progressive, the tax liability based on a fluctuating monthly production

tax value will generally be greater than if it were calculated on the annual average production tax value per barrel.

Tax Credits

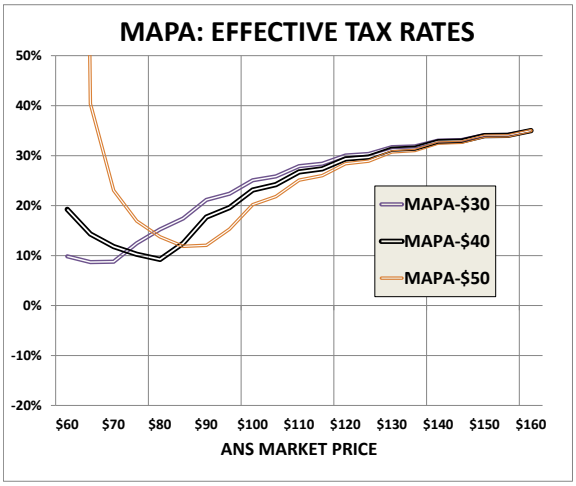
Credits can be used to offset some or all tax liability under both ACES and MAPA. This reduces the effective tax rate for both and also adds progressivity to both.

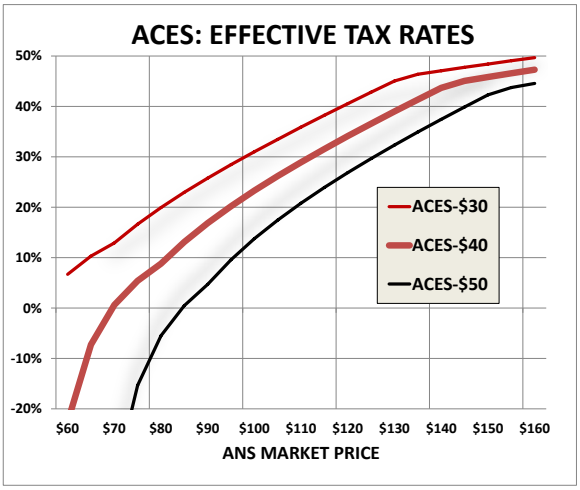
The most important MAPA tax credit is the production credit based on the wellhead price of a barrel of oil.[iv] The credit is on a sliding scale that ranges from $8 per barrel at a wellhead price below $80 to $0 at a value above $150. This introduces some limited progressivity into the effective tax rate. The credit can only be used to offset the current year tax liability.[v]

The most important ACES tax is the capital expenditure credit. The credit is 20% of allowable lease capital expenditures. The effect of this credit is to reduce the effective tax rate and to increase its progressivity. The credit can be applied against the minimum tax and if the credit exceeds the tax liability, a portion can be applied against future taxes owed, or sold to another company or to the state.[vi]

These figures compare the effective tax for MAPA and ACES for different market prices and lease cost per barrel. The effective tax rates for both are below the nominal rates, but approach the nominal rates as the production tax value increases (when price is higher and/or cost is lower).

The greater the slope of the lines, the more sensitive is the effective tax rate to market price. The more widely disbursed the lines, the more sensitive is the effective tax rate to the cost of production. The MAPA effective rate is much less sensitive to either price or cost than is ACES.

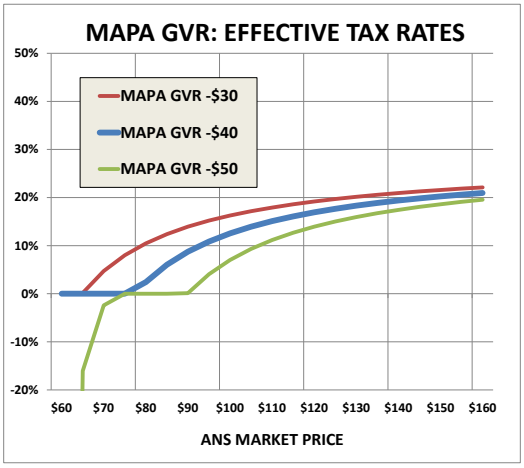




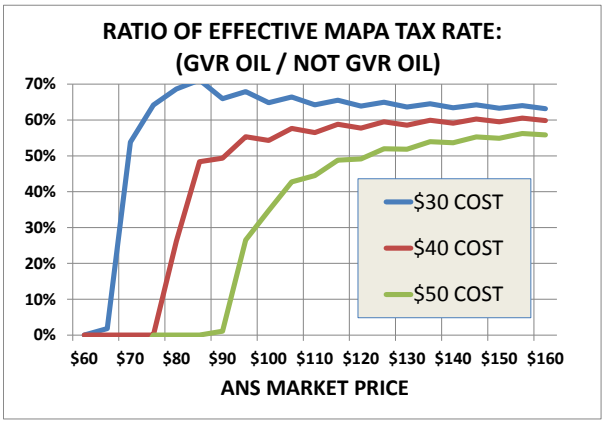
MAPA Special Treatment of Some New Production (Gross Value Reduction, or GVR Oil)

With ACES the same tax rate and credits apply to all production.

MAPA treats oil produced in three categories—a new unit, a new participating area in an existing unit, and an extension of an existing accumulation--differently in two important respects. First, 20% of the wellhead value of this production[vii] is excluded from the tax base (production tax value). Second, a flat $5 per barrel tax credit replaces the sliding scale production credit. Together these features introduce some progressivity into the effective tax rate and reduce its level below that of MAPA oil not eligible for this Gross Value Reduction (GVR).



At high oil prices the effective tax rate for MAPA GVR eligible oil is about 60% that of other MAPA oil. At lower prices the ratio falls.



MAIN FEATURES OF PRODUCTION TAXES			
	MAPA	**MAPA – OIL ELIGIBLE FOR GROSS VALUE REDUCTION (GVR)**	**ACES**
TAX BASE	Production tax value (PTV)	Production tax value minus 20% of wellhead value *	Production tax value (PTV)
NOMINAL TAX RATE	35% of PTV	35% of adjusted PTV	25% of PTV at low PTV per barrel Between $30 and $92.50 rate increases .4% for each $1 increase of PTV per barrel Between $92.50 and $342.50, rate increases .1% for each $1 Above $342.50 rate constant at 75%
NOMINAL RATE CALCULATION	NA	NA	Monthly
NOMINAL TAX FLOOR	4% of wellhead value*	None	4% of wellhead value*
CREDITS AGAINST TAX LIABILITY	$8 per barrel of production when wellhead price below $80 Falling to $0 above $150 wellhead No carry-forward or transfer Cannot offset minimum tax	Flat $5 per barrel credit No carry-forward or transfer Can offset minimum tax	20% of lease capital expenses Carry-forward and sales allowed Can offset minimum tax
OPERATING LOSS CARRY FORWARD	35% of net operating loss can be used to offset future liability Carry-forward and sales allowed	Partial carry forward allowed	25% of net operating loss can be used to offset future liability Carry-forward and sales allowed
Note: Wellhead value is also referred to as the Gross Value at the Point of Production (GVPP)			
Source: Alaska Department of Revenue, Senate Finance Committee presentation, March 12, 2013. Available at the MAPA Document Library at http://dor.alaska.gov/MAPActDocuments.aspx			

THE DISAPPEARING $2.1 BILLION "GIVEAWAY"

When the new oil production tax known as SB21 or MAPA (More Alaska Production Act) was passed by the legislature last year replacing ACES (Alaska's Clear and Equitable Share), the Alaska Department of Revenue forecast the change would cost Alaska $700 million in lost revenue in its first year (FY 2014) and as much as $4 billion over the next 5 years, assuming no incremental production stimulated by the new tax[viii]. Opponents of the tax viewed this as evidence of a massive "give away" to the oil producers. This fear seemed validated when a few months later the Alaska Department of Revenue issued their annual 10 year oil revenue report (Revenue Sources Book, Fall 2013) showing a $2.142 billion drop in FY 2014 revenue compared to the previous year forecast before MAPA was passed.

However only about $88 million (4%) of the drop in forecasted FY 2014 revenue was due to replacing ACES with MAPA. $463 million was due to lower forecasts of royalty and income tax revenue. These reductions, which obviously had nothing to do with the change in the production tax, resulted from downward revisions in assumptions about price and production and an upward revision in assumptions about cost. Under these same new assumptions revenues from ACES (with no change in the tax law) would have fallen by $1.290 billion. However, the reported drop in ACES was $1.690 because of the inclusion of a one-time $301 million payoff by the state to cash out expiring ACES credits. After accounting for all these changes, only about $88 million of the drop is attributable to the shift from ACES to MAPA.

PROJECTIONS OF FY 2014 PETROLEUM REVENUES (Million $): BEFORE AND AFTER SWITCH FROM ACES TO MAPA

	DATE OF PROJECTION		CHANGE 2012-2013	
	FALL 2012 (BEFORE)	FALL 2013 (AFTER)	AMOUNT	%
TOTAL	**$ 7,257**	**$ 5,116**	**- $ 2,142**	**-30%**
ROYALTY	**$ 2,772**	$ 2,453	- $ 320	-12%
CORPORATE INCOME TAX	$ 607	$ 464	- $ 143	-24%
PROPERTY TAX	$ 99	$ 100	+ $ 1	+1%
PRODUCTION TAX	$ 3,779	$ 2,100	- $ 1,679	-44%
Revised (Lower) Assumptions			-$ 1,290	**-32%**
ACES Credit Cash-Out			-$ 301	
SHIFT FROM ACES to MAPA			**-$ 88**	

Source: Alaska Department of Revenue, Revenue Sources Book.

The revised assumptions between the fall 2012 and fall 2013 reports are shown in the next table. Market price fell 4% and production fell 6%. The cost per barrel, both for transportation and for production (lease cost), increased about 14%. [ix]

ASSUMPTIONS USED TO FORECAST FY 2014 PETROLEUM REVENUE (Million $)				
	DATE OF PROJECTION		CHANGE 2012-2013	
	FALL 2012 (BEFORE)	FALL 2013 (AFTER)	CHANGE	% CHANGE
MARKET PRICE PER BARREL	$109.61	$105.68	- $ 3.93	-4%
TRANSPORT COST PER BARREL	$ 8.81	$10.11	$ 1.30	15%
LEASE COST PER BARREL	$31.12	$35.38	$ 4.26	14%
PRODUCTION PER DAY (000)	538	508	- 30	-6%
Source: Alaska Department of Revenue, Revenue Sources Book				

The changes in market price and production caused the projected market value of production to fall $1.937 billion (9%) from $21.540 billion to $19.603 billion.

ANS OIL MARKET VALUE FY 2014 PETROLEUM REVENUE PROJECTIONS				
	DATE OF PROJECTION		CHANGE 2012-2013	
	FALL 2012 (BEFORE)	FALL 2013 (AFTER)	CHANGE	% CHANGE
MARKET PRICE	$ 109.61	$ 105.68	- $ 3.93	-4%
BARRELS PER DAY (000)	538	508	- 30	-6%
TOTAL MARKET VALUE (BILLION $)	**$ 21.540**	**$ 19.603**	**- $ 1.937**	**-9%**
Source: Alaska Department of Revenue, Revenue Sources Book and author calculation				

When the lower market value was combined with the assumptions of higher cost, the production tax value—fell by $2.251 billion (20%) from $11.040 billion to $8.788 billion.

ANS OIL PRODUCTION TAX VALUE (PTV) FY 2014 PETROLEUM REVENUE PROJECTIONS				
	DATE OF PROJECTION		CHANGE 2012-2013	
	FALL 2012 (BEFORE)	FALL 2013 (AFTER)	CHANGE	% CHANGE
MARKET PRICE	$ 109.61	$ 105.68	- $ 3.93	-4%
MINUS: TRANSPORT COST PER BARREL	$ 8.81	$ 10.11	$ 1.30	15%
MINUS: ROYALTY VALUE PER BARREL AT WELLHEAD	$ 13.51	$ 12.81	- $ .70	-5%
MINUS: LEASE COST PER BARREL	$ 31.12	$ 35.38	$ 4.27	14%
EQUALS: PRODUCTION TAX VALUE PER BARREL	$ 56. 18	$ 47.38	- $ 8.80	-16%
BARRELS PER DAY (000)	538	508	- 30	-6%
PRODUCTION TAX VALUE (BILLION $)	**$ 11.040**	**$ 8.788**	**-$ 2.251**	**-20%**

Source: Alaska Department of Revenue, Revenue Sources Book and author calculation.

Note: The ACES tax rate is based on the production tax value per TAXABLE barrel. This is equal to the production tax value per barrel / (1-royalty rate). This fell from $64.87 in Fall 2012 to $54.71 in Fall 2013.

If this FY 2014 forecasted production tax value is plugged into the ACES and the MAPA tax formulas, the estimated full year tax for FY 2014 would be $2.245 billion under ACES and $2.068 under MAPA. But because ACES was in effect for the first half of FY 2014 before MAPA took effect on January 1, 2014, the estimated revenues with the tax change would actually be the average of the ACES and MAPA full year calculated revenues--$2.157 billion. The calculated difference between ACES and the first year of MAPA would then be $88 million.

FY 2014 PRODUCTION TAXES: ACES, MAPA & AVERAGE (BILLION $)		
	ACES (July – Dec)	MAPA (Jan-June)
PRODUCTION TAX VALUE*	$ 8.788	$8.666
NOMINAL TAX RATE	34.9%	35%
NOMINAL TAX	$ 3.066	$3.033
CREDITS	($ .820)	($.965)
TAX LIABILITY--FULL YEAR	$ 2.245	$2.068
TAX LIABILITY--6 MONTHS	$ 1.123	$1.034
TAX LIABILITY--AVERAGE OF ACES AND MAPA	$ 2.157	
ACES FULL YEAR TAX LIABILITY	$ 2.245	
ACES AND MAPA AVERAGE	-$ 2.157	
DIFFERENCE DUE TO SHIFT TO MAPA	**= $ .088**	
* MAPA production tax value is smaller because a small amount of production is eligible for the Gross Value Reduction (GVR) for new oil.		

Production tax value fell 20% between the forecasts because of the different assumptions, but the rest of the 32% decline in the production tax forecast was due to two reasons associated with the ACES tax structure. First, because the ACES tax rate varies with the production tax value per barrel, when the production tax value fell, the tax rate declined from 38.9% to 34.9%. Thus it was almost identical to the 35% MAPA tax rate. Second, when the capital cost per barrel increased, the ACES capital credits, which can be used to reduce tax liability, increased, further reducing the ACES tax revenues. This figure compares the importance of these different factors in explaining the drop in the production tax forecast between fall 2012 and fall 2013

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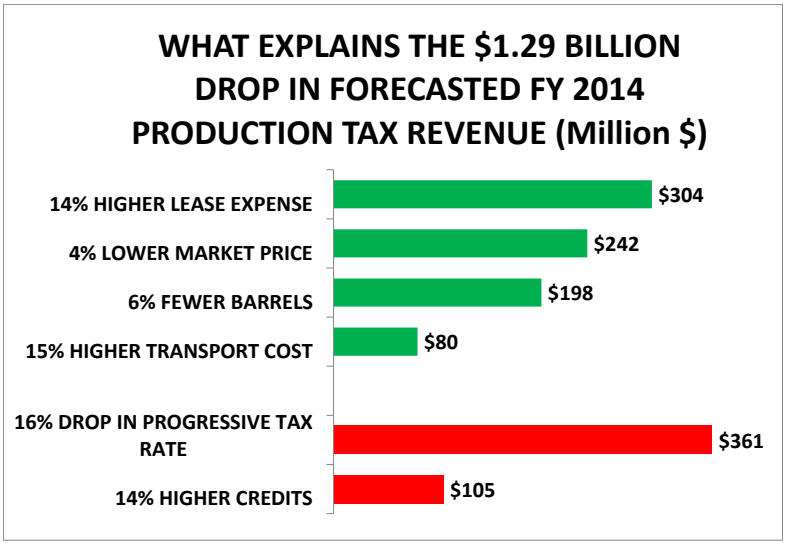


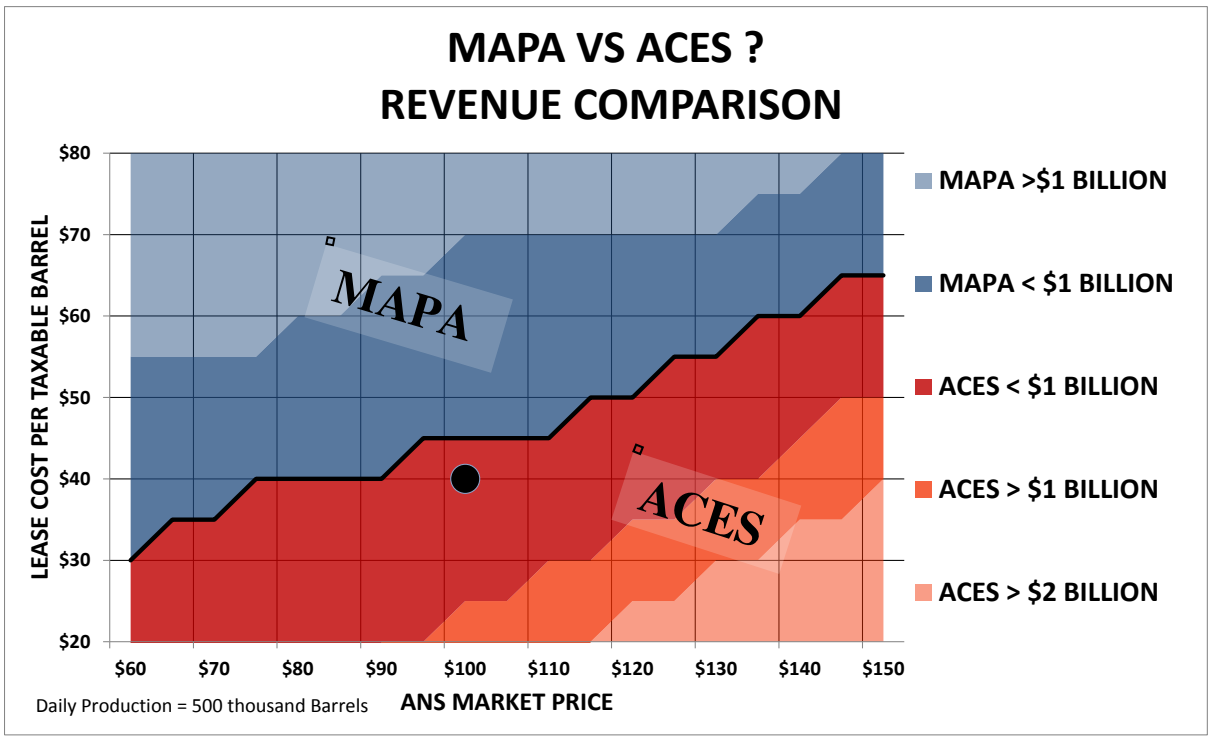
LOOKING BEYOND 2014: STATIC COMPARISON OF REVENUES FROM MAPA WITH ACES

MAPA and ACES are both calculated on the same tax base, known as production tax value (PTV). This is the value of oil at the wellhead after deduction of production costs (lease costs). Both taxes generate higher revenue when the production tax value increases and lower revenue when the production value falls.

The taxes differ in three important respects—the nominal tax rate, the credits allowed against the nominal tax to determine the net tax liability, and the tax treatment of certain new production (production eligible for the Gross Value Reduction, or GVR) under MAPA. The result of these differences is that under some conditions of price, production, and cost, which are impossible to forecast accurately, MAPA would generate more revenue than ACES, and under other conditions ACES would generate more revenue than MAPA.

This figure summarizes the market conditions of price and lease cost under which MAPA or ACES would generate more revenue. Market price is on the x-axis and lease cost is on the y-axis. Here the lease cost is per taxable barrel, which means it is the total lease cost divided by the number of taxable barrels (total barrels minus royalty barrels). The solid black line represents those combinations of market price and lease cost per taxable barrel where revenues from MAPA and ACES would be about the same[x].

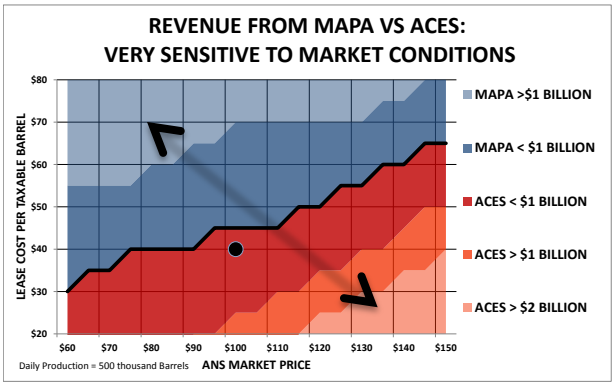
For market conditions in the blue area MAPA generates more revenue, while ACES does better in the red area. The further one moves away from the black line the greater the revenue advantage of one or the other tax becomes (indicated by the lighter shade). The ACES revenue advantage grows more rapidly as one moves away from the black line because the ACES effective tax rate is more progressive than MAPA.

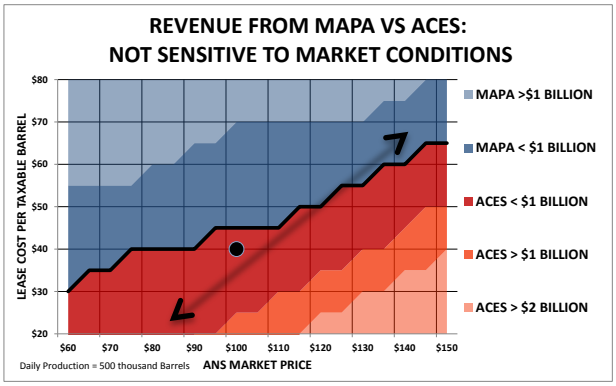


The approximate market conditions today (a market price of $100 and lease cost per barrel of $40)[xi] are represented by the black dot. Under these conditions ACES would generate $.41 per barrel more revenue than MAPA--$10.30 per barrel compared to $9.89. That amounts to $74 million a year on a base of 500 thousand barrels per day.

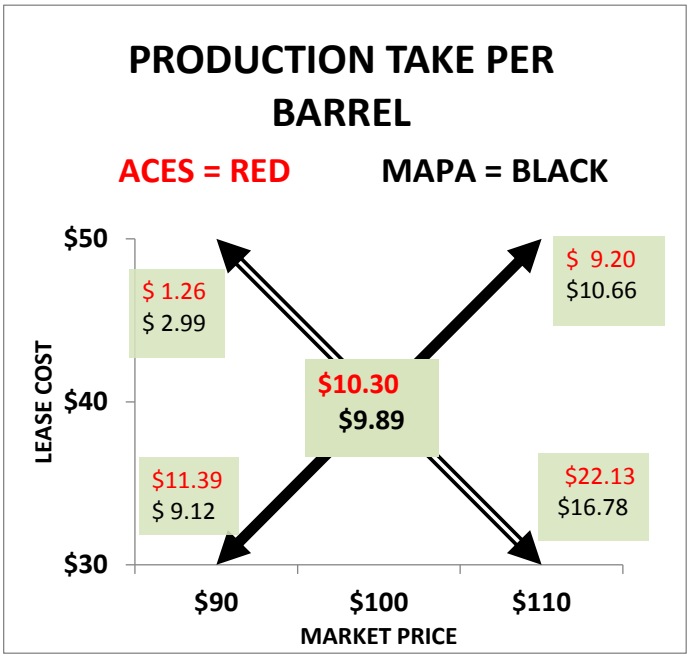
If price and cost move in opposite directions reflecting a substantive increase or decrease in the production tax value per barrel, movement is in the direction of the hollow arrow on the (figure below left. Higher cost and lower price favors MAPA; lower cost and higher price favors ACES.

If price and cost move together so that the production tax value does not change much, movement in the figure is in the direction of the solid arrow on the right below. Movement to the northeast favors MAPA and movement to the southwest favors ACES.

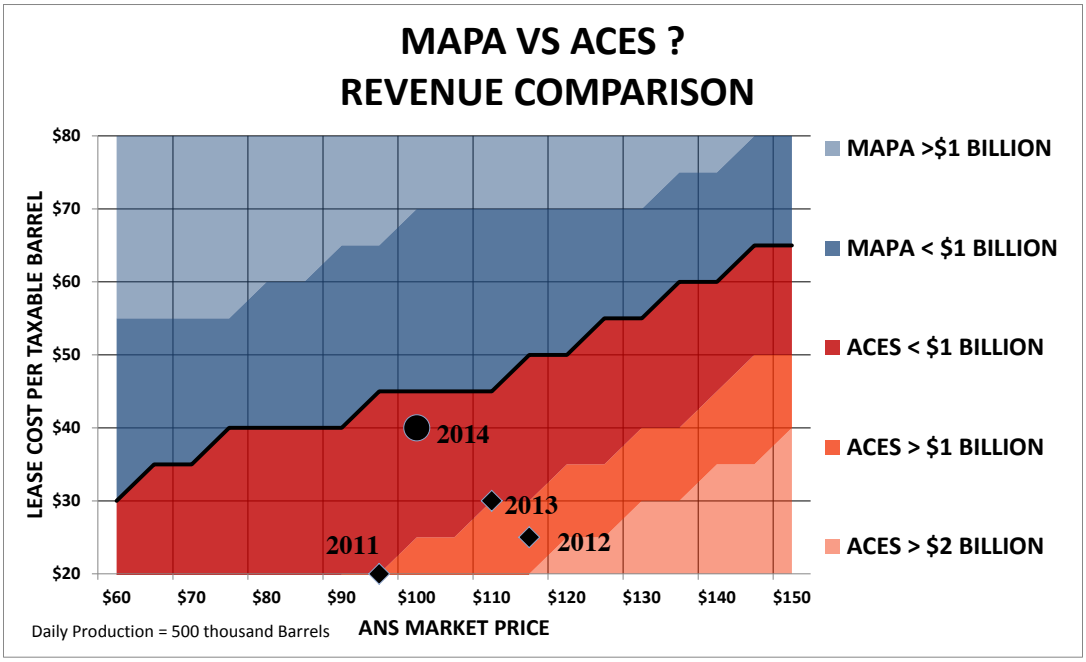




Market condition changes in these different directions have differential effects on the magnitude of tax revenue change because of the characteristics of the two taxes. The next figure compares revenue per barrel for current market conditions (the central box) with 4 possible cases where price and cost have each changed by $10. When price and cost are moving in opposite directions (hollow arrow) revenue is very sensitive to market conditions, particularly under ACES. When price and cost move in the same direction (solid arrow), the situation is more complex. ACES revenue per barrel falls when both market price and cost increase, but MAPA revenue per barrel increases. This is because as the market price increases the MAPA tax credit falls but the ACES tax credit increases as the cost goes up.



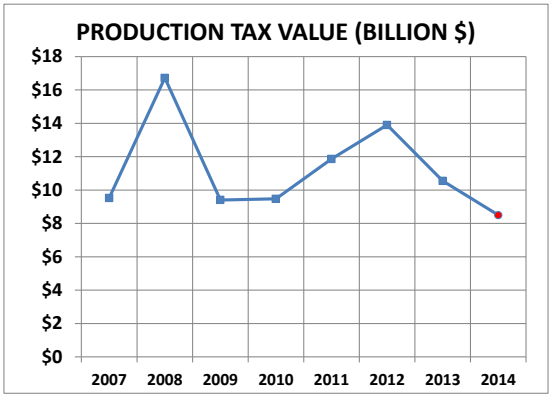
Market conditions in the previous thre years, shown as diamonds in the next figure, clearly resulted in higher revenues under ACES than would have been the case with MAPA. In those years the ACES revenue advantage was between $1 billion and $2 billion compared to MAPA.[xii]



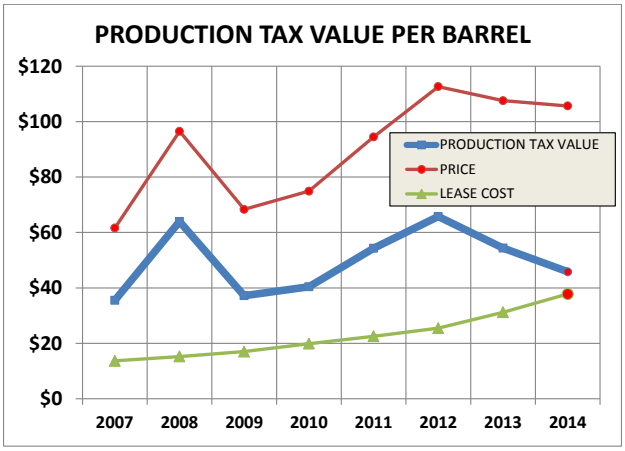
The ACES revenue advantage of these earlier years all but disappeared in FY 2014 because of the increase in the lease cost per taxable barrel and the drop in the oil price, which together resulted in a drop in the production tax value (PTV) per barrel.

Whether MAPA or ACES would produce more revenue in future years for a given level of production depends upon the future levels of price and cost since these together determine the production tax value (PTV).

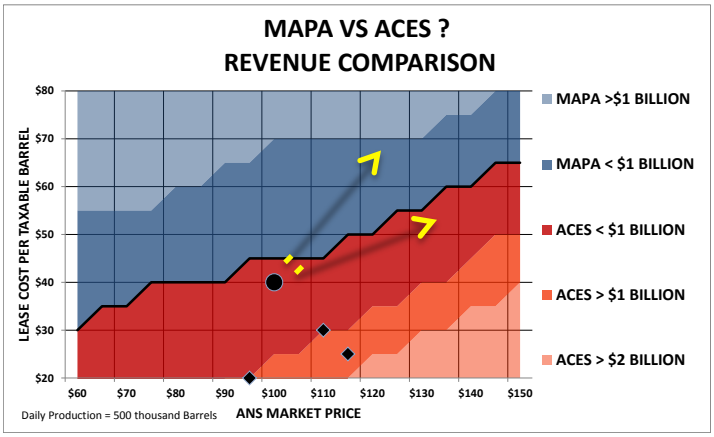
The production tax value (PTV) since the institution of ACES has ranged between $8 and $16 billion per year. The fact that production tax value has fluctuated by more than 20% each year except one underscores the challenge in trying to predict not only its future value but also future revenues from any production tax, MAPA or ACES, and what tax characteristics would consistently generate more revenue.



However, the historical movement of price and lease cost does provide some evidence that the production tax value (PTV) per barrel will be constant or lower in future years. This next figure shows that although the production tax value (PTV) per barrel is correlated to the price, it has been pulled down by the upward trending lease cost.



If this pattern continues, market conditions in future years are likely to be somewhere to the northeast of the current position. MAPA could easily generate more revenue for a given level of production than ACES.



DYNAMIC COMPARISON OF MAPA WITH ACES—PRODUCTION, REVENUE, AND JOBS

New Production

MAPA supporters believe the new tax will stimulate investment in oil and gas production that would not have occurred under ACES. And both Conoco Phillips and British Petroleum have recently announced plans for additional spending they say is due to the switch to MAPA.

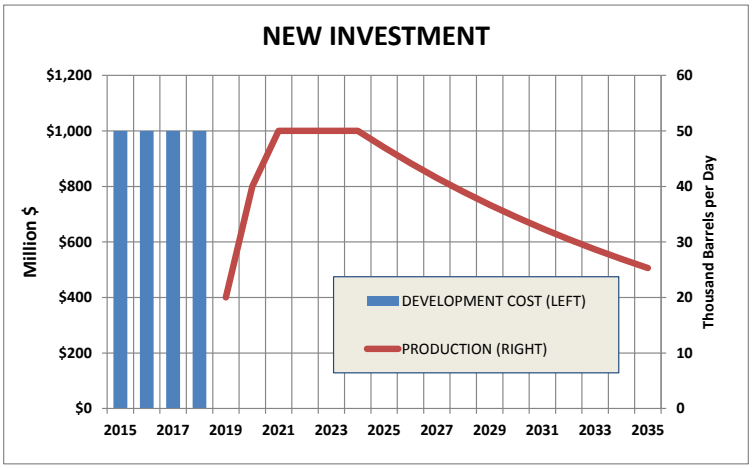
However, the stimulative effect of MAPA remains controversial. Many people believe ACES was successfully generating new investment, that investment and production are not sensitive to the tax structure, or that the producers are somehow "gaming the system" by attributing to MAPA investments they would have undertaken in any event, albeit perhaps at a later date.

Those who see no increase in investment from MAPA worry that it will simply mean a reduction in revenues. But the last section has shown that MAPA can produce higher revenues than ACES at equivalent production levels under plausible conditions—generally, if costs increase faster than prices.

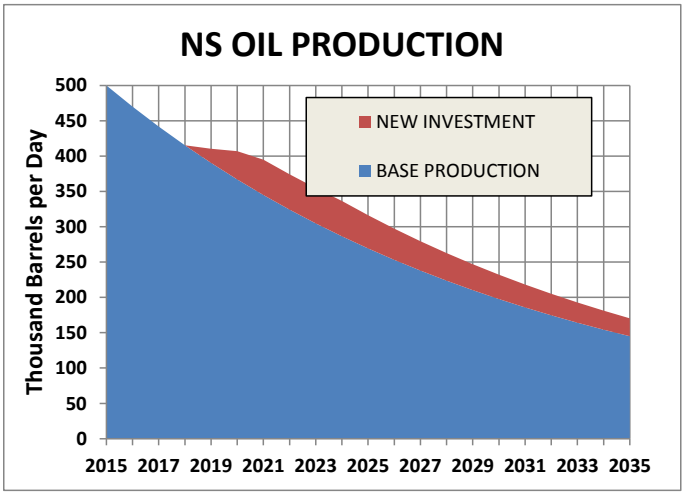
In this section we show that a new investment that increases production will almost always increase revenues and will significantly increase employment under either MAPA or ACES. The amount of revenue generated under the different tax regimes, and to a lesser extent the amount of employment, depends upon the underlying market conditions as well as the characteristics of the new investment.

To examine the effects of new investment, we assume a simple hypothetical case of $4 billion of new spending[xiii] spread evenly over a four-year period starting in 2015, followed by new production that peaks at 50 thousand barrels per day and subsequently declines at 6% per year. Cumulative production from startup in 2019 through 2035 would be 236 million barrels. This does not represent any particular project or projects, but rather an approximation of the characteristics of new projects.

HYPOTHETICAL NEW INVESTMENT		
Investment	$4 billion over 4 years	
Production	50 thousand	Peak barrels per day
	18.3 million	Peak barrels per year
	236 million	Cumulative barrels to 2035



The production associated with the new investment spending would marginally increase total North Slope production. If the rate of production decline averaged 6% in the absence of this new spending, with the additional production the decline would be reduced to 5.2% annually over the next 20 years.



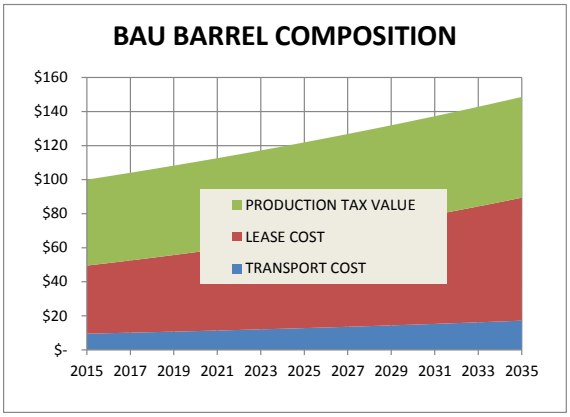
Business as Usual

We overlay this new investment onto a "business as usual" scenario of market price, lease cost, and production based on current market conditions and future changes consistent with historical trends—recognizing that these variables have displayed significant year-to-year fluctuations which are likely to continue. Consequently, the "smooth" trends reflected in the following analysis should not be taken as a forecast, but rather as representative of general conditions over the next two decades.

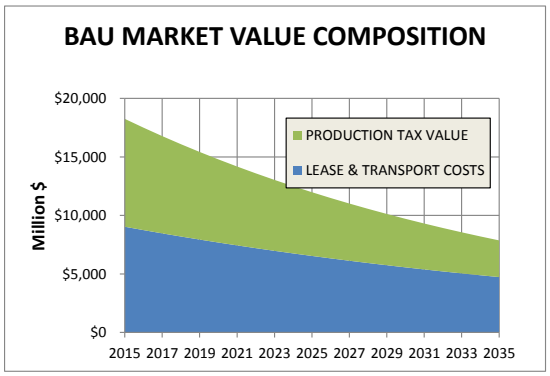
We assume production in the "business as usual" scenario declines 6% annually, price increases 2% annually, and costs—both for transportation and production—increase 3% annually.

BUSINESS AS USUAL ASSUMPTIONS		
	INITIAL VALUE (FY2015)	GROWTH RATE
PRODUCTION (000 PER DAY)	500	-6%
MARKET PRICE	$100	+2%
MINUS: TRANSPORTATION COST (PER BARREL)	$9.50	+3%
MINUS: LEASE COST (AVERAGED OVER TAXABLE BARRELS)	$40.00	+3%
EQUALS: PRODUCTION TAX VALUE (PER TAXABLE BARREL)	$50.50	.8%

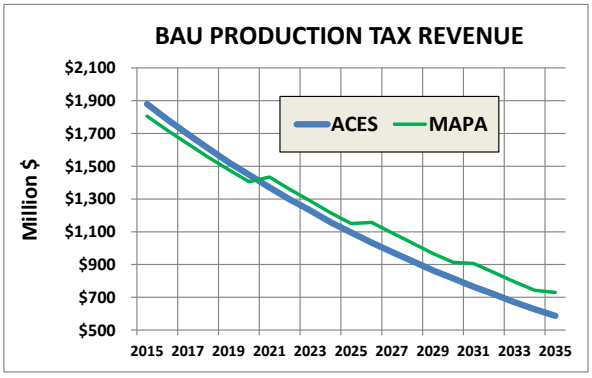
With price rising more slowly than costs, the production tax value (PTV) per taxable barrel increases at the rate of .8% annually and over time represents a smaller share of the market value of each barrel.[xiv]



And in the aggregate, the production tax value (PTV) falls as the decline in production outweighs the rise in production tax value per barrel[xv]. Total costs also fall, but more slowly.



The falling production tax value (PTV) results in declining production tax revenues over time. In this "business as usual" case, ACES revenues would initially be higher than MAPA, but after a few years revenues from MAPA would be higher because of the falling MAPA per barrel tax credit.

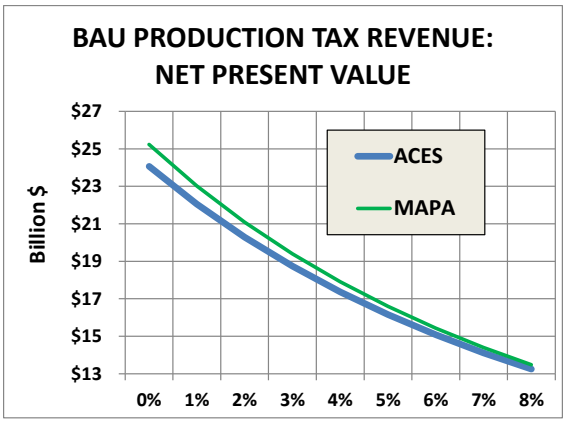


Net present value analysis allows us to compare these different revenue streams and decide which is worth more today.

A high discount rate of 8%—the target rate of return on the Alaska Permanent Fund—results in a low present value for these streams of future revenues. This reflects the fact that a small investment at 8% today could produce either future revenue stream.

On the other hand, a discount rate of 0%—no discounting—results in a much higher present value for these future revenue streams. This discount rate would be appropriate if we considered revenues received in future years more valuable than revenues received today; current revenues are abundant whereas future revenues are scarce.

In this "business as usual" case the net present value of revenues from MAPA and ACES over 20 years is almost the same at a high discount rate of 8%—about $13.5 billion. But as the discount rate falls, future revenues become relatively more valuable and the MAPA revenue stream becomes preferable. With no discounting at all (0%), the value of the MAPA revenue stream would exceed that of ACES by more than $1 billion.

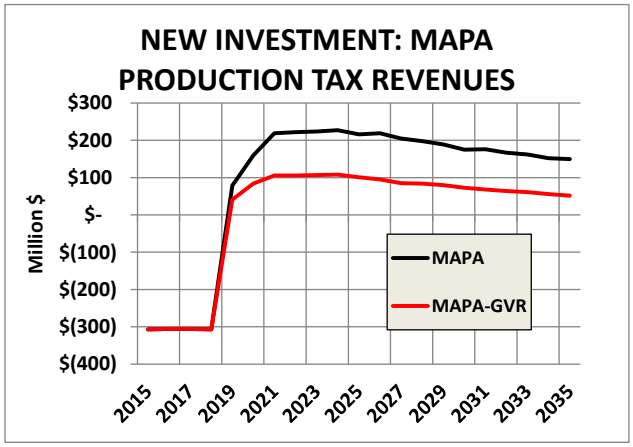


Revenue Impact of New Investment

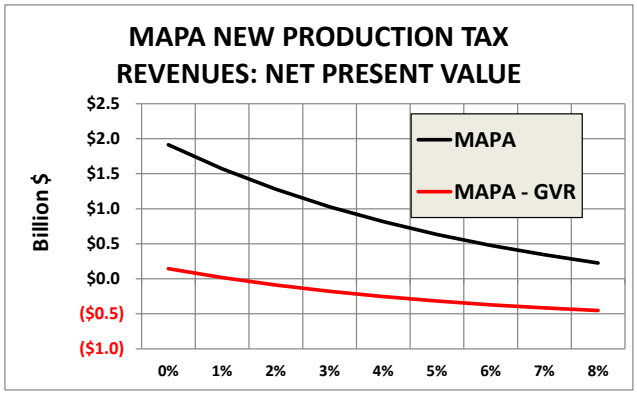
When the new investment is incorporated into the "business as usual" case, revenues fall in the first four years during the development phase of the project because the producers are spending more money but not producing any more oil. Then when new production begins and spending falls, revenues increase to a level above that of the "business as usual" case. The initial fall in revenues occurs because the production tax value (PTV) falls. When new production begins, the production tax value jumps up—both because lease costs falls below, and production grows above, the "business as usual" case.[xvi]

With MAPA the tax reduction during project development would be about 30% of the new investment. When production began the effective tax rate would be about 23%, unless the incremental production were eligible for the Gross Value Reduction (GVR), in which case the effective tax rate would be about 13%.

Over time the new production tax revenues would decline with declining production.



The value of this stream of new MAPA revenues depends upon the discount rate. Investment that increases oil from existing fields has a positive net present value at all discount rates. Investment that adds production from new fields (subject to the Gross Value Reduction) has a positive net present value at low discount rates, but has a negative value at higher rates.



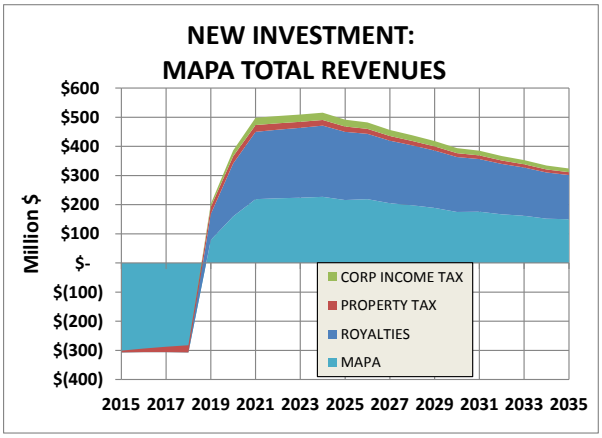
However, the total revenue impact of the new investment is not limited to the increase in the production tax. The state would also collect royalties on its ownership share of new production, as well as additional corporate income and property taxes. This table contains an estimate of these incremental revenues (which would be the same for MAPA or MAPA-GVR oil).

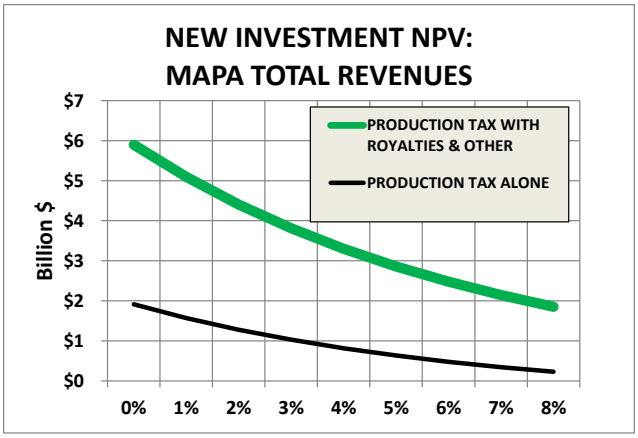
MAPA: TOTAL NEW REVENUES FROM HYPOTHETICAL NEW INVESTMENT (MILLION $)

	NEW PRODUCTION (thousand barrels per day)	WELLHEAD PRICE	MAPA PRODUCTION TAX REVENUE		ROYALTIES	PROPERTY TAX	CORPORATE INCOME TAX
			GVR	NOT GVR			
2015	0	$ 90.50	$ (307)	$ (307)	$ -	$ 6.20	$ -
2016	0	$ 92.22	$ (306)	$ (306)	$ -	$ 12.40	$ -
2017	0	$ 93.96	$ (306)	$ (306)	$ -	$ 18.60	$ -
2018	0	$ 95.74	$ (307)	$ (307)	$ -	$ 24.80	$ -

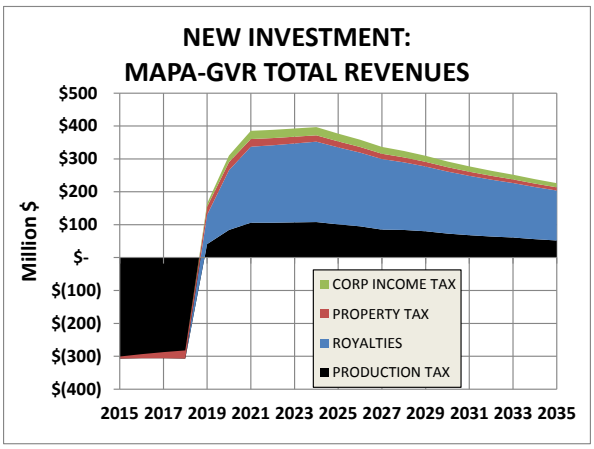
2019	20	$ 97.55	$ 41	$ 79	$ 89	$ 24.80	$ 10
2020	40	$ 99.39	$ 84	$ 160	$ 181	$ 24.80	$ 20
2021	50	$ 101.27	$ 106	$ 219	$ 231	$ 23.31	$ 25
2022	50	$ 103.18	$ 106	$ 222	$ 235	$ 21.91	$ 25
2023	50	$ 105.13	$ 107	$ 224	$ 240	$ 20.60	$ 25
2024	50	$ 107.11	$ 108	$ 227	$ 244	$ 19.36	$ 25
2025	47	$ 109.13	$ 101	$ 216	$ 234	$ 18.20	$ 24
2026	44	$ 111.19	$ 95	$ 219	$ 224	$ 17.11	$ 22
2027	42	$ 113.28	$ 85	$ 205	$ 215	$ 16.08	$ 21
2028	39	$ 115.41	$ 84	$ 198	$ 206	$ 15.12	$ 20
2029	37	$ 117.58	$ 80	$ 189	$ 197	$ 14.21	$ 18
2030	34	$ 119.79	$ 73	$ 175	$ 189	$ 13.36	$ 17
2031	32	$ 122.03	$ 68	$ 176	$ 181	$ 12.56	$ 16
2032	30	$ 124.32	$ 64	$ 167	$ 173	$ 11.80	$ 15
2033	29	$ 126.65	$ 61	$ 162	$ 166	$ 11.09	$ 14
2034	27	$ 129.02	$ 56	$ 152	$ 159	$ 10.43	$ 13
2035	25	$ 131.44	$ 52	$ 150	$ 152	$ 9.80	$ 13
Property tax base estimated to be 50% of capital investment which is 62% of development cost. Capital depreciates at 6% annually. Corporate income tax estimated to be $.50 per barrel.							

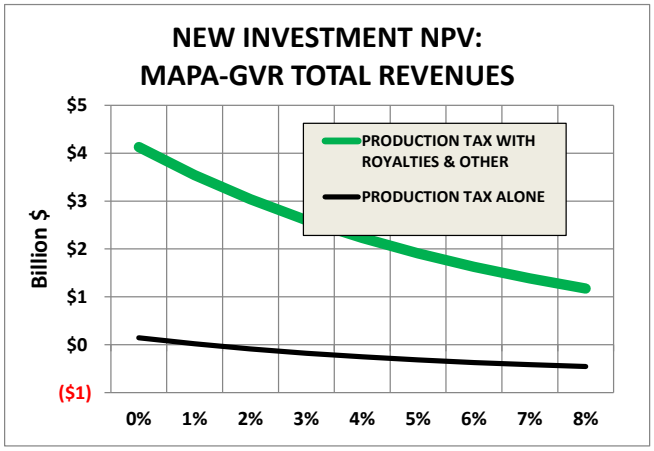
If the new production were from existing fields, the net present value including all new revenues from royalties and other taxes would range from $2 billion at an 8% discount rate up to $6 billion without discounting.





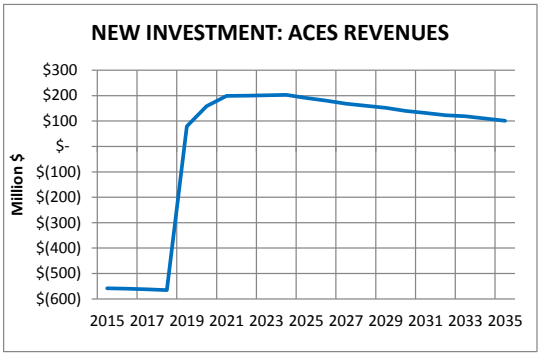
If the new production were from new fields subject to the gross value reduction (GVR), the net present value including all new revenues from royalties and other taxes would range from $1 billion at an 8% discount rate to $4 billion without discounting.



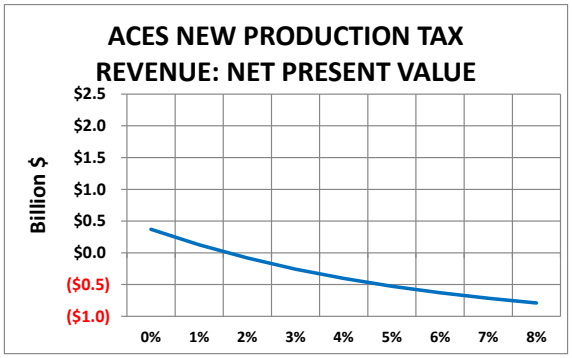


This new investment would also lead to an increase in revenue if ACES were the production tax. The drop in revenue during the development phase would be larger because the negative progressivity of the nominal tax rate would amplify the effect of the lower production tax value (PTV) per barrel and because the tax credits, based on capital spending, would increase. When production began the tax rate would initially be about the same as under MAPA (non GVR oil).

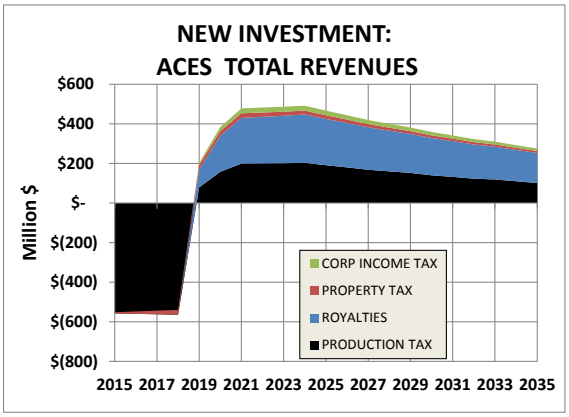
Incremental revenues per barrel would decline over time because of both declining production and a declining nominal tax rate.

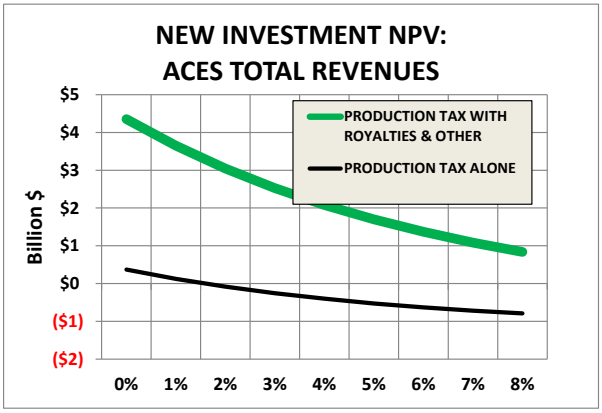


Due primarily to the higher ACES revenue loss during the investment phase of the project, cumulative production tax revenues from the new investment would be less with ACES than with MAPA. Consequently the net present value is negative at a high discount rate (8%). It is less than $400 million if undiscounted.

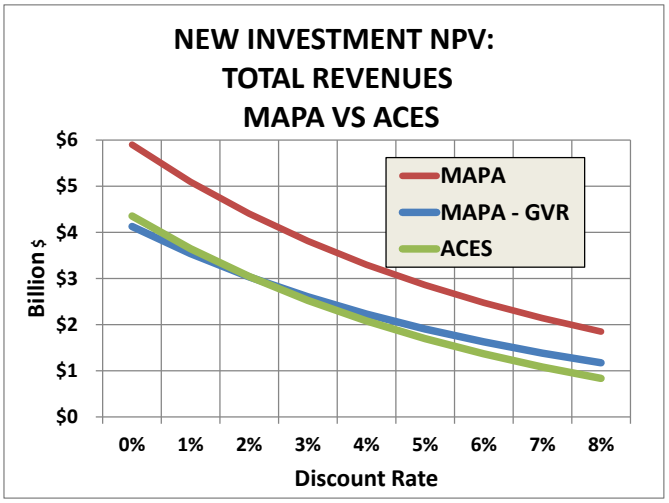


Since the additional revenues from royalties—as well as the corporate income and property taxes—depend on the amount of new production, they would be the same for ACES or MAPA. With the inclusion of these revenues, the net present value of the future revenue stream would be positive.





A comparison of the net present value of the future revenue streams from new production under the three tax regimes shows MAPA would generate the most revenue. ACES and MAPA with Gross Value Reduction (GVR) oil would generate about the same revenue.



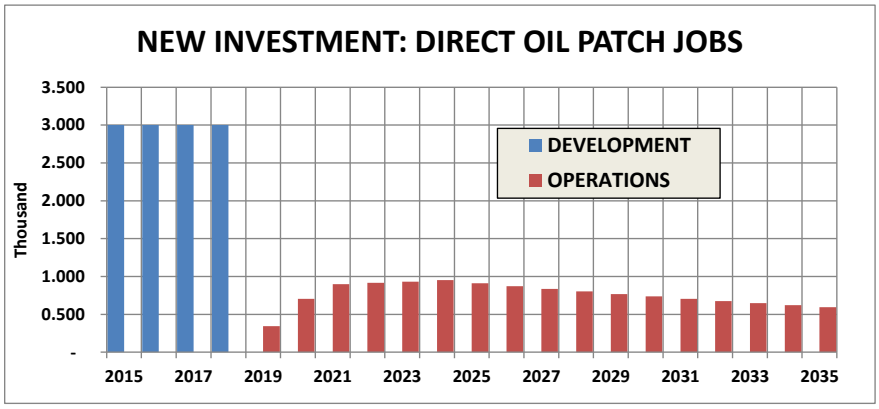
NEW INVESTMENT NET PRESENT VALUE: REVENUES COMPARED TO "BUSINESS AS USUAL" (BILLION $)			
DISCOUNT RATE	**MAPA-GVR**	**MAPA**	**ACES**
8%	$1.17	$1.85	$0.84
7%	$1.38	$2.14	$1.08
6%	$1.63	$2.48	$1.37
5%	$1.91	$2.86	$1.70
4%	$2.23	$3.30	$2.08

3%	$2.60	$3.81	$2.53
2%	$3.04	$4.40	$3.04
1%	$3.54	$5.09	$3.65
0%	$4.13	$5.90	$4.35

New Jobs and Payroll

New employment associated with this new investment would be about 5 thousand jobs on average over 20 years, or 100 thousand annual jobs in total. Although the exact number and timing of these new jobs is impossible to predict, the positive impact would be substantial because the investment would draw new money into the Alaska economy. Some of that money would go into the oil patch, and some would go into the state treasury.[xvii]

In the oil patch, the number of development jobs depends on the size of the investment. Direct job creation (petroleum industry and support industry workers in industries like facilities fabrication, transportation and warehousing) is small for each new dollar spent (bang per buck), because a large share of the spending goes for new capital equipment and supplies and also because the average payroll per worker is high. Direct employment during the production phase of the project will be a function of the level of production. The number of jobs per barrel of production will be modest due to the capital-intensive nature of production activity but will increase over time as field productivity declines.



The economic multiplier for these direct oil patch jobs will be high for two reasons. First, the high average payroll per worker means a lot of new purchasing power gets pumped into the economy from these workers. Second there will be numerous jobs created in industries providing goods and services in support of the oil patch jobs. The jobs created by the multiplier would be in virtually all private sectors of the economy.

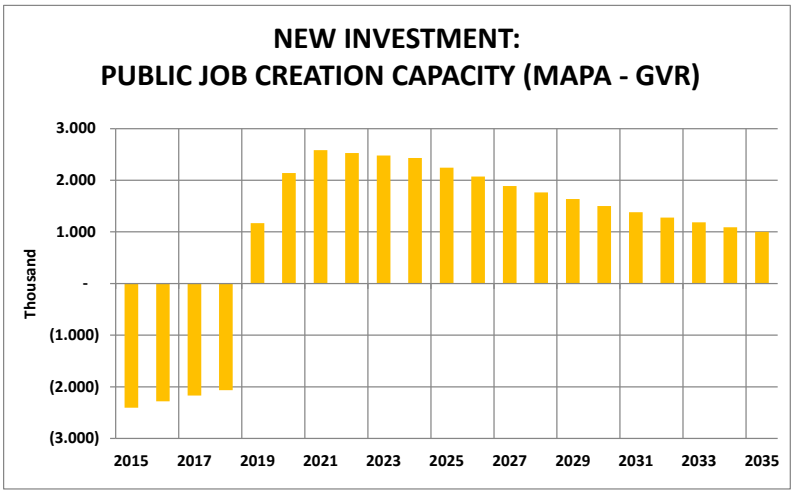
Total oil patch related job creation over 20 years would be about 60 thousand, or annually about 3 thousand.

JOB IMPACT OF NEW OIL PATCH SPENDING (000)	
Development Jobs	12.000
Operations Jobs	12.920
Multiplier Jobs	34.890
Total Jobs	59.810

The direct employment impact from the incremental tax and royalty revenues cannot be forecast, because we don't know how state spending would respond to additional revenues. However, it is possible to estimate generally how the capacity of state government to spend, and consequently to generate jobs in the economy, would change. To do this we assume that spending changes track the changes in revenues. Furthermore, we assume that increases in revenues impact the operating budget (mostly personnel) in the long run. But decreases in revenues in the short run could either reduce the operating budget or the capital budget, in which case the loss in direct jobs would fall mostly on the construction industry.

Direct job creation (Bang per Buck) associated with the operating budget is high because that spending mostly goes to pay personnel costs. Direct job creation associated with the capital budget is lower for the same reasons that it is low for oil patch spending—individual payrolls are high and much of the spending goes for equipment and materials purchase.

This figure shows the direct job creation capacity of public sector spending if the new investment results in new oil taxed at the lower MAPA-GVR effective rate. (The ACES case would show a larger initial job loss, while the other MAPA case would show higher job creation during the production phase.)



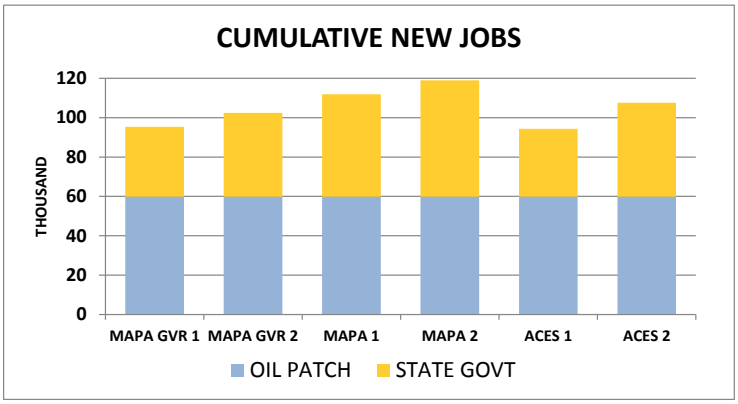
During the new project development phase state revenues would fall, and that would restrict the ability of government to spend on operations or capital. The figure assumes spending cuts commensurate with the cut in revenues. During the production phase the increase in revenues would allow for increased operations spending.

The economic multiplier for direct state spending would not be as high as for direct oil patch spending for two reasons. First, the average payroll per state worker is lower than for the average oil patch worker, so the new purchasing power pumped into the economy per worker would be less. Second, government spending generates fewer jobs in industries providing goods and services in support of that spending.

Total jobs impact associated with the public spending of new revenues would range from about 35 to 59 thousand, depending on the tax in place (how much tax is collected) and where government cuts when revenues fall.

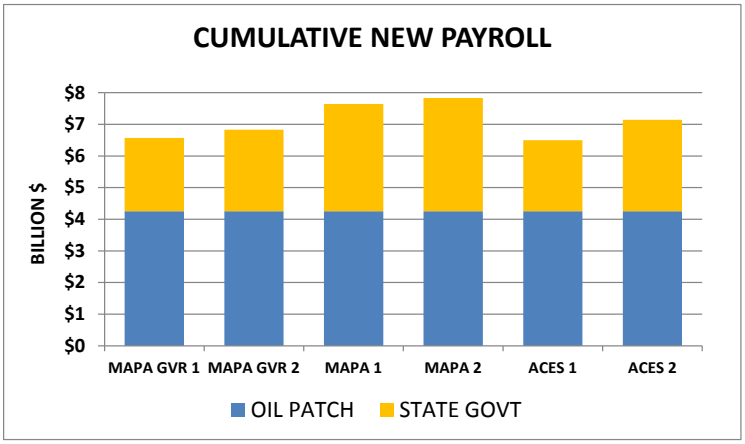
JOB IMPACT OF NEW PUBLIC SPENDING (000)		
	Cut Operations	Cut Capital
MAPA-GVR		
Direct Jobs	21.45	25.71
Multiplier Jobs	14.16	16.97
Total Jobs	35.60	42.68
MAPA-NOT GVR		
Direct Jobs	31.40	35.67
Multiplier Jobs	20.73	23.54
Total Jobs	52.13	59.21
ACES		
Direct Jobs	20.81	28.80
Multiplier Jobs	13.74	19.01
Total Jobs	34.55	47.81

The total jobs impact over 20 years, due to more activity in the oil patch and the increase in state revenues, ranges from 94 thousand to 119 thousand.



TOTAL JOBS IMPACT (000)		
	Cut operations	Cut capital
MAPA-GVR	95.4	102.5
MAPA-NOT GVR	111.9	119.0
ACES	94.4	107.6

The purchasing power (and potential tax base) associated with this increase in employment, as represented by the new payroll, is substantial—ranging from $6.5 to $7.8 billion over 20 years, or about $300 to $400 million per year.



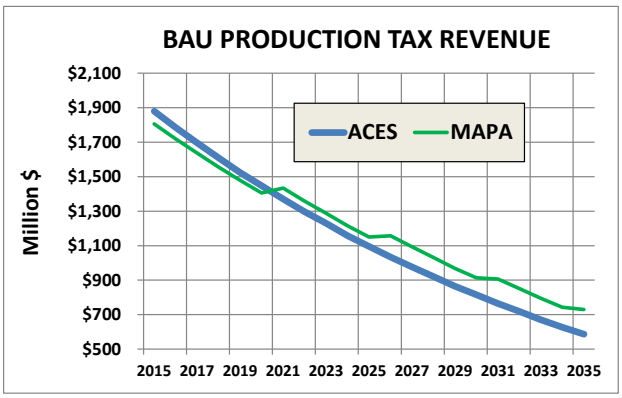
ASSUMPTIONS FOR JOBS ANALYSIS			
CATEGORY	**VALUE**	**SOURCE**	**NOTES**
PETROLEUM			
Direct Investment Bang Per Buck	3 jobs per million $	ISER, Northstar Oil Field: Economic Impact Analysis, 1998– adjusted for inflation	Includes jobs in support sectors like fabrication, transportation, warehousing
Direct Operations Bang Per Barrel	16 per thousand barrels per day, increasing at 5% per year	Author estimate based on current employment and production statistics	Current ratio of 26 per 1000 barrels adjusted down for new accumulation and up for indirect jobs
Multiplier	2.4	McDowell Group, The Role of the Oil and Gas Industry in Alaska's Economy, 2011, p22.	Consistent with RIMSII Multiplier for Alaska from US Dept. of Commerce, Bureau of Economic Analysis
PUBLIC SPENDING			
Operations Bang per Buck	8 jobs per million $	ISER, Alaska Citizen's Guide to the Budget, "Cash on the Street" Job Multipliers for 1999 & The ISER Alaska Input-Output Model, 2000– adjusted for inflation	Much, but not all, of operations spending is for personnel
Capital Spending Bang per Buck	4 jobs per million $	ISER, Alaska Citizen's Guide to the Budget, "Cash on the Street" Job Multipliers for 1999 & The ISER Alaska Input-Output Model 2000– adjusted for inflation	Most direct jobs created in construction industry

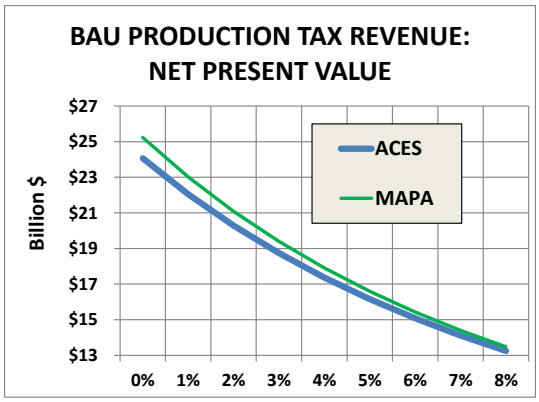
CHANGING FROM ACES TO MAPA

A shift in the production tax from ACES to MAPA that generated new investment would, under a range of reasonable assumptions, increase state revenues and also under any reasonable assumptions would increase employment.

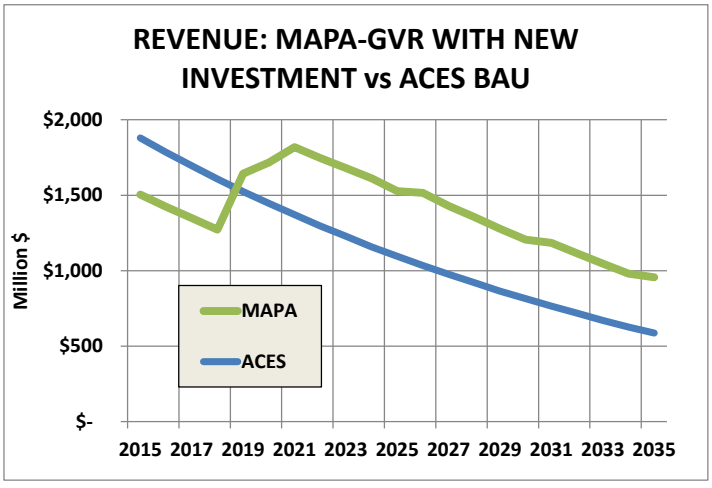
Business as Usual

For example, consider the "business as usual" case from the previous section. The net present value of ACES or MAPA production tax revenues are almost the same at a high discount rate, while MAPA produces a higher net present value at lower discount rates.



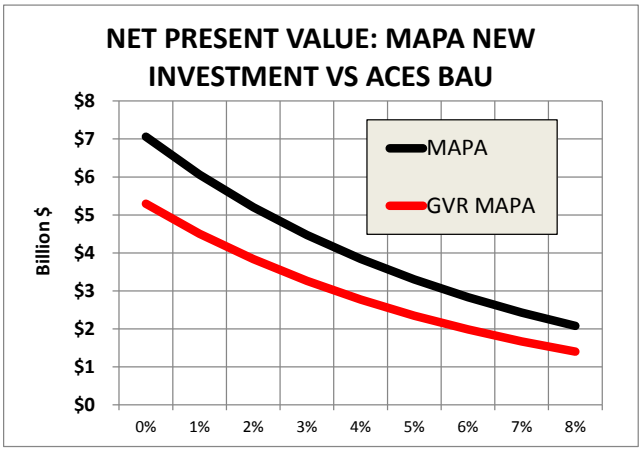


The new investment would initially drop MAPA revenues below ACES, but when new production began, revenues from the production tax and royalties would increase. The production increase would more than offset the somewhat lower tax rate under MAPA-GVR compared with ACES. This figure compares the ACES revenue stream with MAPA-GVR, with the new production.



In this "business as usual case," the shift from ACES to MAPA with the new investment described in the previous section would increase the net present value of future petroleum revenues in two ways. First, revenues would increase because of the shift from ACES to MAPA. Second, revenues would increase because of the new production. The increase in net present

value from these two changes would be between $1.4 and $7.6 billion, depending on the discount rate and whether the new production was eligible for the Gross Value Reduction (GVR).



TOTAL NEW REVENUES: SHIFT TO MAPA WITH NEW INVESTMENT "BUSINESS AS USUAL" (BILLION $)					
	REVENUE FROM SHIFT IN TAX	REVENUE FROM NEW INVESTMENT		TOTAL REVENUE (SHIFT IN TAX + NEW INVESTMENT)	
DISCOUNT RATE		GVR	NOT GVR	GVR	NOT GVR
8%	$0.22	$1.17	$1.85	**$1.40**	**$2.08**
7%	$0.29	$1.38	$2.14	**$1.67**	**$2.43**
6%	$0.36	$1.63	$2.48	**$1.98**	**$2.83**
5%	$0.44	$1.91	$2.86	**$2.35**	**$3.30**
4%	$0.54	$2.23	$3.30	**$2.77**	**$3.84**
3%	$0.66	$2.60	$3.81	**$3.26**	**$4.47**
2%	$0.80	$3.04	$4.40	**$3.83**	**$5.20**
1%	$0.97	$3.54	$5.09	**$4.51**	**$6.06**
0%	$1.16	$4.13	$5.90	**$5.29**	**$7.06**

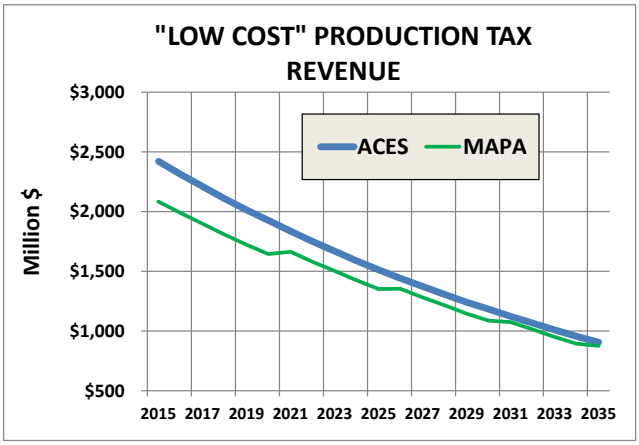
New oil patch employment generated by this switch to MAPA, with new investment, would be the same as calculated in the previous section—59.8 thousand over 20 years. New employment

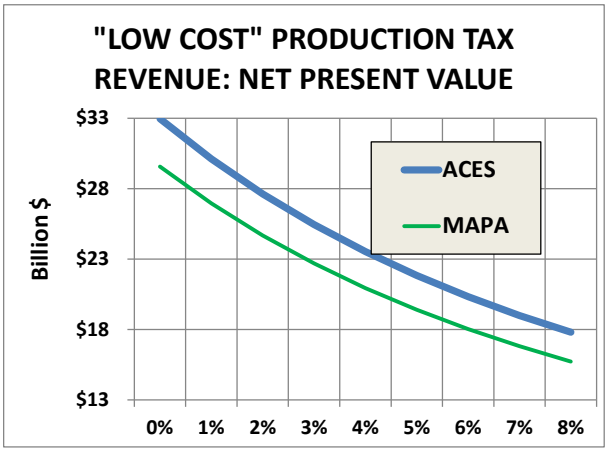
generated by public spending would be somewhat higher than the 39 to 59 thousand calculated in the previous section because of the additional revenues from the shift to MAPA from ACES.

Lower Production Cost

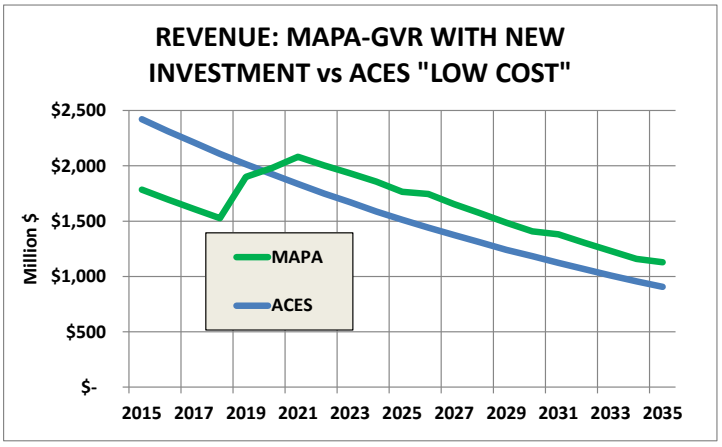
A lower-cost-of-production case demonstrates that the shift from ACES to MAPA can generate an increase in revenues, even if MAPA revenues without new investment are less than ACES. For example, with an initial-year lease cost of $35 per barrel—rather than the $40 assumption in the "business as usual" case—the stream of "low cost" production tax revenues would be greater for ACES than for MAPA, because the ACES tax rate would be higher.

The net present value of that revenue stream would range between $18 and $33 billion for ACES and $16 to $30 for MAPA.

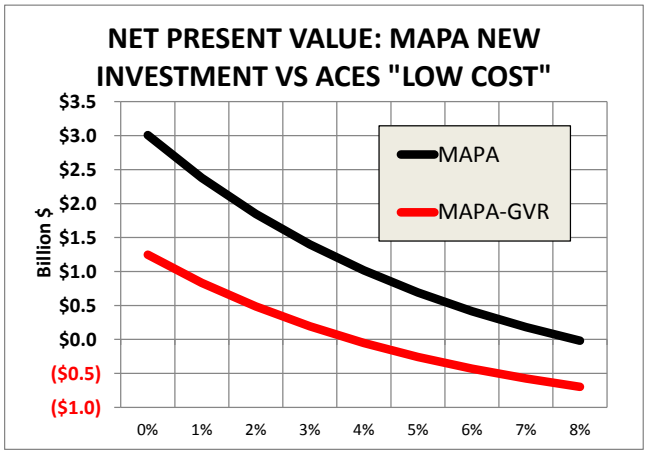




Against this background, the new investment under MAPA would further reduce revenues in the short run, but when production began revenues would increase and exceed those under ACES without the investment. The production increase would more than offset the somewhat lower tax rate under MAPA (GVR) compared with ACES. This figure compares the ACES revenue stream with the MAPA (GVR) revenue stream with new production.



In this case, the shift from ACES to MAPA would reduce revenue, but this would be more than offset at low discount rates by the increase in revenue from the additional investment. The net present value of the shift, combined with the new investment, would range from $3 billion at 0% discount rate to -$.7 billion at 8%.



TOTAL NEW REVENUES: SHIFT TO MAPA AND NEW INVESTMENT "LOW COST" (BILLION $)					
	REVENUE FROM SHIFT IN TAX	REVENUE FROM NEW INVESTMENT		TOTAL REVENUE (SHIFT IN TAX + NEW INVESTMENT)	
DISCOUNT RATE		GVR	NOT GVR	GVR	NOT GVR
8%	($2.07)	$1.37	$2.05	**($0.70)**	**($0.02)**
7%	($2.18)	$1.61	$2.37	**($0.58)**	**$0.18**
6%	($2.31)	$1.88	$2.72	**($0.43)**	**$0.42**
5%	($2.44)	$2.19	$3.14	**($0.26)**	**$0.69**
4%	($2.60)	$2.54	$3.61	**($0.05)**	**$1.02**
3%	($2.76)	$2.96	$4.16	**$0.19**	**$1.40**
2%	($2.95)	$3.44	$4.80	**$0.48**	**$1.85**
1%	($3.16)	$3.99	$5.54	**$0.83**	**$2.38**
0%	($3.40)	$4.64	$6.40	**$1.25**	**$3.01**

General Result

The following table shows that new revenues would still be positive, if production cost or price fluctuated from the "business as usual" case—although the level of new revenues would vary substantially. Most of this variation comes because a tax shift changes the revenue generated

from "business as usual" production. The new tax revenue from new production is not very sensitive to the market assumptions and is always positive.

TOTAL NEW REVENUES:
SHIFT TO MAPA AND NEW INVESTMENT
(BILLION $ at 0% DISCOUNT RATE)

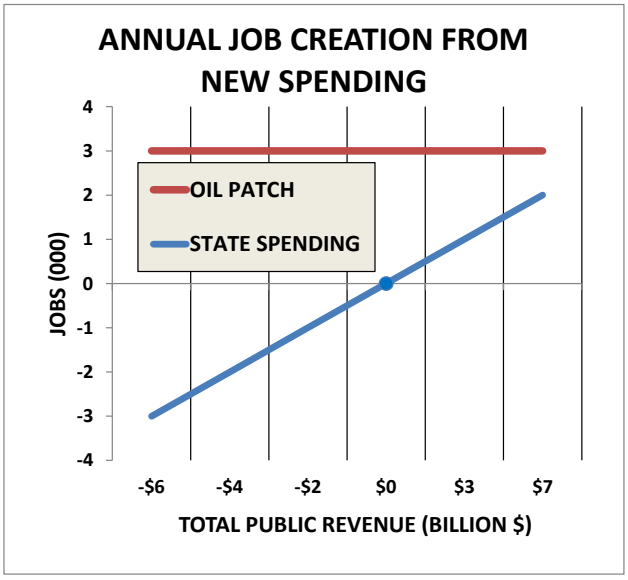
CASE	STARTING VALUE	REVENUE FROM SHIFT IN TAX TO MAPA	REVENUE FROM NEW INVESTMENT WITH MAPA		TOTAL REVENUE (SHIFT IN TAX + NEW INVESTMENT)	
			GVR	NOT GVR	GVR	NOT GVR
BUSINESS AS USUAL	COST = $40 PRICE = $100	$1.16	$4.13	$5.90	**$5.29**	**$7.06**
LOW COST	COST = $35	($3.40)	$4.64	$6.40	**$1.25**	**$3.01**
HIGH COST	COST = $45	$4.79	$3.56	$5.32	**$8.35**	**$10.11**
LOW PRICE	PRICE = $95	$2.38	$3.59	$5.14	**$5.97**	**$7.52**
HIGH PRICE	PRICE = $105	($ .79)	$4.68	$6.66	**$3.89**	**$5.87**

Job Creation

Job creation in the oil patch depends only on the level of new investment, so in this simple analysis the number of new jobs is not sensitive to changing assumptions about price or lease cost.

Job creation from state spending depends on the new revenues from the switch and from the new investment. If the new revenues are positive, there will be public sector job creation, which would augment the job creation in the oil patch. If the new revenues are negative, the decline in public sector jobs would be a partial offset to job creation in the oil patch.

A rough rule of thumb would be that net job creation would be positive unless public sector revenues fell by more than $6 billion as a result of the shift with new investment. Then a 60 thousand job loss from reduced public spending would offset the 60 thousand job gain from new oil patch spending.



WHY PRODUCERS FAVOR MAPA OVER ACES

In recent years the producer tax burden under ACES has been considerably higher than it would have been under MAPA. But in FY 2014 market conditions changed, and the calculated tax burden under ACES or MAPA was almost the same. No one knows with certainty the future direction of market conditions, but under the "business as usual" assumptions used in this analysis, MAPA would actually produce more revenues than ACES in future years even without any incremental production. If that is the case, why would producers prefer MAPA to ACES?

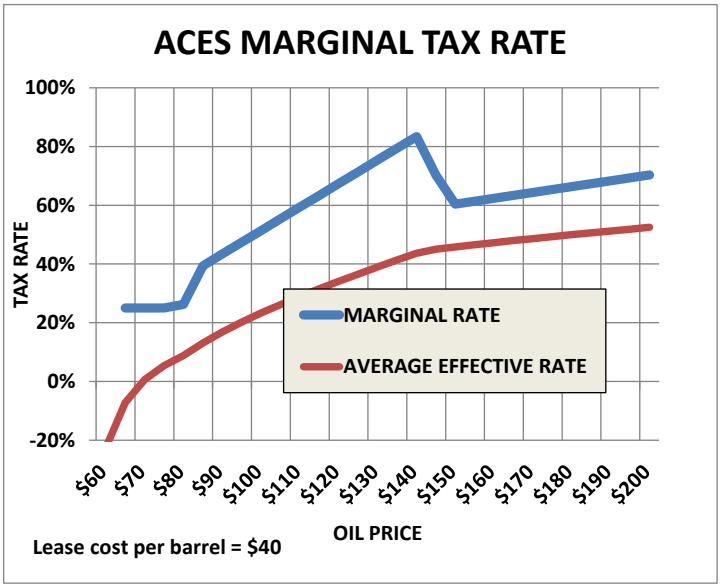
One possibility is that the producers base their investment decisions on higher price and lower cost assumptions than those reflected in the current market and the "business as usual" assumptions. In other words, they think the future will look more like the past than the present. This seems unlikely, since producers tend to be cautious when forecasting future price and cost trends.

Another possibility is that the production generated for each dollar of new investment is considerably higher than reflected in our hypothetical new investment analysis. That would make investing under MAPA relatively more attractive than ACES for producers. Our hypothetical project is based on public information from the producers and may contain a conservative bias regarding the possible ultimate production from actual investments.

But at least four other factors are probably more important in explaining why producers favor MAPA over ACES: the elimination of progressivity in the tax rate, rationalization of the estimation of tax liability, valuation of credits, and special treatment of new oil.

Elimination of Progressivity

With ACES, the nominal tax rate increases with the market price (assuming lease cost constant). Since the higher rate applies to all production, this means that a large share of the additional revenue from the price increase goes to the government as a higher tax liability. For example, at a price of $100, the effective ACES tax rate would be 23%, but the state would take 51% of an increase in the production tax value if the price rose to $101.[xviii]



Elimination of progressivity under MAPA gives the producers a larger share of the take when the price of oil spikes. Industry spokesmen say this is an important consideration when looking at the potential range of future prices, rather than a single price estimate, when evaluating project economics.

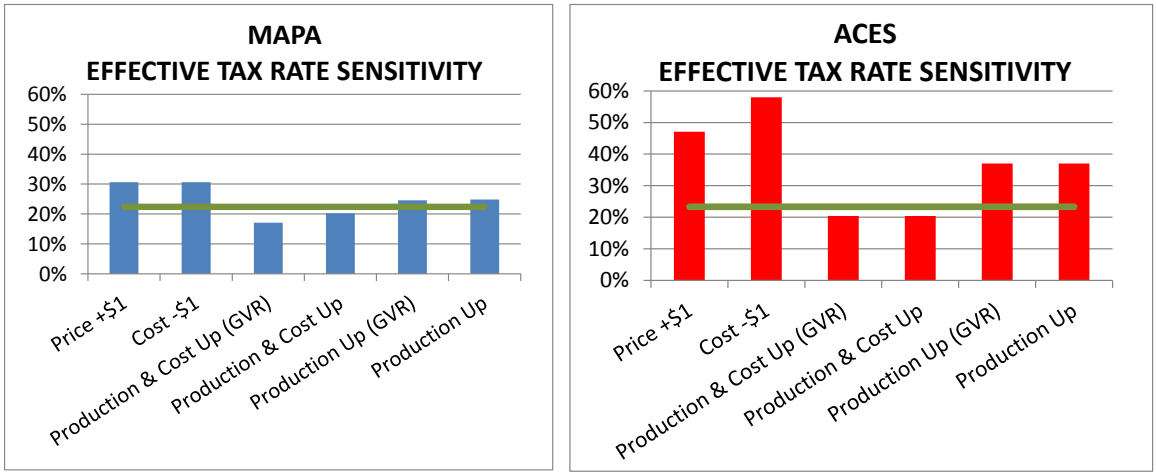
Rationalization of the Estimation of Tax Liability

As we have shown, production tax liability based on production tax value is difficult to forecast and sensitive to market conditions. This makes it particularly challenging for producers to determine whether a potential project will generate a high enough return to justify the investment.

ACES has three features that made it particularly difficult to determine the effective tax rate for a potential investment (the nominal rate net of applicable credits).

First, as noted above, the nominal tax rate changes as the price moves up or down. Second, since the investment cost is a factor in determining both the nominal tax rate (through its influence on production tax value per barrel) and the tax credits, the effective tax rate is even more sensitive to cost than to price.

The following figures compare the average effective tax rate (solid line) compared with the marginal effective tax rate of a price increase, a cost reduction, and a production increase around a $100 price and $40 lease cost. The ACES marginal rates are all very sensitive to fluctuations in these variables, compared with MAPA.



Third, under ACES producers were required to calculate the tax rate each month based on the market price during that time. Because of the progressivity of the tax rate, this meant that the actual annual liability was greater than the liability calculated using the annual average price. But it also meant that the actual annual liability depended on the amount of variability of the price from month to month.

If the monthly price variations were small, the monthly calculation of tax liability would not differ significantly from a single annual calculation.[xix]

But if the monthly price variations are large, the liabilities will differ. For example, if the market price of oil for a year was $100 per barrel, net taxes would be $1.879 billion. However, if the price averaged $100 over the year, but was $120 for half the year and $80 for the other half, net taxes would be $2.134 billion—$255 million (14%) higher than taxes calculated based on an annual price of $100.

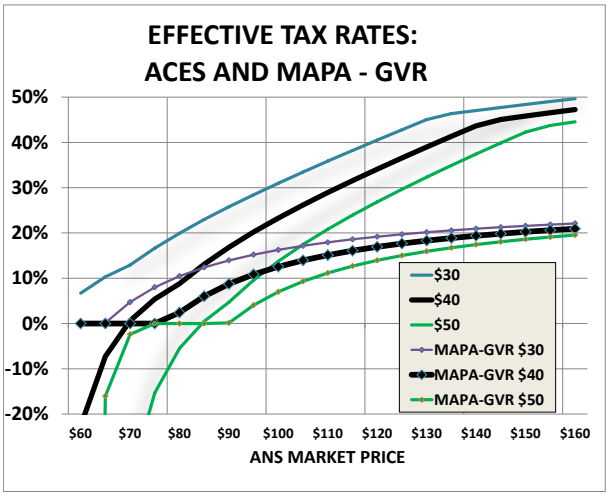
EXAMPLE OF ACES TAX LIABILITY: MONTHLY VS ANNUAL CALCULATION OF RATE					
	Monthly Calculation			Annual Calculation	Difference
Months	6	6	Annualized	12	
Market Price	$120	$80	$100	$100	
Production Tax Value (Million $)	$6,433	$2,783	$9,216	$9,216	
Net Taxes (Million $)	$1,920	$ 214	$2,134	$1,879	$255

Value of Credits

The ACES tax credits were based on the level of lease-related capital expenditures. These credits could significantly reduce the effective tax rate, if they could offset the tax liability on existing production. But without an existing liability, they could not be used immediately—although they could be traded or carried forward. Furthermore, projects with lower investment costs per barrel would benefit less from the credits and more from the MAPA lower nominal tax rate.

Special Treatment of New Oil

The MAPA effective tax rate on certain categories of new oil (a new unit, a new participating area in an existing unit, or an extension of an existing accumulation) is considerably lower than ACES, because it is eligible for a Gross Value Reduction (GVR) when calculating the tax liability.[xx] At an oil price of $100, the MAPA rate varies from 5% to 15% as the lease cost per barrel varies between $50 and $30 per barrel. The ACES rate ranges from 10% to 30% within that same production cost range.



The lower MAPA-GVR effective tax rate makes a high-cost barrel more attractive to develop and produce than under ACES. The stylized comparison of the production tax value for a legacy barrel compared to a marginal barrel (below) shows this. Production tax value includes both the normal return on investment (necessary for the investment to be profitable) and pure profit (the return over and above the amount necessary to make the investment profitable).

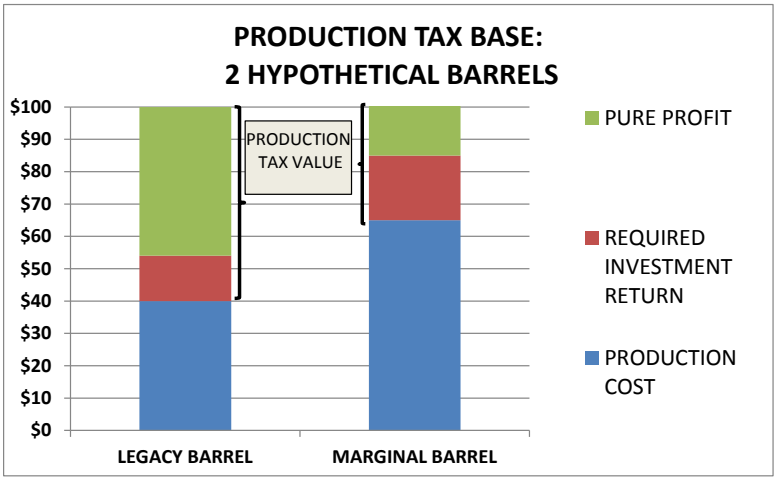
A legacy field will have a low per barrel lease cost and a low per barrel required return to pay back the initial investment. The production tax value is large and a small share of it is normal return.

A marginal field will have a higher per barrel lease cost and a higher per barrel required return to pay back the initial investment. The production tax value will be smaller and a larger share of it will be the normal return.

If the same tax rate is applied to the production tax value for both fields there are 2 possible outcomes. If the tax rate is low, the tax will capture a share of the pure profit from both fields, leaving the producer with the required return to make the investment profitable. Production tax revenues will be low, but both fields will be developed.

If the tax rate is high, the tax will capture all of the pure profit from the marginal field and also some of the required return while capturing a larger share of the pure profit from the legacy field. Production tax revenues will be higher, but only the legacy field will be developed.

If the tax rate on the marginal field can be set lower than on the legacy field, it is possible to capture a large share of the pure profit from the legacy field as tax revenue, and at the same time to develop the marginal field. This could be a better outcome for both producers and the state because production value is higher in this case.



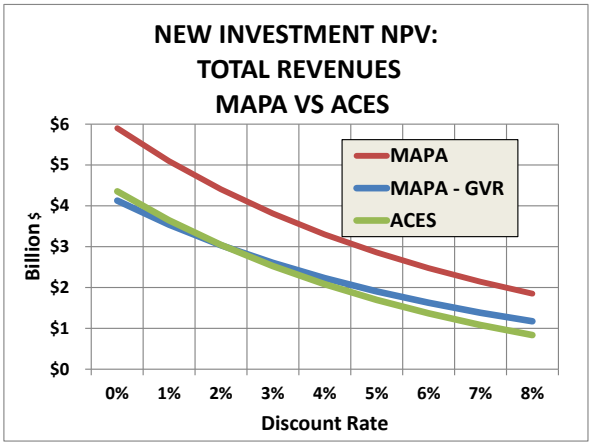
The higher production value means the producers have higher profits, and some of those additional profits can be shared with the government through higher taxes. This would be a win-win situation even if the producers are paying more in taxes. The primary objective of the producers is profit maximization rather than tax minimization.

Appendix: Sensitivity Analyses of New Investments

Estimating future revenues from different versions of a production tax is fraught with uncertainty because the exercise involves several moving parts of which the most important are the assumptions about future market conditions (price and lease cost), assumptions about the characteristics of potential projects to increase production, and assumptions about the characteristics of the producers. The purpose of sensitivity analysis is to see if the conclusions of the analysis change significantly when those assumptions change. Based on the limited sensitivity analyses we have been able to conduct, our conclusions seem to be robust, but additional work in this area would be useful.

Sensitivity of Results to "Business as Usual" Assumptions

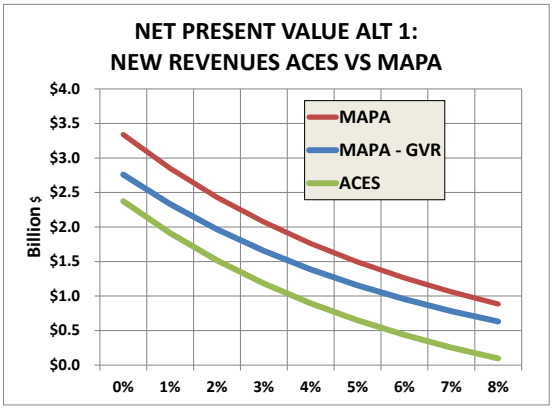
When the new investment occurs in the "business as usual" market environment, the net present value of revenues increases whether the tax regime is MAPA or ACES. If the new investment leads to production of oil from existing fields, revenues from MAPA clearly exceed those from ACES. If production is from new fields, MAPA and ACES revenues would be about the same—depending upon the discount rate.

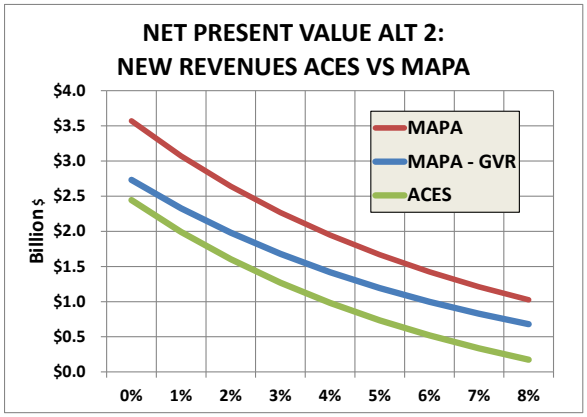


Under different market conditions—with market price growing faster or slower, or lease cost increasing faster or slower--a new investment will still generate higher revenues. As these four alternative scenarios show, MAPA will still generate more revenues than ACES if the new investment is in an existing field.

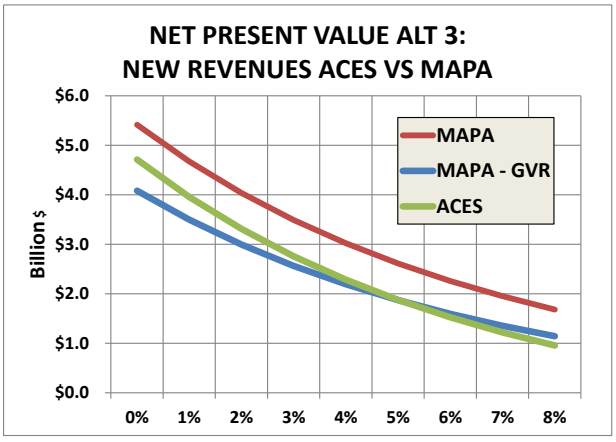
MARKET CONDITIONS SENSITIVITY TEST ASSUMPTIONS					
	BUSINESS AS USUAL	**ALT 1**	**ALT 2**	**ALT 3**	**ALT 4**
Market Price	2%	-1%	0%	1%	0%
Lease Cost	3%	0%	1%	0%	-1%
Production Tax Value	.8%	-3.5%	-2%	1.3%	0%

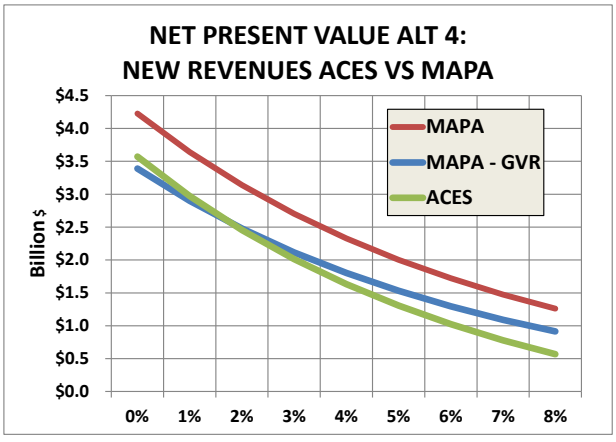
If the new investment is in a new field, MAPA-GVE will do better than ACES if production tax value is lower.





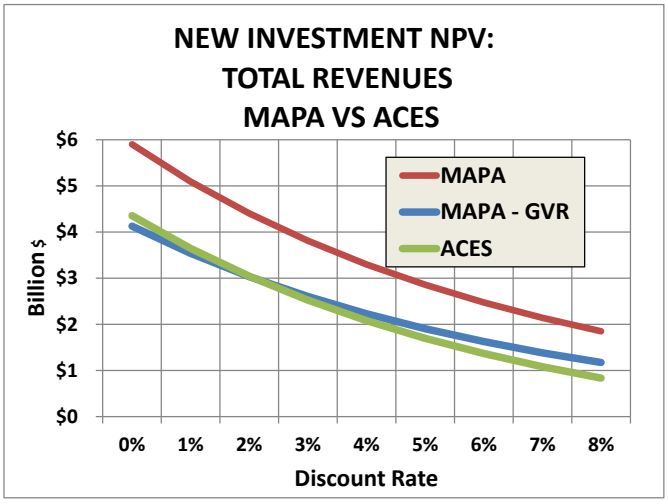
If production tax value is constant or increasing, MAPA-GVE and ACES will generate approximately equivalent revenues.





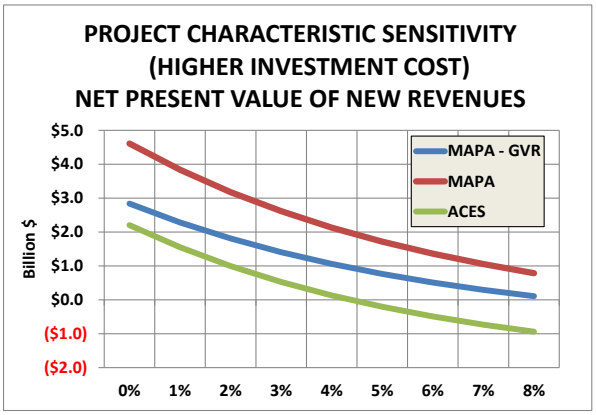
Sensitivity of Results to Project Characteristics

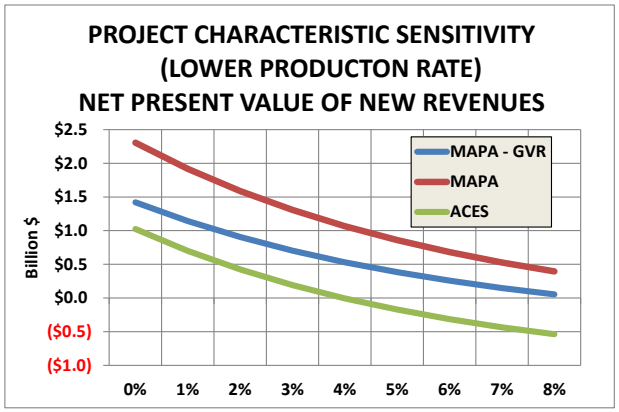
The hypothetical project, with the "business as usual" assumptions, will result in a positive net present value for the incremental revenue stream. The value will be highest for MAPA with oil from an existing field. The value will be lower for MAPA-GVE and ACES. The ACES net present value would be lower at a high discount rate and higher at lower discount rates.



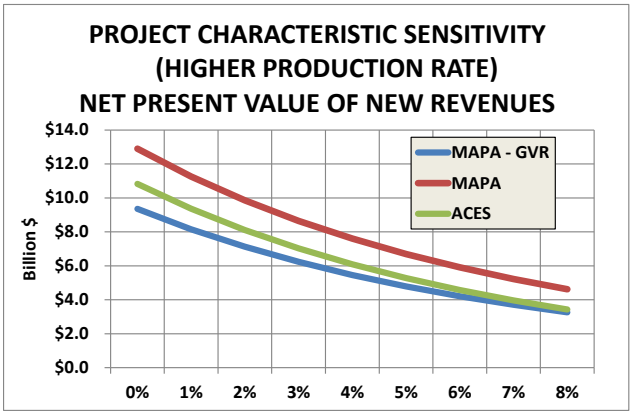
Changing the project characteristics would change the net present value for the project under the different tax regimes because of the two taxes have different effective tax rates during the investment and production project phases.

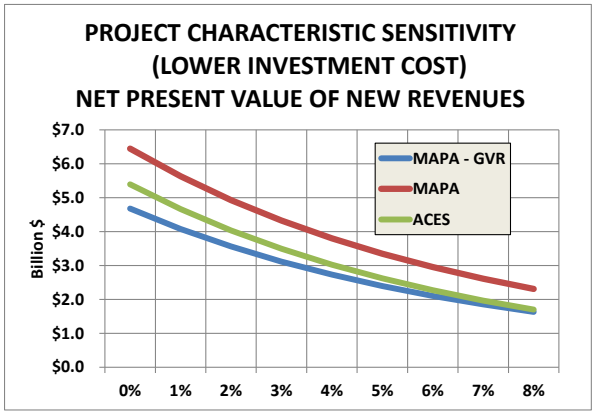
If the investment cost were higher, or the production rate lower, the net present value of the revenue stream from the investment could fall below zero under ACES because the investment tax credits would become more important relative to the production taxes. Either MAPA revenue stream would still be positive.





On the other hand reducing the investment cost or increasing the production rate would increase the net present value of revenues under ACES relative to MAPA. However they would still be less than revenues from MAPA if the incremental oil were from existing fields.





Sensitivity of Results to Producer Characteristics

Presumably producers with different characteristics would have somewhat different tax liabilities for the same production level or the same hypothetical project. This analysis assumes large producers with significant costs and production. Since these producers generate most of the revenue and jobs, the analysis is representative of the industry as a whole, but not necessarily of any particular producer.

Endnotes

[i] The tax rate is not to be confused with another measure of tax liability—PRODUCTION TAX TAKE. Tax take is usually defined as the percentage of the production tax value including royalties that a producer pays in production taxes.

PRODUCTION TAX TAKE = TAX LIABILITY / (PRODUCTION TAX VALUE + ROYALTIES)

[ii] It is sometimes referred to as Gross Value Exclusion oil.

[iii] Both ACES and MAPA are subject to a minimum tax which is 4% of the wellhead value excluding royalties—Gross Value at Point of Production (GVPP).

[iv] The credit is not applicable to royalty oil.

[v] It cannot be used to offset the minimum tax.

[vi] A credit purchase by the state appears in the state operating budget as an expenditure.

[vii] Excluding royalties.

[viii] Fiscal Note 14, HCS CSSB 21(FIN), 4/12/13.

[ix] The lease cost here is calculated as the average over all barrels produced. The lease cost is sometimes presented as the average over only the taxable barrels (excluding royalty production). It might be suggested that the cost increase was a response to the tax change. If that were the case it would mean investment increased. This would result in higher future production and revenues under MAPA.

[x] The figure assumes production of 500 thousand barrels per day of which 35 thousand is eligible for the gross value reduction (GVR) under MAPA. Transportation cost per barrel is $9.50.

[xi] The lease cost per taxable barrel of $40 is comparable to a lease cost of about $35 averaged over all barrels.

[xii] This is a rough estimate because the figure is based on production of 500 thousand barrels per day. Actual production in these years was somewhat higher.

[xiii] We assume 62% of this is capital spending and the remainder operations spending.

[xiv] We assume a constant royalty rate of 12.5% and constant GVR oil of 35 thousand barrels per day.

[xv] The production tax value is not a measure of producer profit.

[xvi] We assume the lease cost per barrel returns to the business as usual level after the 4 year investment period ends.

[xvii] For simplicity we assume all incremental royalties are spent through the general fund although 25% would flow into the Permanent Fund. This simplification does not materially impact the results.

[xviii] The marginal tax rate falls above $140 because the growth rate in the average rate drops.

[xix] For example in calendar year 2013 the average annual price was $107.61 and the average monthly deviation from that average was $3.15. The variation in the monthly tax rate would then have been about 1% around the annual average. That small amount of deviation around the annual average would not have had a noticeable impact on the annual tax liability.

[xx] This will be the case unless the production tax value per barrel is very low at which point the ACES credits reduce the current year tax liability below zero.