Discussion Slides: Alaska Senate Resource Committee

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PFC Energy

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“The art of taxation consists in so plucking the goose as to get the most feathers with the least hissing.”

Jean Baptiste Colbert - Economist and Minister of Finance under King Louis XIV of France, 1619
The art of taxation consists in maximizing revenues, subject to two important constraints

- **Efficiency:** Not distorting investment choices, or preventing marginal investments that would otherwise have been made from occurring

- **Competitiveness:** Ensuring that in the real world, which is characterized by limited capital with competing uses
Efficiency: Conclusions on a Fixed Percentage Royalty

• The fixed royalty is **inefficient** because it distorts investment, making previously marginal projects uneconomic at a given price

• It is highly **regressive** with regard to both price and cost, because Relative Government Take falls as prices rise, and as costs fall

• This also increases **sovereign risk** – since when prices rise, governments will be tempted to set a new rate, even though investments have been made on the basis of the current one

• It has only one major strength – it is very **simple to administer**, requiring knowledge of only 2 variables - production and price
Efficiency: Targeting Economic Rent

- What we would like to do instead is to tax the red bars – the Economic Rent – directly.
- That way, we could *pluck more feathers*, with less *hissing*.
- What are the different ways, over time, that governments have attempted to do this?
Progressivity

- Progressivity may be used for a range of different purposes in a fiscal regime
  - In some cases, used to counterbalance the inherent regressivity of other elements of the regime
  - In other cases, a deliberate policy to not only a steady share of the rents, but to capture ever more as economics improve

- Implemented properly (ie taxing only economic rents), both of these approaches can be efficient – ie non-distorting of relative investment opportunities at the margin

- Regimes that use both high levels of relative government take, in addition to high progressivity to capture most or all of the upside of high price environments are will not necessarily, however, be competitive

![Graph showing capital costs, operating costs, normal return on capital, and rent over time.](image-url)
Different Implementations of Progressivity: Production Levels

- One of the earliest and still commonest metrics used to progressively increase rates of government take for projects that produce more economic rent has been the use of sliding scales for the split of profit oil or the setting of a royalty, based on levels of production, as is the case in Vietnam’s PSC fiscal system

- Brazil similarly applies a production-level-based windfall profits tax in its tax-royalty system

- Such systems are almost always bracketed, so the higher rate applies only to production above a given threshold

- Production-based progressivity uses production levels as a proxy for profitability – and it is an imperfect proxy at best
  - The Vietnam example here attempts to improve here by setting different tiers, based on project cost
  - British Columbia, Canada uses a combination of Price and Production Quantity in its progressive Royalty rate

<table>
<thead>
<tr>
<th>Vietnam Fiscal Terms</th>
<th>Pre-2010</th>
<th>Post-2010 with Incentives</th>
<th>Post-2010 without Incentives</th>
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A number of regimes are progressive explicitly on price. This approach is particularly common in setting “windfall profits” taxes. China and Venezuela both use a price-progressive windfall profits tax to capture progressive shares of economic rent in high price environments. Such systems are almost always bracketed, taxing only profits resulting from the higher price bracket at the higher rate. Alaska’s ACES system is an exception to this rule.
A more sophisticated approach to targeting economic rent more directly is for a regime to be progressive using the extent to which a project has recovered its costs as a metric by which to set the tax or profit sharing rate.

Malaysia’s current PSC model, introduced in 1997, uses “R-Factor”, the ratio of cumulative revenues to cumulative costs, to set its profit split and its cost limit.

Once a project has recovered its costs, profit share to the IOC is progressively reduced.

### Malaysia Fiscal Terms

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<th>Unutilized Cost Oil/Gas Split (below THV)</th>
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<th>Profit Oil/Gas Split (below THV)</th>
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Threshold Value (THV) - Oil: 30 mmbbls
Threshold Value (THV) - Gas: 0.75 tcf
Similarly, some regimes seek to target “super-profits” more directly by linking progressivity to the Internal Rate of Return (IRR) that a project has accomplished by any point in time.

- Angola’s PSC regime uses IRR to set the profit oil split
  - Onshore and Shallow Water

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<th>IRR</th>
<th>Contractor’s Share</th>
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- Deepwater

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Many of these regimes are highly complex, and use highly imperfect proxies for targeting economic rent. Australia’s Petroleum Resource Rent Tax, by contrast, is unusual in being both very simple in design, and in seeking to tax economic rent directly. The tax seeks to replicate the economics of a 40% direct participation by the state, by taxing net cashflow at a rate of 40%. All losses, however, are carried forward indefinitely, and maintain present value since they are inflated each year by a rate similar to the corporate cost of capital. The ultimate economics are as if government is paying a 40% share of the cost of development, and taking a 40% share of the resulting cashflow. With no royalty, and no other taxes in the system other than Corporate Income Tax, this is one of the simplest fiscal designs anywhere, but also one of the most efficient – because it taxes rent directly.
Finding the Intersection

Efficiency

- Efficient regime does not have a distorting effect on project economics
- But rates are too high, and other jurisdictions are more successful in attracting capital as a result

Competitiveness

- Regime does not distort investment
- Rates are internationally competitive, given fundamental attractiveness of the opportunity
- Lower rates may mean for certain projects or asset types, the regime is highly internationally competitive
- But distorting structure means certain otherwise marginal projects are unviable
• It is average or effective rates, not marginal rates that drive project economics at a given price level
• Marginal rates remain, however, a useful metric for understanding key aspects of a regime
• The **difference between marginal and average** rates enable us to understand how **progressive a regime** is on a comparative basis
• Marginal rates represent the combination of high average rates with high progressivity
• In a profit-based system, high marginal rates may create perverse incentives with regard to cost control, encouraging “gold-plating”
Benchmarking Progressivity for a Range of Global Regimes

Progressivity (Average less Marginal Take) of Global Fiscal Regimes at $100/bbl
Benchmarking Progressivity for a Range of Global Regimes

Progressivity (Average less Marginal Take) of Global Fiscal Regimes at $140/bbl

-10% -5% 0% 5% 10% 15% 20%

Bolivia
Libya
Syria
Pakistan
US - GOM
Canada - Alberta Conv.
Australia
US - LA
US - ND
US - TX
India
Uzbekistan
Malaysia
Brazil
Congo, Rep. of the
Peru
UAE
China
Canada - Nova Scotia
Ireland
Gabon
Netherlands
Angola
Egypt
Trinidad
New Zealand
Philippines
Cote d'Ivoire
Yemen
Indonesia
UK
Oman
Tunisia
Canada - Alberta OS
Venezuela
US - AK
Colombia
Equatorial Guinea
Canada - Alberta Conv.
Algeria
Argentina
Azerbaijan
Kazakhstan
Angola
Nigeria
Kenya
Norway
Vietnam
Russia
Egypt
Trinidad
New Zealand
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Indonesia
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US - ND
US - LA
Australia
Canada - Alberta Conv.
US - GOM
Pakistan
Syria
Libya
Bolivia
Regime Competitiveness: Relative Government Take

Relative (Average) Government Take at $100/bbl

- Ireland
- Peru
- New Zealand
- Canada - Nova Scotia
- US - GOM
- Denmark
- Gabon
- Brazil
- US - TX
- Angola
- Algeria
- Vietnam
- Norway
- Indonesia
- Kazakhstan
- US - AK
- Malaysia
- Venezuela
- Russia
- Congo, Rep. of the
- Thailand
- China
- India
- Cote d'Ivoire
- US - LA
- Netherlands
- Yemen
- Egypt
- UK
- Libya
- Australia
- UAE
- Nigeria
- Canada - Alberta Conv.
- Philippines
- Argentina
- US - ND
- Equatorial Guinea
- Colombia
- Canada - Alberta OS
- US - GOM
- Brazil
- Gabon
- Denmark
- US - GOM
- Canada - Nova Scotia
- New Zealand
- Peru
- Ireland

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Cash Flow Analysis - $100 ANS West Coast

Level & Composition of Government Take

Level & Composition of Relative Government Take
Cash Flow Analysis - $100 ANS West Coast

Level & Composition of Government Take

Level & Composition of Relative Government Take

ANS West Coast Crude Price

Price NPV IRR
$40 $ 30 11%
$60 $ 413 18%
$100 $ 1,024 26%

Royalty Production Tax Property Tax State CIT Total State Take Federal CIT Total CT

ANS West Coast Crude Price

ANW West Coast

NPV IRR
$40 $ 30 11%
$60 $ 413 18%
$100 $ 1,024 26%
ACES As Enacted

Cash Flow Analysis - $100 ANS West Coast

Level & Composition of Government Take

Level & Composition of Relative Government Take
Limitations on Price Upside: A Probabilistic Approach

- PPT (Proposed) - EV $1573
- PPT (Enacted) - EV $1128
- ACES (Proposed) - EV $1086
- ACES (Enacted) - EV $872
ACES – Capped at Maximum of 70%

Cash Flow Analysis - $100 ANS West Coast

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<th>Royalty</th>
<th>Production Tax</th>
<th>Property Tax</th>
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Level & Composition of Government Take

Level & Composition of Relative Government Take

ANS West Coast Crude Price

Opex, Capex, Revenue, ATCF

Price, NPV, IRR

ANS West Coast Crude Price

Federal CIT, State CIT, Property Tax, Production Tax, Royalty

$mm Cash Flow Analysis - $100 ANS West Coast

Opex, Capex, Revenue, ATCF

Price, NPV, IRR

ANS West Coast Crude Price

Federal CIT, State CIT, Property Tax, Production Tax, Royalty
ACES – Capped at Maximum of 60%

Cash Flow Analysis - $100 ANS West Coast

Level & Composition of Government Take

Level & Composition of Relative Government Take

ANS West Coast Crude Price

Price | NPV | IRR
--- | --- | ---
$40 | $30 | 11%
$60 | $92 | 18%
$100 | $122 | 24%

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<th>Production Tax</th>
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**ACES – Capped at Maximum of 50%**

Cash Flow Analysis - $100 ANS West Coast

- **Opex**
- **Capex**
- **Revenue**
- **ATCF**

Level & Composition of Government Take

- **Federal CIT**
- **State CIT**
- **Property Tax**
- **Production Tax**
- **Royalty**

Level & Composition of Relative Government Take
Limitations on Price Upside: A Probabilistic Approach

NPV, $mm

- PPT (Proposed) - EV $1573
- Capped 70% - EV $873
- Capped 60% - EV $880
- Capped 50% - EV $948
- ACES (Enacted) - EV $872

Probability %
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