International Petroleum Fiscal Systems and Production Sharing Contracts

Course Workbook

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Exercise – Simple Royalty/Tax System

Calculate "take" for both Government and Contractor based on the following information:

- **Royalties = 20%**
- **Income tax rate = 35%**
- **Example #1** Total operating and capital costs = 40% of gross revenues
- **Example #2** Total operating and capital costs = 20% of gross revenues

	Example #1	**Example #2**	
Step 1	100%	100%	Gross Revenues
	-		Royalties
	=		Net Revenue percentage
Step 2	-		Costs as a % of gross revenues
	=		Taxable revenues
Step 3	-		Income tax (35% of taxable revenues)
	=		Contractor after-tax net cash flow [as a percentage of gross revenues]
Step 4	100%	100%	Gross Revenues
	-		Costs (as a % of gross revenues)
	=		Economic Profits [as a % of gross revenues]
Step 5	%	%	Contractor after-tax net cash flow [From Steps 1-3]
	÷ %	%	Total profits [From Step 4]
	= %	%	Contractor Take Contractor share of Economic Profits
Step 6	%	%	Government after-tax net cash flow [Royalty + Tax (in this case)]
	÷ %	%	Total economic profits [From Step 4]
	= %	%	Government Take This is the complement of Company Take

Government Take

Government take represents the Government share of economic profits from all means by which the State extracts rent: Bonuses, royalties, profit oil, taxes, Government working interest, etc. Because of the dynamics of bonuses, royalties, cost recovery limits, sliding scales and various other mechanisms, there can be various levels of Government take for any given system depending upon a variety of circumstances. Thus 4 separate statistics are used here to characterize Government take.

GOVERNMENT TAKE

The Common Denominator

Take definitions:

Economic profit ($) = Cumulative gross revenues less cumulative gross costs over life of the project (full cycle). Also referred to as Cash Flow.

Government take (%) = Government receipts from royalties, taxes, bonuses, production or profit sharing, and Gvt. participation, divided by total Economic profit

Company take (%) = 1 - Government Take
= Contractor net cash flow divided by Economic profit

Contractor take (%) = 1 - Government Take (excluding Gvt. participation)
= Company net cash flow divided by Economic profit

Here a distinction is made between Contractor (or more precisely Contractor Group) and an individual company within the Contractor Group.

The following different Government take statistics (Downside, Mid-range, Upside, etc) correspond to various degrees of profitability which are ordinarily a function of oil prices, field size, costs, timing etc. The natural question is: "Which statistic is more representative or more important or are they all of equal importance?" Good question. It depends on the size of a discovery and various other parameters what the level of government take might be in any given situation and for any given fiscal or contractual system. However, from the *exploration* point of view which is so strongly characterized by high risks, the kind (size) of prospects required to justify taking such risks are usually such that the expected take is in the "Upside Government take" range (whatever that might be).

Downside Government take

This statistic is usually associated with smaller fields (less than 50 to 100 MMBBLS) combined with relatively higher costs or lower oil (or gas) prices or a combination of these conditions. Typically this results in situations where total costs relative to gross revenues (full-cycle) exceed 50 to 60%. These situations almost always result in marginal or submarginal discoveries/fields (depending upon the fiscal terms and accumulated sunk costs prior to the development decision).

Mid-range Government take

This statistic typically represents medium to large fields (75 – 150 MMBBLS) with relatively lower costs and/or higher oil prices. Typically this results in situations where total costs relative to gross revenues are around 30-35%.

Upside Government take

This statistic represents what might be expected for larger fields > 100 MMBBLS with low costs and/or higher prices or a combination of these resulting in costs relative to gross revenues on the order of 20%± or so.

Margin (Marginal Government take)

Marginal take can be viewed different ways. It represents the division of profits on an incremental increase in oil prices. Therefore it often represents a minimum Government take. However, it will not necessarily represent a minimum for systems with depletion allowances, ROR features or "R" factors. The terminology causes some confusion, because marginal take does not coincide with Government take for "marginal" or "sub-marginal" fields referred to here as "downside" Government take. This statistic (Downside Government take) ordinarily is greater than *marginal* Government.

Government Take Mechanics

Another royalty/tax system is used here as an example. It is comprised of:

Royalty	10%	
Special Petroleum Tax Rate		40%
Income Tax Rate		30%

First – While it is convenient to work with percentages, this approach also works with barrels or dollars. Start with $20.00/BBL. This represents average gross revenues per barrel over the life of a field—"full cycle" (or the life of a contract). Royalty is subtracted from gross revenues. The result is net revenue.

Second – An estimate of the overall development and operating costs must be made, say $5.65/BBL and this is deducted from net revenue for tax calculation purposes. This $5.65 consists of capital costs (depreciated typically) and operating costs.

Over the life of a project (full cycle), these costs typically range from 20 to 40% of gross revenues. If costs exceed this level then it is likely a project will be submarginal depending on the fiscal system. A quick-look estimate should focus on a hypothetically profitable venture. Companies normally do not develop sub-economic fields. And they certainly do not purposely *explore* for them. The $5.65/BBL represents 28.25% of gross revenues ($20.00/BBL).

Third - Subtract taxes, levies, etc. This gives the Company share of profits.

Fourth - Divide the contractor share of profits by total profits. This is company take. Government take is the complement of that. Government take of course could also have been calculated directly by adding all means by which the Government extracted rent and dividing by total profits.

Royalty/Tax System Flow Diagram

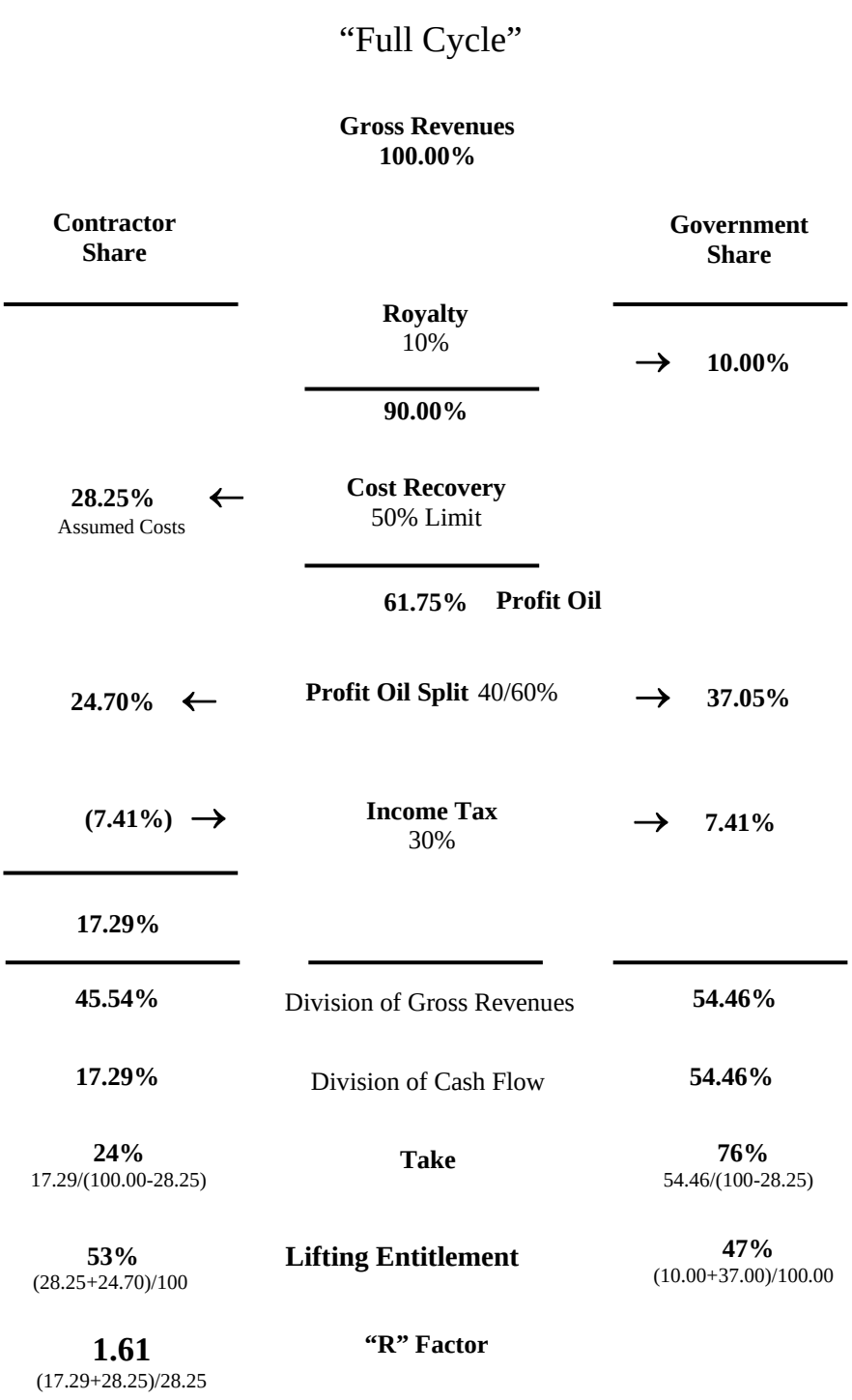
One Barrel of Oil

"Full Cycle"

Company Share				Government Share
		Gross Revenues $20.00		
		Royalty 10%	→	**$2.00**
		$18.00		
$5.65	←	**Deductions**		
Assumed Costs				
		$12.35	**Taxable Income**	
$4.94	←	**Special Oil Tax** 60%	→	**$7.41**
($1.48)	→	**Income Tax** 30%	→	**$1.48**
$3.46				
$9.11		Division of Gross Revenues		**$10.89**
$3.46		Division of Cash Flow		**$10.89**
24% $3.46/($20.00-5.65)		**Take**		**76%** $10.89/($20.00-5.65)
90%		**Lifting Entitlement**		**10%**
1.61 ($3.46+$5.65)/$5.65		**"R" factor**		

Royalty Tax System Flow Diagram

Indonesian-Type PSC Flow Diagram — First Example



Example Indonesian-Type PSC Cash Flow Projection

Field X 100 MMBBLS

Year	Annual Oil Production (MBBLS)	Oil Price ($/BBL)	Gross Revenues ($M)	Royalty 10% ($M)	Net Revenue ($M)	Capital Costs ($M)	Opex ($M)	Deprec-iation ($M)	C/R C/F ($M)	Cost Recovery ($M)
	A	B	C	D	E	F	G	H	I	J
1	0	$20.00				30,000				0
2	0	$20.00				40,000				0
3	578	$20.00	11,560	1,156	10,404	100,000	3,156	34,000		5,780
4	6,100	$20.00	122,000	12,200	109,800	60,000	16,200	46,000	31,376	61,000
5	9,420	$20.00	188,400	18,840	169,560	70,000	22,840	60,000	32,576	94,200
6	12,400	$20.00	248,000	24,800	223,200		28,800	60,000	21,216	110,016
7	10,850	$20.00	217,000	21,700	195,300		25,700	60,000		85,700
8	9,494	$20.00	189,880	18,988	170,892		22,988	26,000		48,988
9	8,307	$20.00	166,140	16,614	149,526		20,614	14,000		34,614
10	7,269	$20.00	145,380	14,538	130,842		18,538			18,538
11	6,360	$20.00	127,200	12,720	114,480		16,720			16,720
12	5,565	$20.00	111,300	11,130	100,170		15,130			15,130
13	4,869	$20.00	97,380	9,738	87,642		13,738			13,738
14	4,261	$20.00	85,220	8,522	76,698		12,522			12,522
15	3,728	$20.00	74,560	7,456	67,104		11,456			11,456
16	3,262	$20.00	65,240	6,524	58,716		10,524			10,524
17	2,854	$20.00	57,080	5,708	51,372		9,708			9,708
18	2,498	$20.00	49,960	4,996	44,964		8,996			8,996
19	2,185	$20.00	43,700	4,370	39,330		7,370			7,370
20										
	100,000		**2,000,000**	**200,000**	**1,800,000**	**300,000**	**265,000**	**300,000**		**565,000**

Year	Total Profit Oil ($M)	Gvt. Share ($M)	Company Share ($M)	Bonus ($M)	TLCF ($M)	Taxable Income ($M)	Income Tax 30% ($M)	Contractor Cash Flow ($M)	
								Undiscounted	12.5% DCF
	K	L	M	N	O	P	Q	R	S
1	0	0		5,000	0	(5,000)		(35,000)	(32,998)
2	0	0			(5,000)	(5,000)		(40,000)	(33,522)
3	4,624	2,774	1,850		(5,000)	(34,526)		(95,526)	(71,161)
4	48,800	29,280	19,520		(34,526)	(16,206)		4,320	2,861
5	75,360	45,216	30,144		(16,206)	25,298	7,589	23,915	14,076
6	113,184	67,910	45,274			66,490	19,947	106,543	55,742
7	109,600	65,760	43,840			43,840	13,152	90,688	42,175
8	121,904	73,142	48,762			48,762	14,628	60,133	24,858
9	114,912	68,947	45,965			45,965	13,789	46,175	16,967
10	112,304	67,382	44,922			44,922	13,476	31,445	10,271
11	97,760	58,656	39,104			39,104	11,731	27,373	7,947
12	85,040	51,024	34,016			34,016	10,205	23,811	6,145
13	73,904	44,342	29,562			29,562	8,868	20,693	4,747
14	64,176	38,506	25,670			25,670	7,701	17,969	3,664
15	55,648	33,389	22,259			22,259	6,678	15,581	2,824
16	48,192	28,915	19,277			19,277	5,783	13,494	2,174
17	41,664	24,998	16,666			16,666	5,000	11,666	1,671
18	35,968	21,581	14,387			14,387	4,316	10,071	1,282
19	31,960	19,176	12,784			12,784	3,835	8,949	1,013
20									
Total	**1,235,000**	**741,000**	**494,002**				**146,698**	**342,300**	**60,736**

Example Indonesian-Type PSC Cash Flow Projection

Government Cash Flow

Year	Bonuses ($M)	Royalty 10% ($M)	Gvt. 60% Profit Oil ($M)	Income Tax 30% ($M)	Government Cash Flow ($M)	
					Undiscounted	12.5% DCF
	N	D	L	Q	T	U
1	5,000				5,000	4,714
2					0	0
3		1,156	2,774		3,930	2,928
4		12,200	29,280		41,480	27,467
5		18,840	45,216	7,589	71,645	42,170
6		24,800	67,910	19,947	112,657	58,941
7		21,700	65,760	13,152	100,612	46,791
8		18,988	73,142	14,628	106,759	44,133
9		16,614	68,947	13,789	99,351	36,507
10		14,538	67,382	13,476	95,397	31,159
11		12,720	58,656	11,731	83,107	24,129
12		11,130	51,024	10,205	72,359	18,674
13		9,738	44,342	8,868	62,949	14,440
14		8,522	38,506	7,701	54,729	11,160
15		7,456	33,389	6,678	47,523	8,614
16		6,524	28,915	5,783	41,222	6,642
17		5,708	24,998	5,000	35,706	5,114
18		4,996	21,581	4,316	30,893	3,933
19		4,370	19,176	3,835	27,381	3,098
20						
Total	**5,000**	**200,000**	**741,000**	**146,700**	**1,092,700**	**390,612**

A) Production Profile Thousands (M) barrels/year
B) Crude Price
C) Gross Revenues Thousands of dollars ($M)
D) Royalty 10% = (C * .10)
E) Net Revenues = (C – D)
F) Capital Costs
G) Operating Costs (Expensed)
H) Depreciation of Capital Costs (5-year SLD)
I) Cost Recovery C/F (if G + H + I > 50% of C)
J) Cost Recovery = (G + H + I) up to 50% of C
K) Total Profit Oil = (C – D – J)
L) Government Share P/O 60% = (K * .60)
M) Contractor Share P/O 40% = (K – L)
N) Signature Bonus
O) TLCF (See Column P)
P) Taxable Income = (C – D – G – H – L – N)
Q) Income Tax (30%) = [if P > 0, P * .30]
R) Company Cash Flow = (E – F – G – L – N – Q)
T) Government Cash Flow = (D + L + N + Q)

Indonesian-Type PSC - Flow Diagram — Second Example

One Barrel of Oil

"Full Cycle"