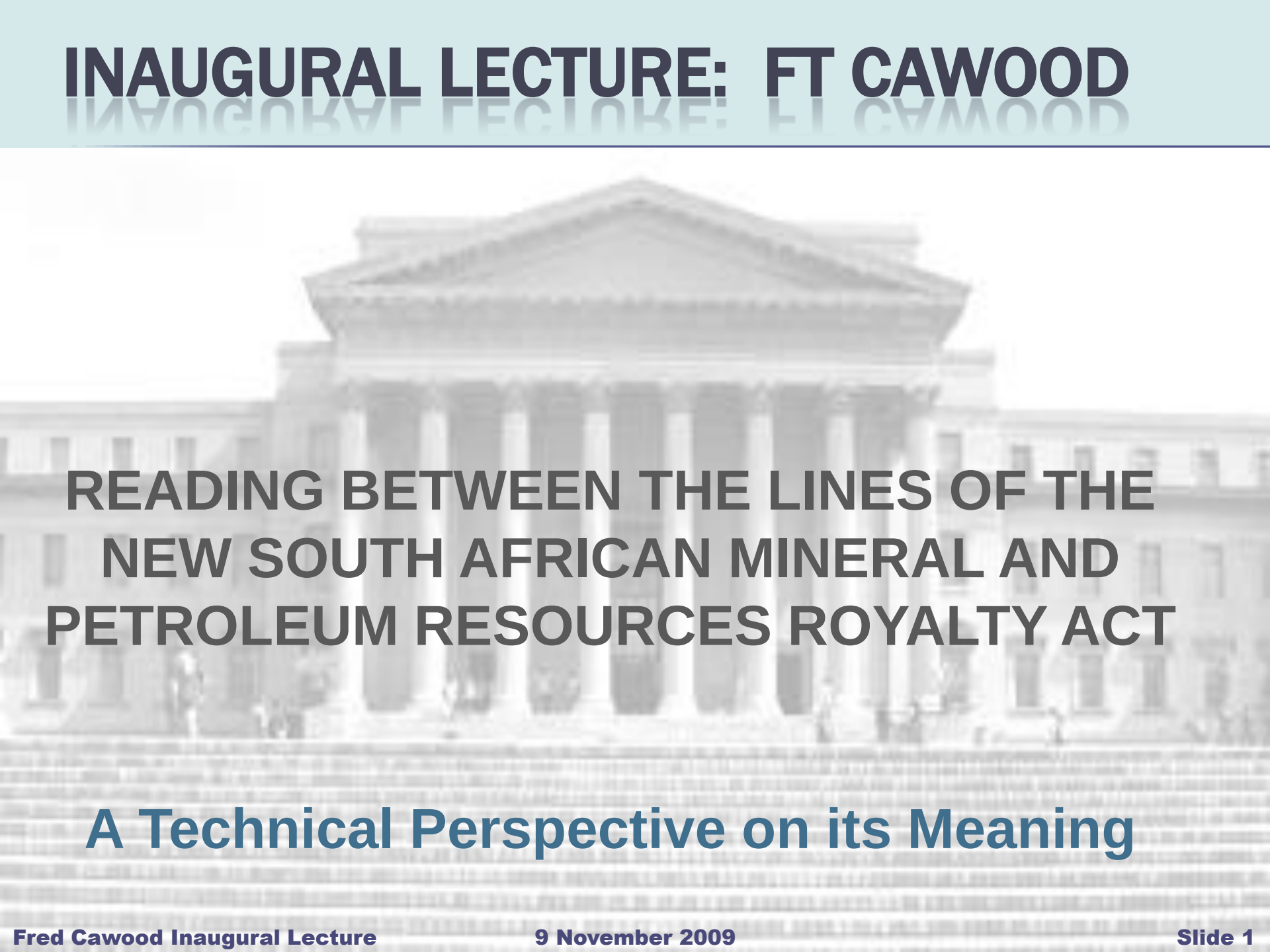


INAUGURAL LECTURE: FT CAWOOD

A faded, grayscale background image of a large, classical building with a prominent portico supported by many columns. The building appears to be a government or institutional structure, possibly the Union Buildings in Pretoria, South Africa. The image is slightly out of focus, serving as a backdrop for the text.

READING BETWEEN THE LINES OF THE NEW SOUTH AFRICAN MINERAL AND PETROLEUM RESOURCES ROYALTY ACT

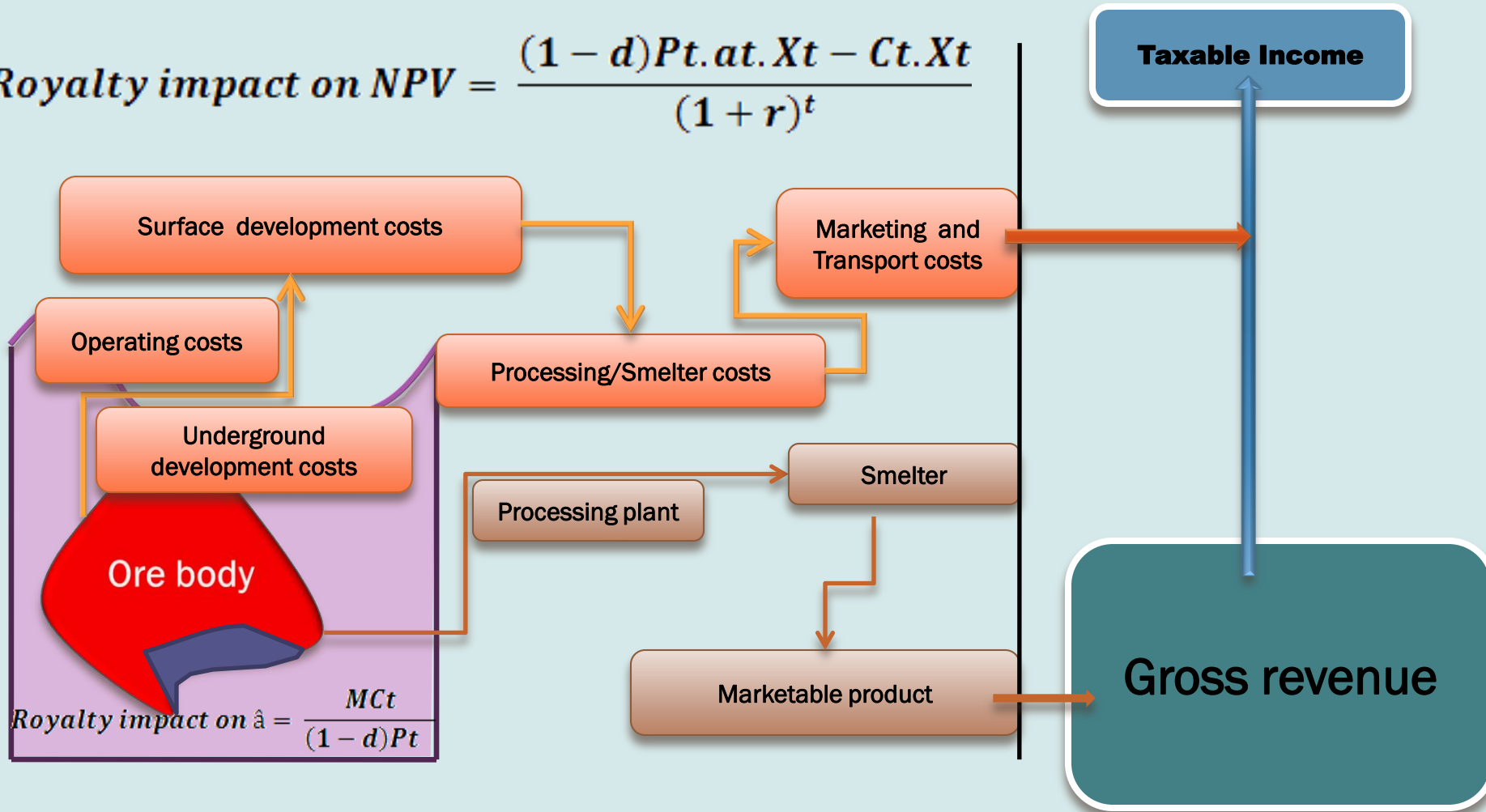
A Technical Perspective on its Meaning

Structure

- ✗ Theory of mineral royalties
- ✗ The past system of royalties in South Africa
- ✗ A royalty formula is more appropriate in pursuit of rents
- ✗ The Formula proposed by Cawood in 1999
- ✗ Main Royalty Act provisions and impact on reporting
- ✗ What does the Royalty Act mean to the State?
- ✗ What does the Royalty Act mean to the industry?
- ✗ How does it measure up against economic standards?
- ✗ Will the Act achieve value-addition?
- ✗ Opinion on the Royalty Act

Converting natural wealth into capital

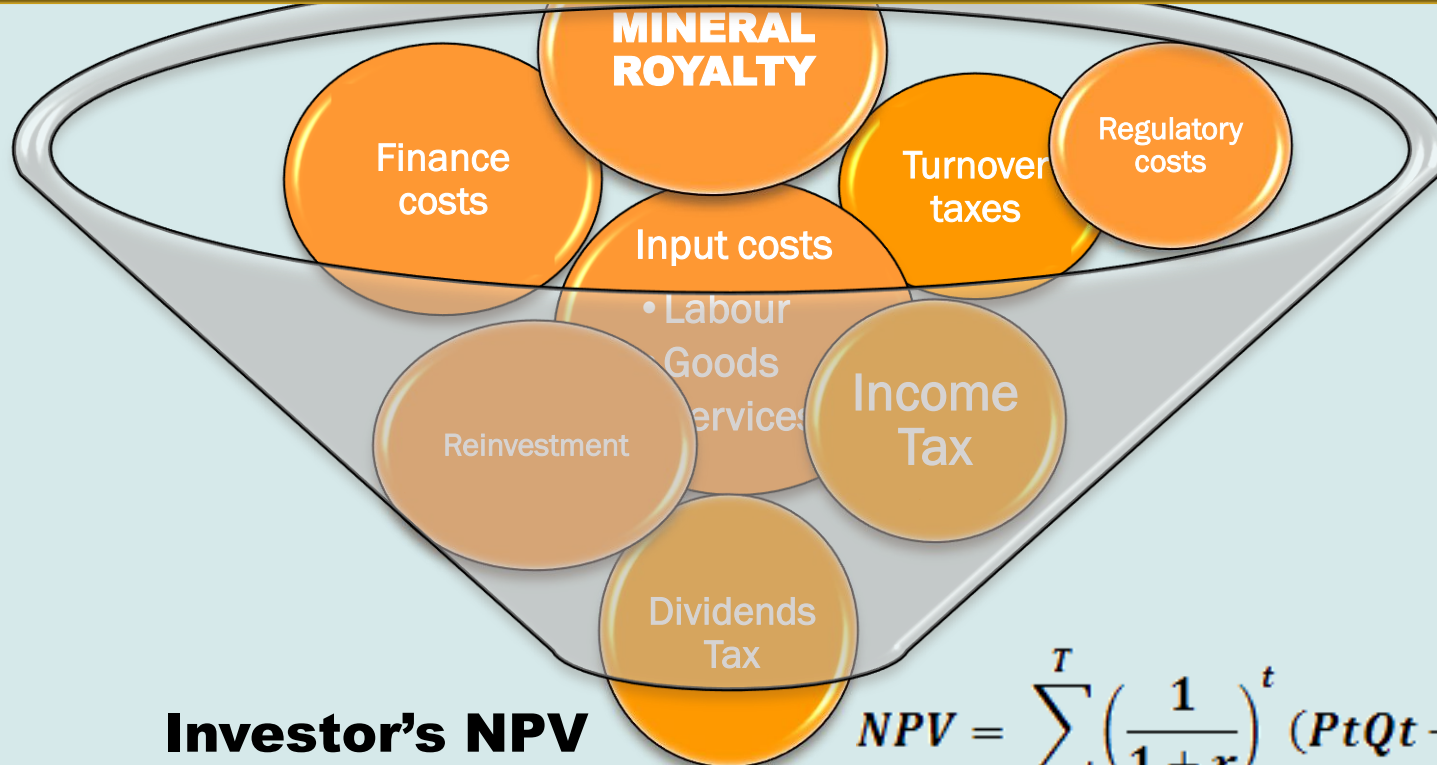
$$\text{Royalty impact on NPV} = \frac{(1 - d)Pt.at.Xt - Ct.Xt}{(1 + r)^t}$$



Ore body



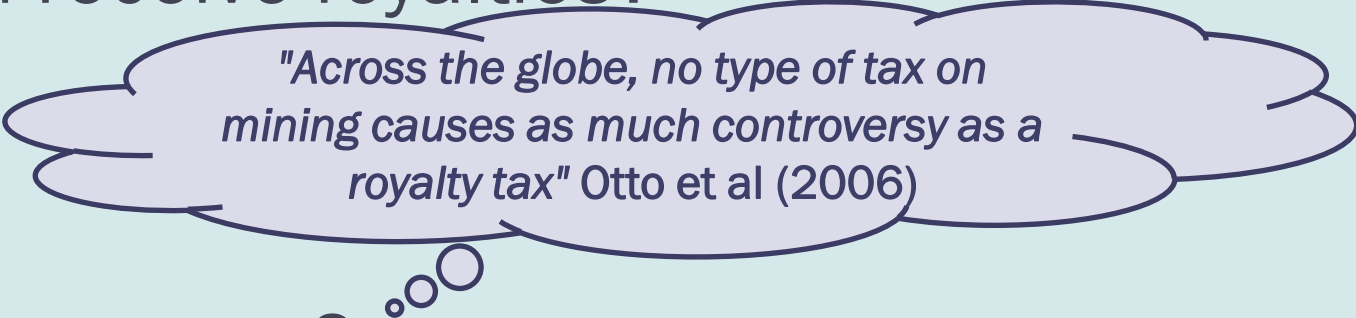
Converting ore body into a valuable product, which is exchanged for cash



$$NPV = \sum_{t=0}^T \left(\frac{1}{1+r} \right)^t (P_t Q_t - C_t Q_t - K_t)$$

Theory of mineral royalties

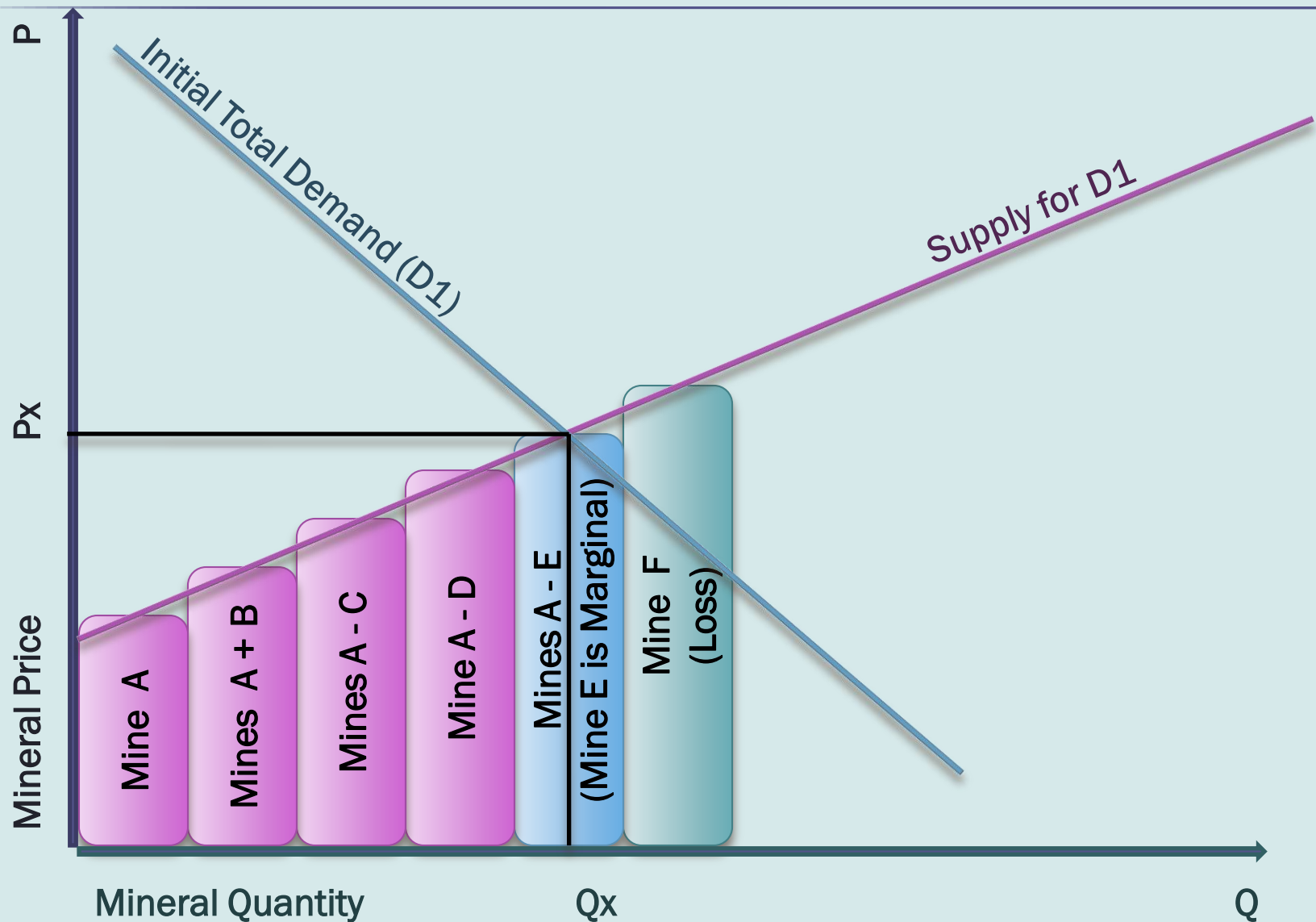
- ✗ What are mineral royalties?
- ✗ Who should receive royalties?



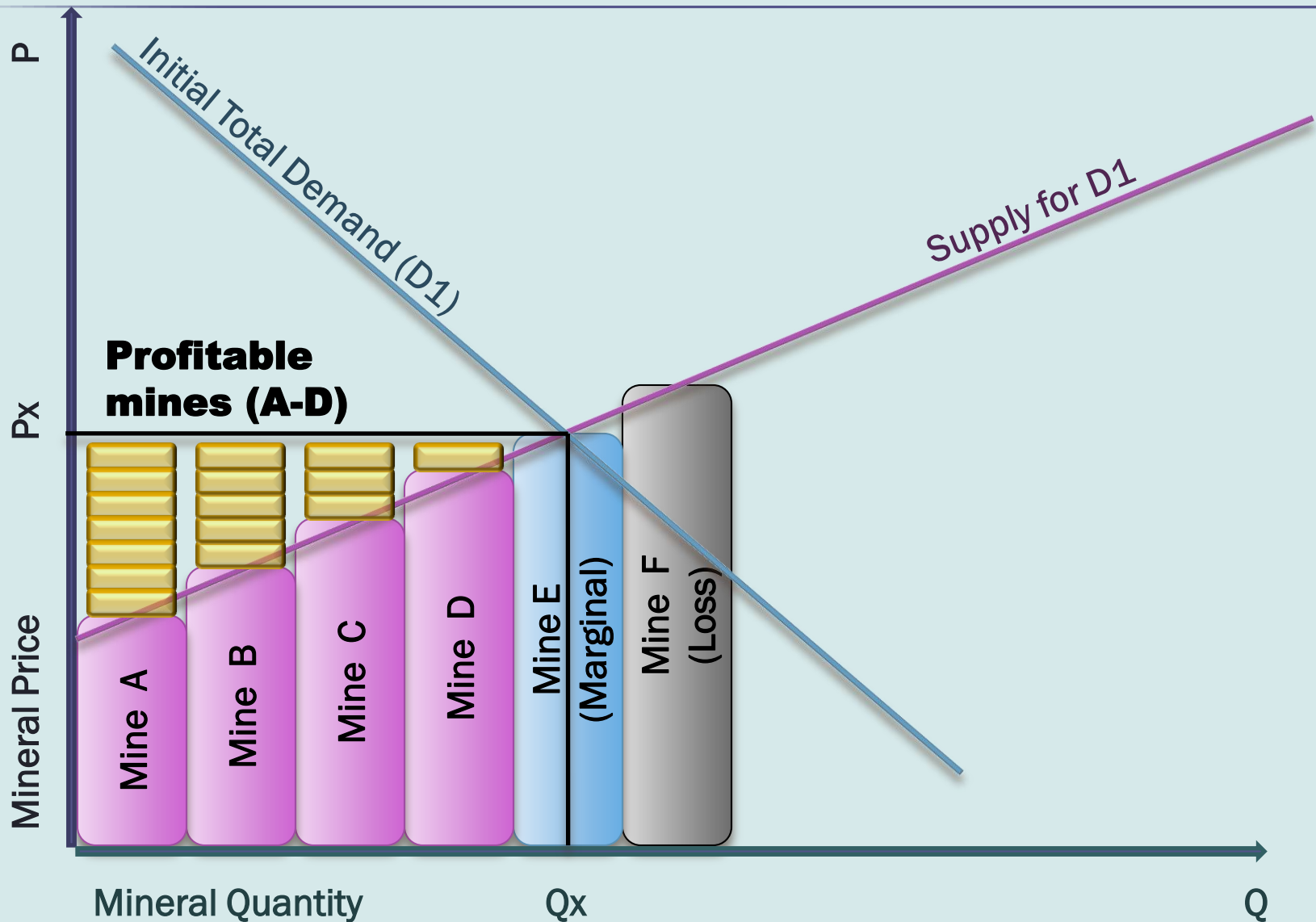
"Across the globe, no type of tax on mining causes as much controversy as a royalty tax" Otto et al (2006)

- ✗ Why the controversy?
- ✗ What are the design considerations?
- ✗ What are the options?
- ✗ What are the alternatives?

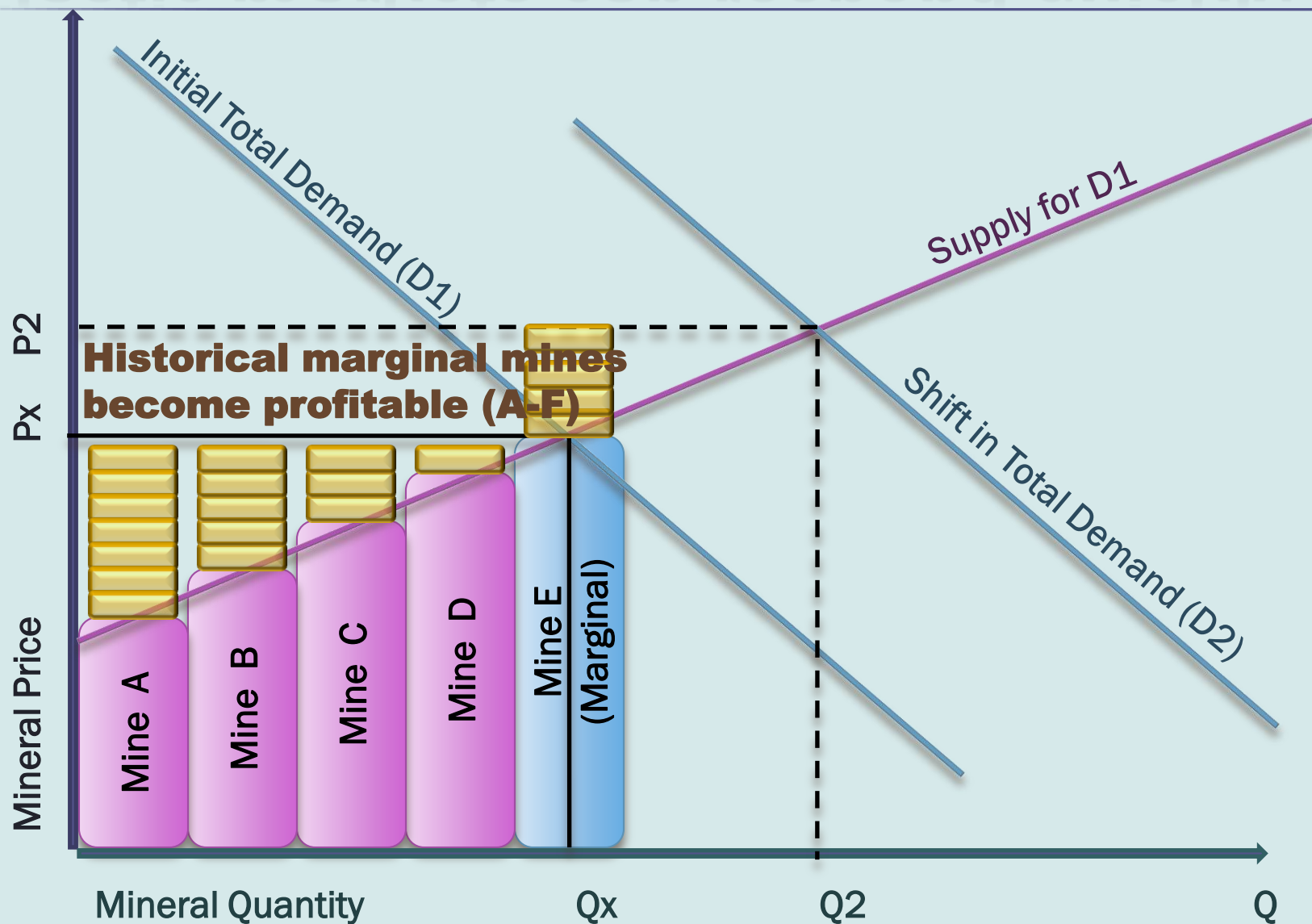
Understanding mineral rents



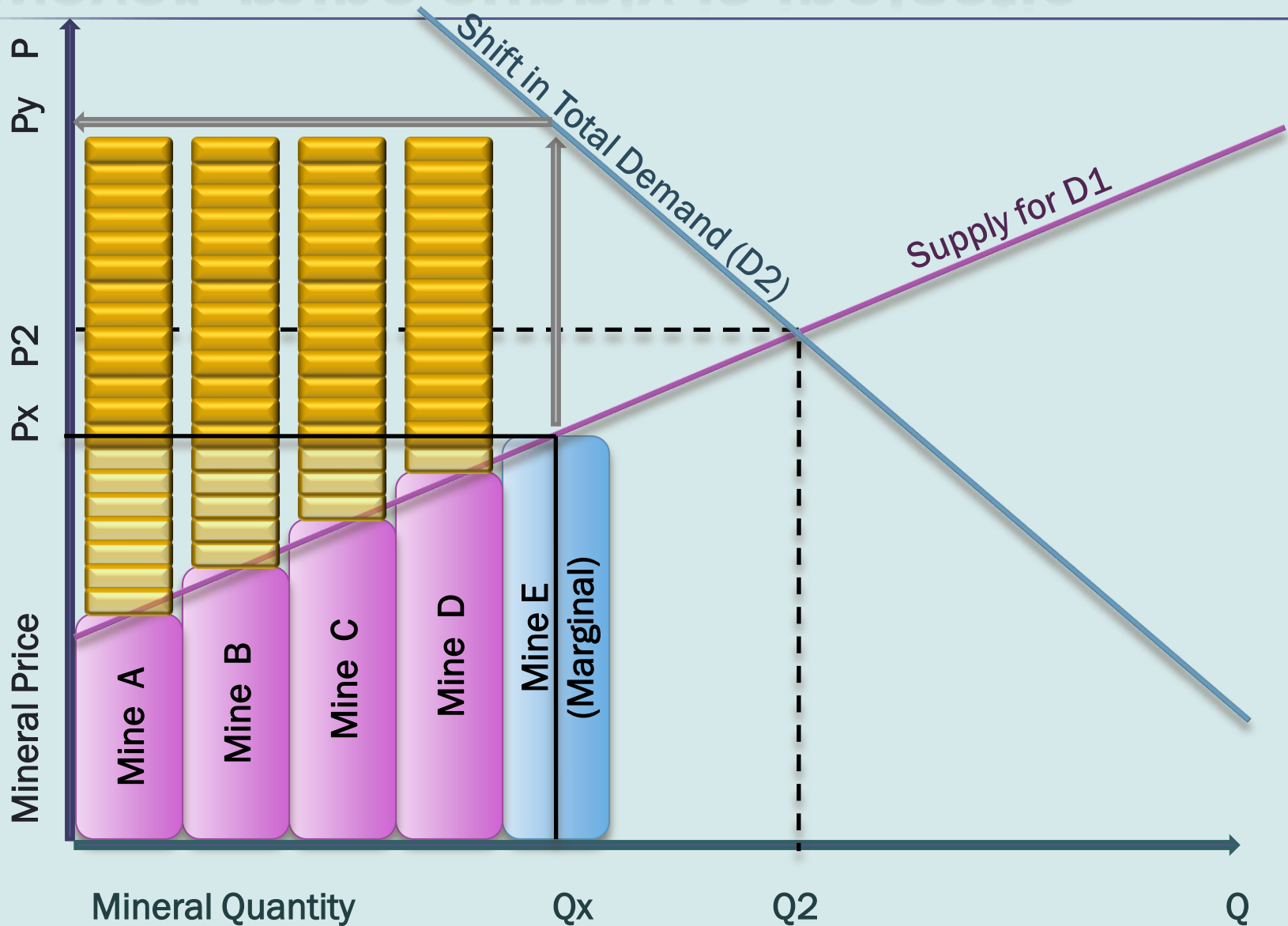
Not all mines are equal



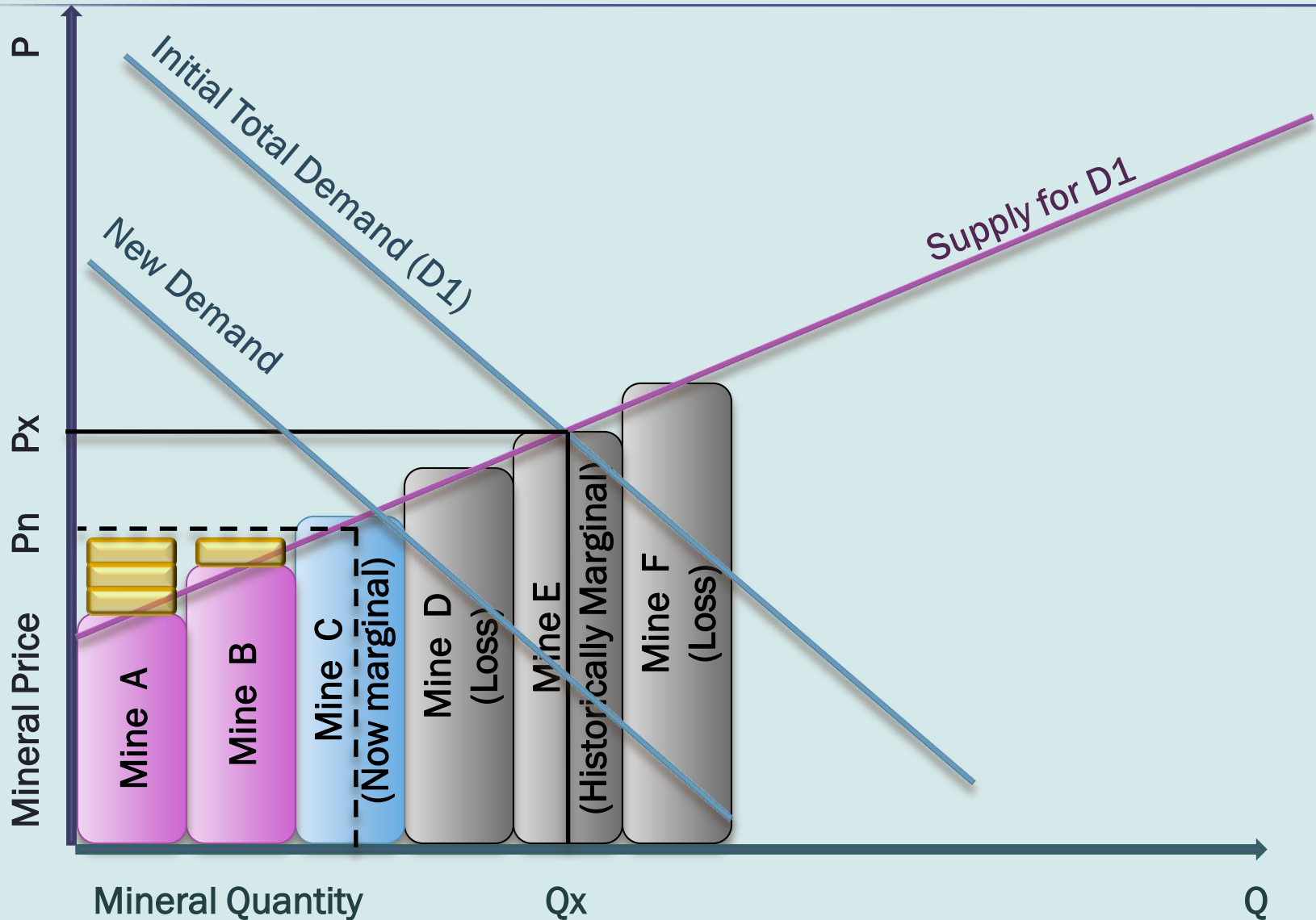
Elastic markets can respond quickly



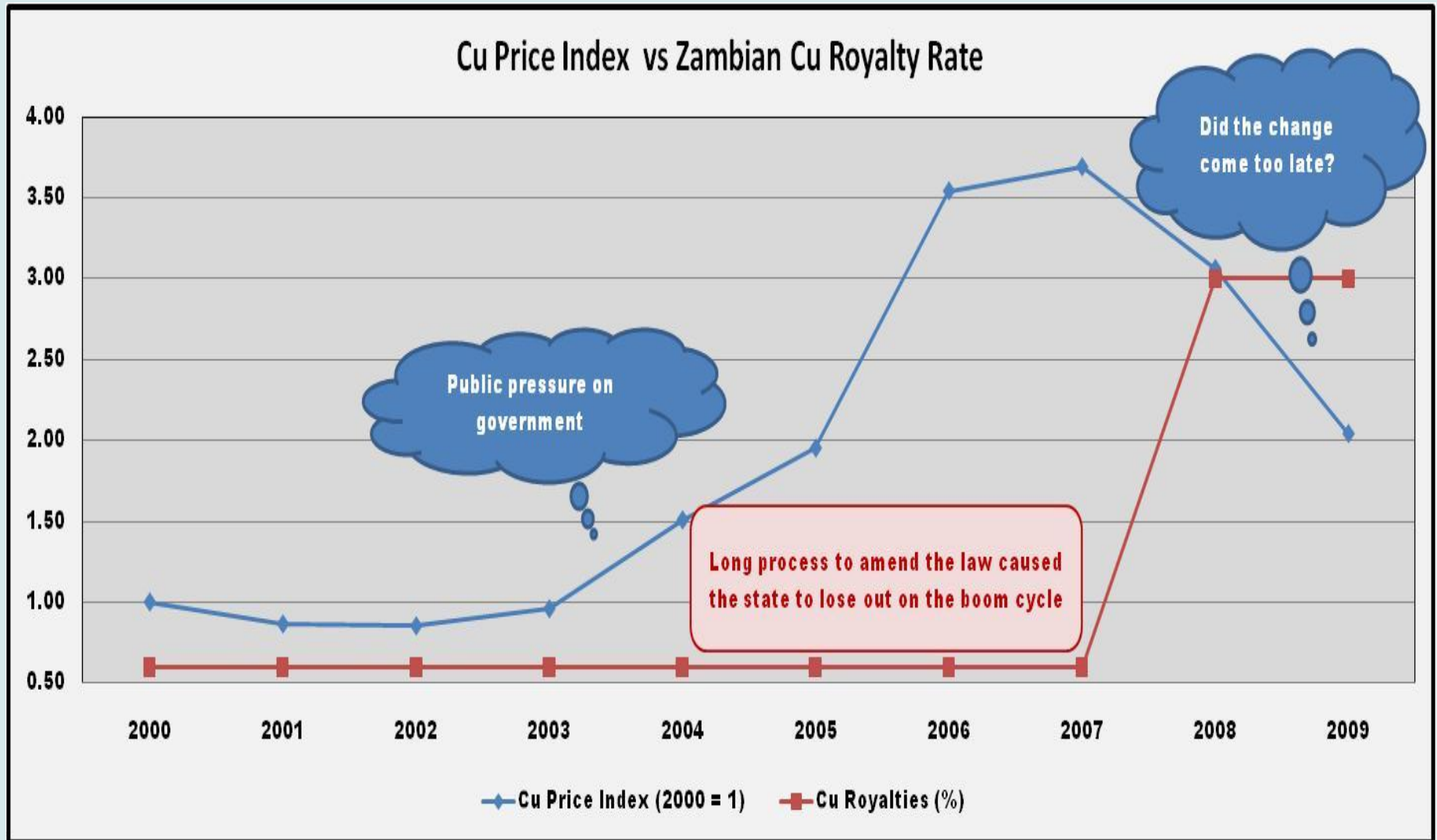
However, mine supply is inelastic...



But ... rents can just as easily evaporate



A case for royalties targeting rents



Historic mineral royalties in SA

- ✖ Before 1900: 1 – 2.5% of sales value
- ✖ Early 1900s: (Gold) lease consideration
- ✖ Late 1900s: Multiple schemes (negotiable)
- ✖ MPRDA (2002): State custodianship over minerals
- ✖ 2003/6 Royalty Bills: Specific rates on gross sales
- ✖ 2007 Royalty Bill: Formula based on NSR
- ✖ 2008 Royalty Bill: Dual formula on gross sales

Principles of Formula - Cawood (1999)

- ✗ A formula is appropriate if we are after rents
- ✗ 1st step– Fix the royalty base (NSR proposed)
- ✗ 2nd step - Fix the minimum rate (a) e.g. 1%
- ✗ 3rd step - Fix the maximum rate (a+b) e.g. 3%
- ✗ 4th step– Use profitability (PBT) to ‘slide’ the rate between (a) and (a+b) e.g. x-factor of gold formula
- ✗ Then (b) = rent premium, i.e. max 2% in example
- ✗ $Y\% = (a+b)$ is the royalty rate

Structure of the Formula

- ✖ $Y\% = (a+b)$, where $b = \frac{X - \text{Ratio in current year}}{\text{Factor to achieve the maximum rate}}$
- ✖ x-ratio = PBT ÷ Sales revenue over the period
- ✖ Factor (F) based on principle that max profitability (100%) results in max rate (e.g. 3%)
- ✖ Solving for F in Formula $3 = 1 + \frac{100}{F}$, i.e. $F = 50$
- ✖ For a rate between 1 and 3%, $Y\% = 1 + \frac{x\%}{50}$
- ✖ For a rate between 1 and 5%, $Y\% = 1 + \frac{x\%}{25}$

The intent of the Formula

Table 1 Sliding rate caused by the parameters of the formula

Profitability or x-ratio	$Y\% = 1 + \frac{X}{50}$	$Y\% = 1 + \frac{X}{25}$	Remarks
0 %	1 %	1 %	Minimum rate
25%	1.5 %	2 %	
50%	2%	3 %	
100%	3%	5 %	Maximum rate

Principles of the Royalty Act Formulae

- ✖ The two formulae target rents
- ✖ A royalty base of gross sales
- ✖ The minimum rate in both formulae = 0.5%
- ✖ The maximum rates (a+b) are 5 and 7%
- ✖ EBIT '*slide*' the rate between (a) and (a+b)
- ✖ The maximum rent premium (b) = 4.5 & 6.5%
- ✖ $Y\% = (a+b)$ as per Cawood's Formula

Main features of the basic royalty scheme

- ✖ One of two formulae used to calculate the rate
- ✖ Choice requires an assessment on refinement
- ✖ Both are payable on a base of gross sales

- ✖ Refined rate

$$Y_r \% = 0.5 + x/12.5$$

- ✖ Unrefined rate

$$Y_u \% = 0.5 + x/9.0$$

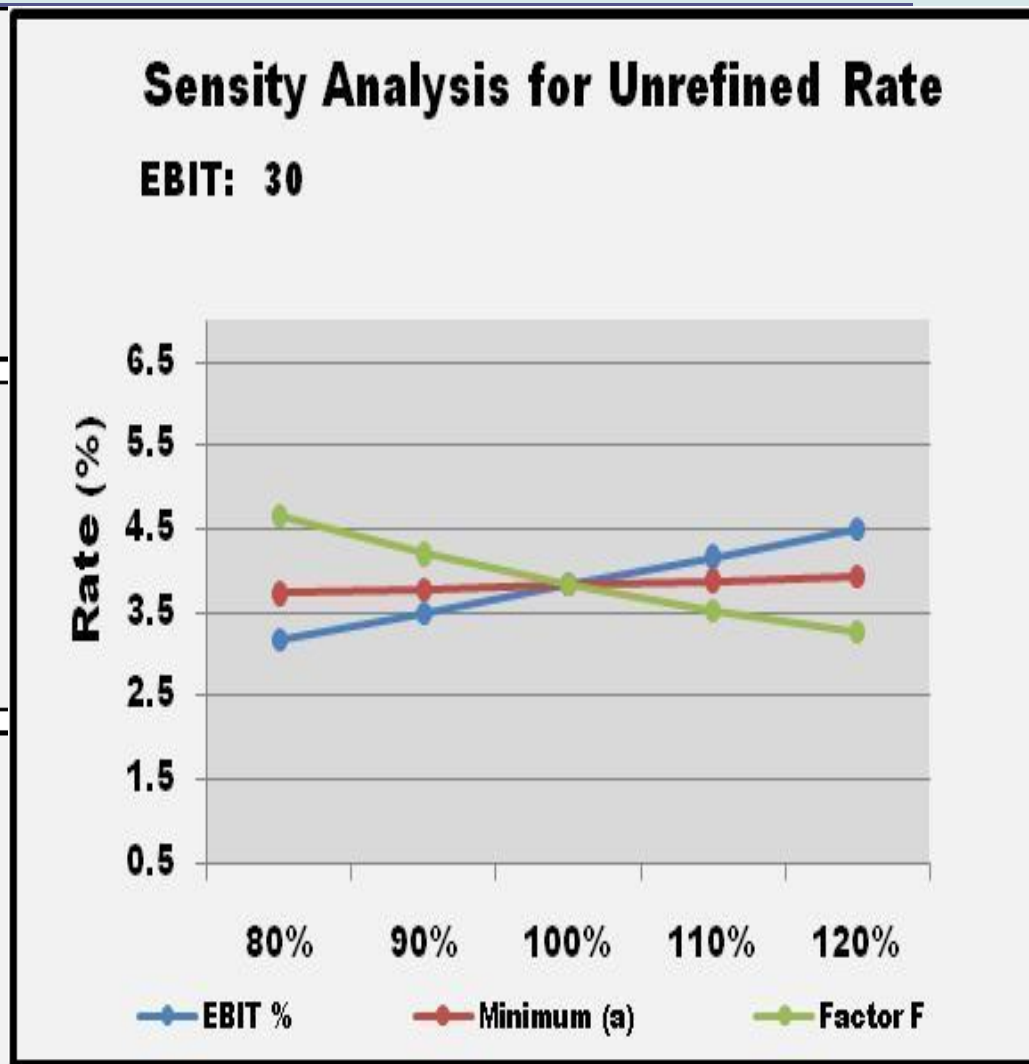
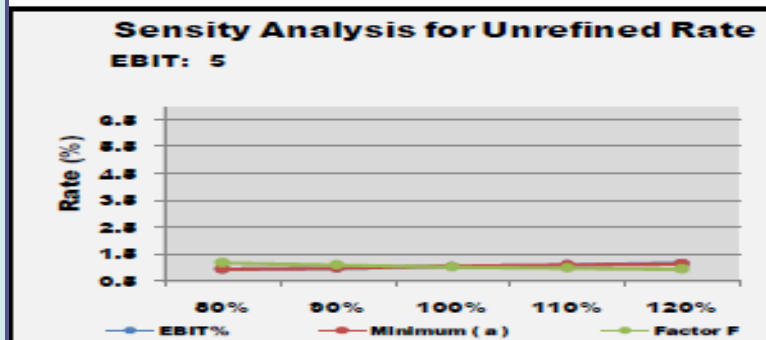
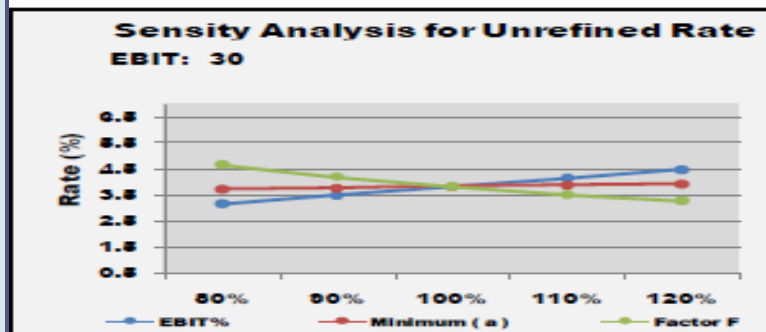
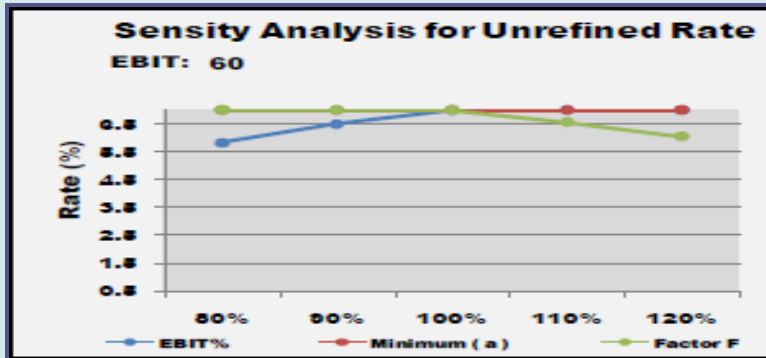
- ✖ The refined rate is reduced by F to

compensate for the additional cost of refinement

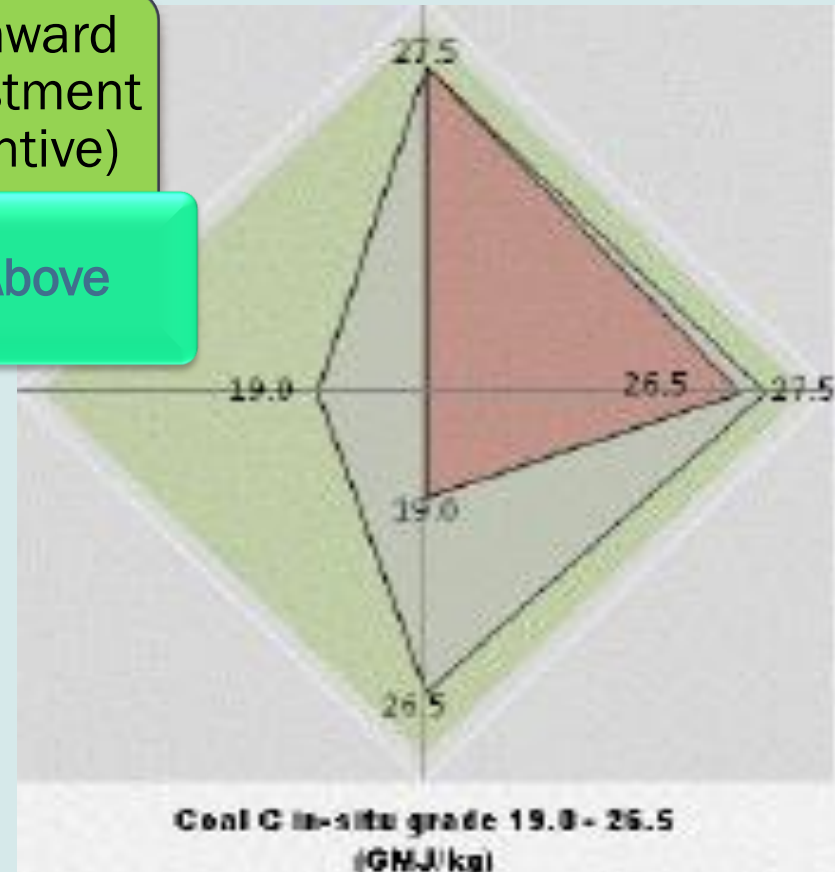
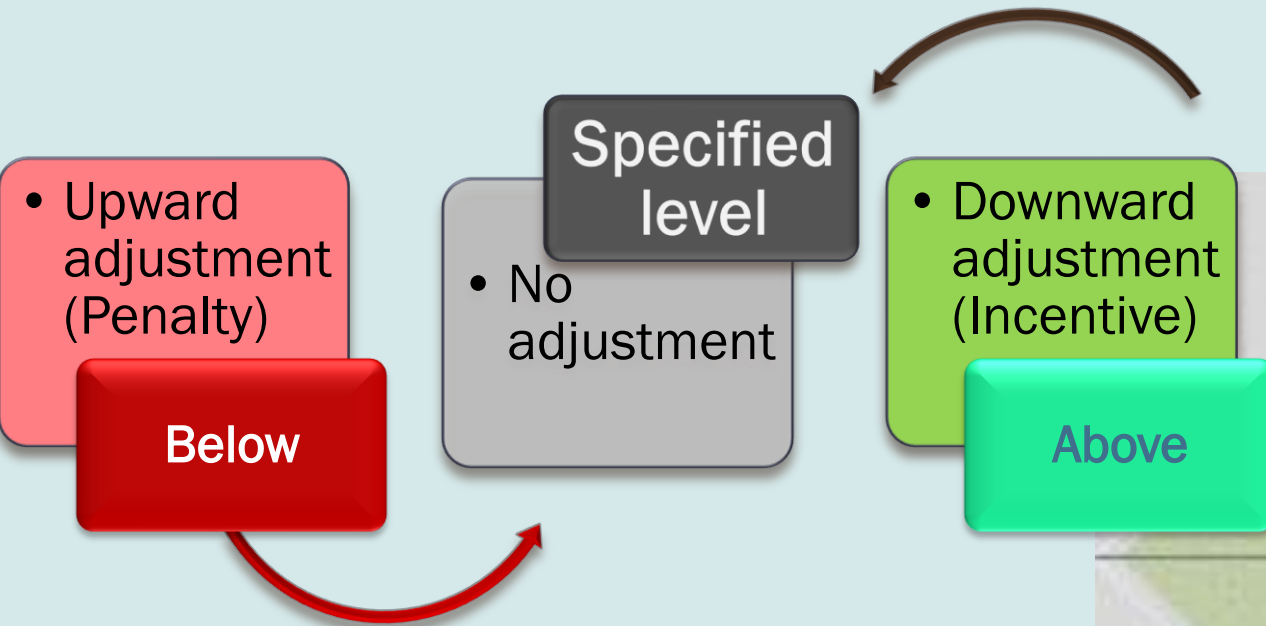
SLIDING-SCALE RATE CALCULATION (ROYALTY AND GOLD FORMULA)					
Profitability (%)	Gold Lease Rate (y = 15 - 90/x)	Gold Tax Rate (y = 43 - 215/x)	The Formula (y = 1 + x%/50)	Unrefined Royalty (%)	Refined Royalty (%)
-10	0.0	0.0	0.8	0.5	0.5
0	0.0	0.0	1.0	0.5	0.5
5	0.0	0.0	1.1	1.1	0.9
10	6.0	21.5	1.2	1.6	1.3
20	10.5	32.3	1.4	2.7	2.1
30	12.0	35.8	1.6	3.8	2.9
40	12.8	37.6	1.8	4.9	3.7
50	13.2	38.7	2.0	6.1	4.5
60	13.5	39.4	2.2	7.0	5.0
Average	7.6	22.8	1.5	3.1	2.4

An issue to watch out for

- × Impact varies under different EBITs



A second issue to watch out for



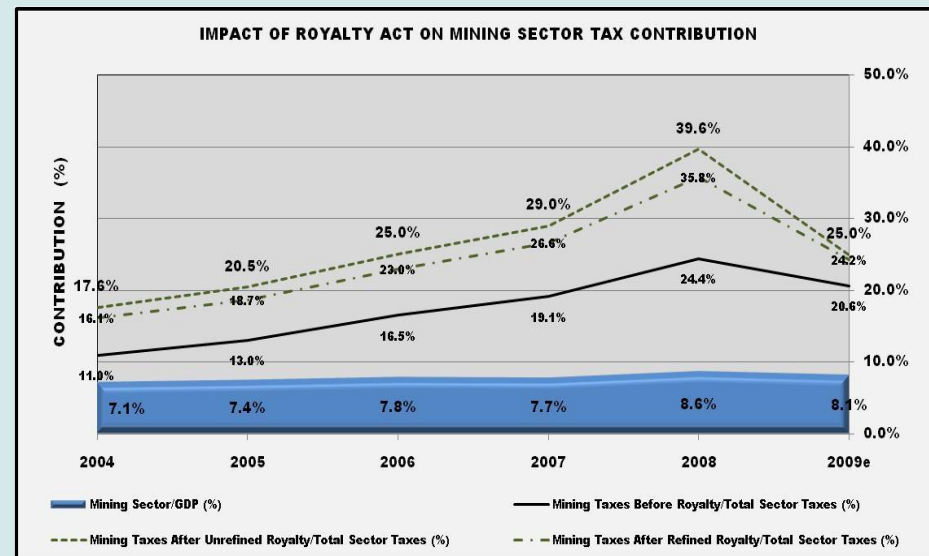
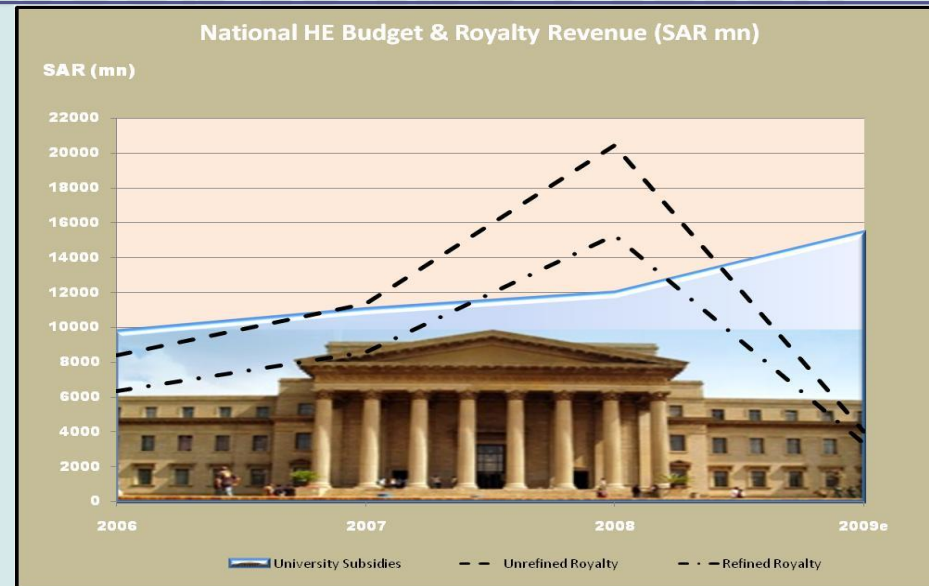
× Gross sales adjustments

What is the impact on reporting?

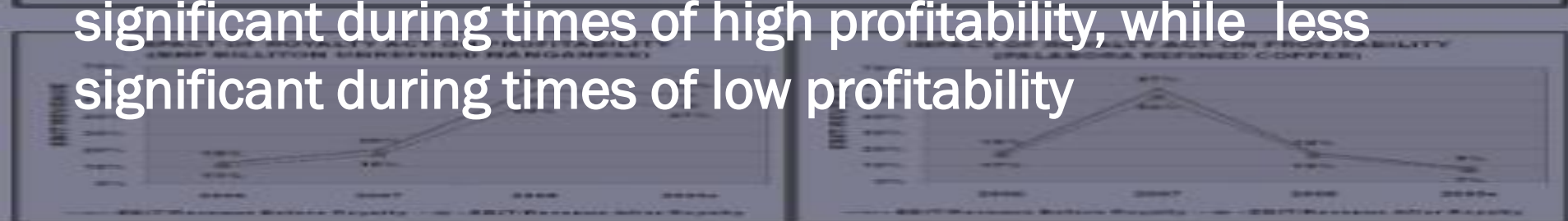
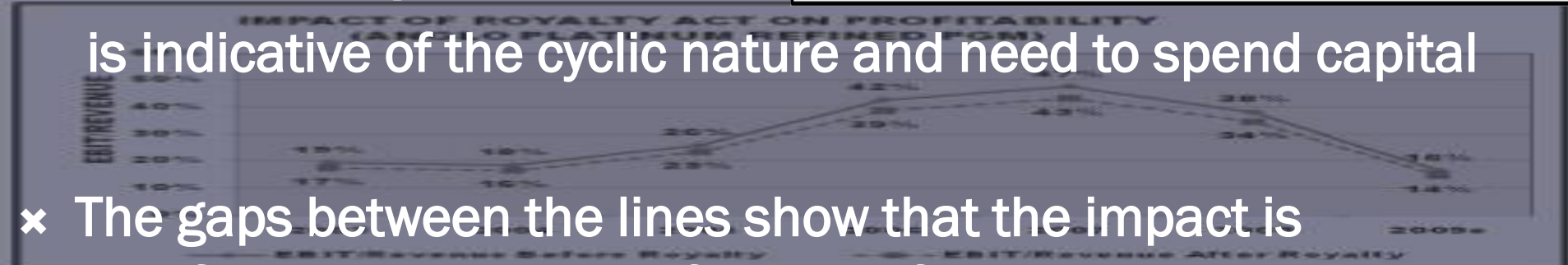
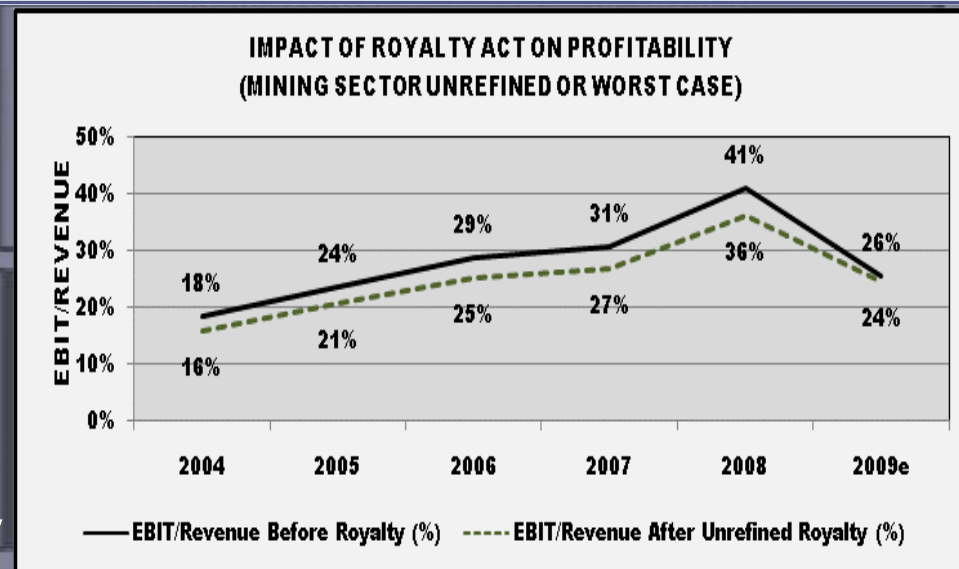
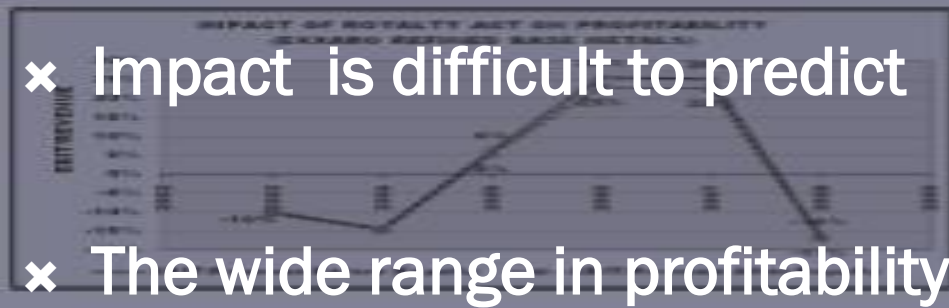
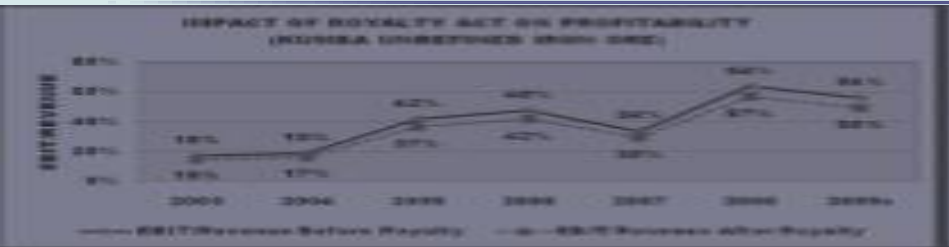
- ✘ Technical sign-off(s) on the quantity and quality for the range of mineral products e.g. coal mines
- ✘ Technical and accounting input to the adjustments to revenue for products outside the specified conditions
- ✘ Mine-specific definitions and methods for calculating gross sales, EBIT and the royalty amount
- ✘ Adjustment of transfer pricing protocols for valuation of non-arm's-length gross sales values
- ✘ Auditor's alignment of the royalty parameters with financial reporting standards

What does the Act mean to the State?

- ✗ Mineral and petroleum taxes account for about 15% of total corporate taxes
- ✗ The Act would have generated sufficient income in 2008 to cover the national university budget
- ✗ Expect about a 7% rise in mining's contribution to company taxes and a 50% rise in the tax bill in good years
- ✗ Mining will play an even bigger part in the national economy of future South Africa

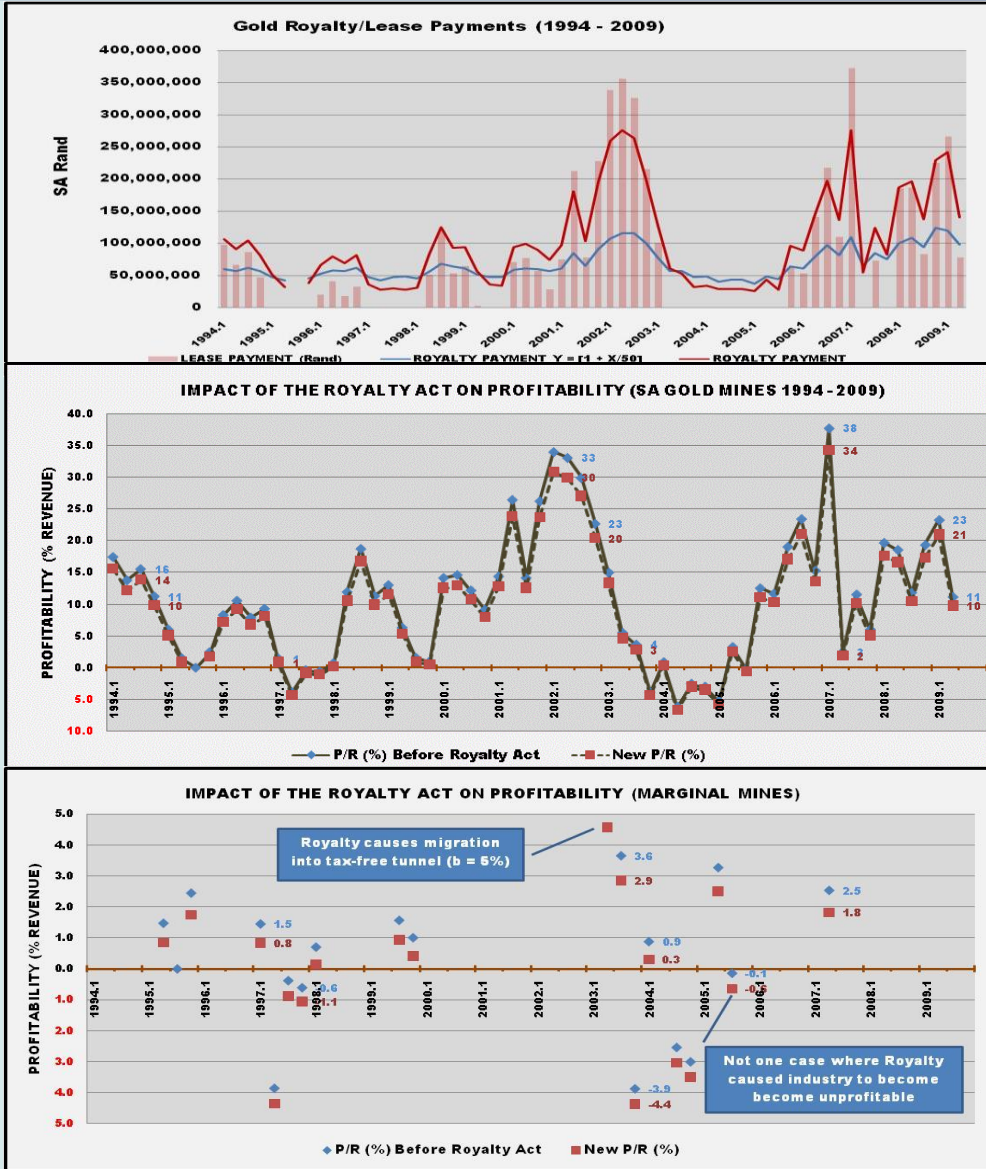


What does the Act mean to Industry?



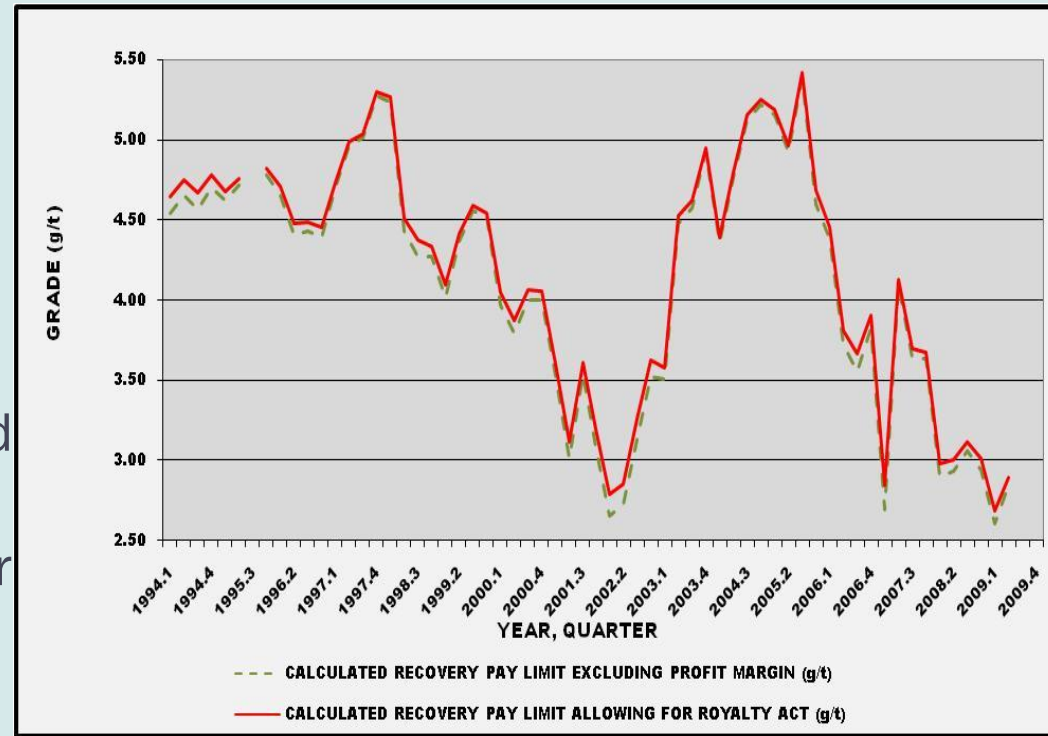
Major sponsor of the gold industry

- ✗ COM quarterlies : Lease formula efficient during market upswings, but no income during bad times
- ✗ Profitability ratios ranged from minus 6% to plus 38%
- ✗ The royalty rate moves with market cycles (average rate 1.41%)
- ✗ Impact of royalty significant during times of high profitability, while less significant during low profitability
- ✗ Not once over the 15-year period the royalty caused a positive ratio to become negative over a quarter
- ✗ One example: Profit ratio dropped below the 5% margin (income tax rate then becomes zero)
- ✗ More research required on impact on individual mines



Royalty impact on gold mine pay limits

- ✗ Rise in PL of 0.06 g/t
- ✗ Appears insignificant but sterilized 72t of gold
- ✗ Reserve reduction of (only) 1.4%, but value is R6.6bn
- ✗ 18.8mn tonnes to be removed from reserve statement
- ✗ If 370t milled = 1 mine worker 50 897, would not have had a job (3 393 jobs pa)
- ✗ It is only 0.7% of total employment in mining, but sell it to their families
- ✗ Also questionable because the R6.6bn loss in reserves is preferred above R6.2billion royalty revenue - a net loss of R0.4bn
- ✗ Further analysis of low grade gold mines is required to fully understand the full impact (must include socio-economic study)

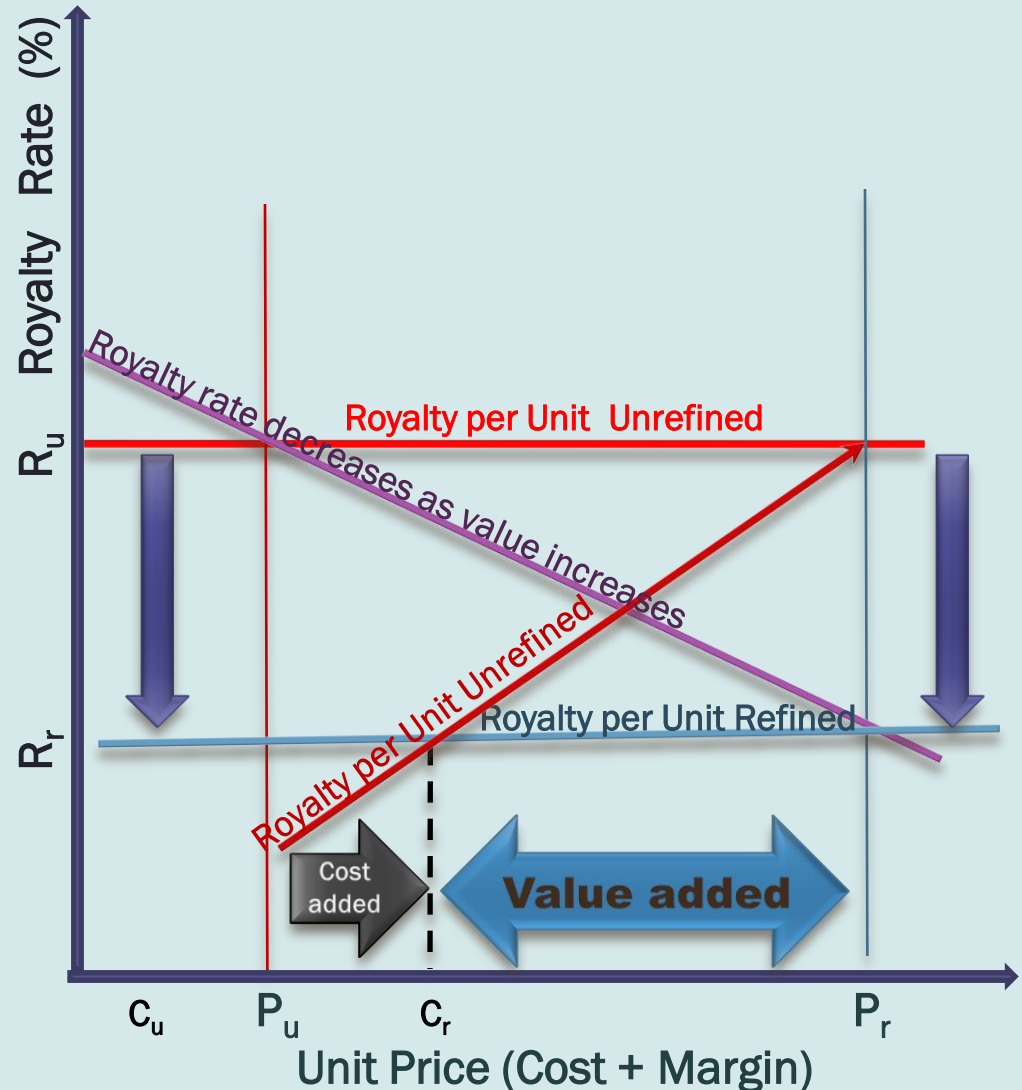


How does it measure up?

Criterion	Finding	Comment
Efficiency	✓	Some distortion of EBIT. It appears to be minimal - even for marginal and loss-making mines
Neutrality	×	The royalty base is gross sales, which could be further adjusted to meet minimum specified requirements
Equity	✓	Equitable allocation of royalty burden among mineral types, in addition to relief measures
Stability	✓	Provision for formula (no need for regular rate adjustments) and FSA (for extraordinary projects)
Clarity	?	Difficult to judge – Base and rate clear and set in law, but compliance costs could be unnecessarily high
Sustainability	✓	Provision for exemption during prospecting, relief to marginal and small mines and system of credits

Royalty rates and value-addition

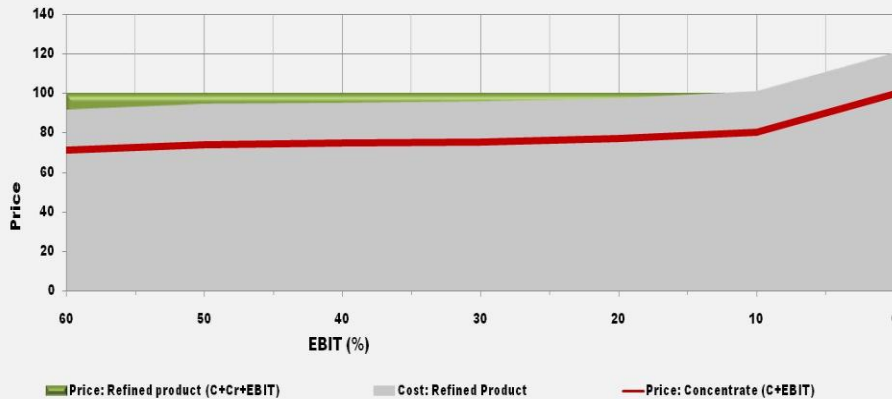
- ✗ Targets mine-head price for gross sales royalties
- ✗ Negative relationship : Royalty rate and Unit price (purple line)
- ✗ C_r is justified when there is value added
- ✗ Goal is achieved when R_u shifts down to R_r (blue arrow)
- ✗ R_r now gives same State revenue as a R_u ($R_r 2.5\% = R_u 10\%$)



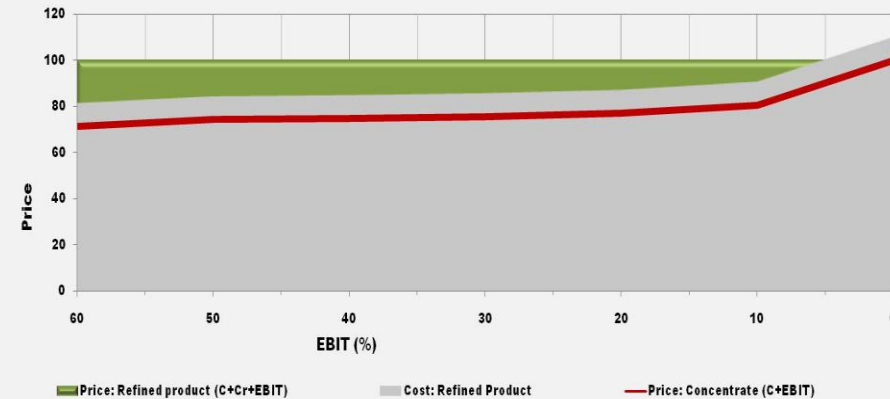
Bradley (1986)

Applying Bradley's scheme to SA

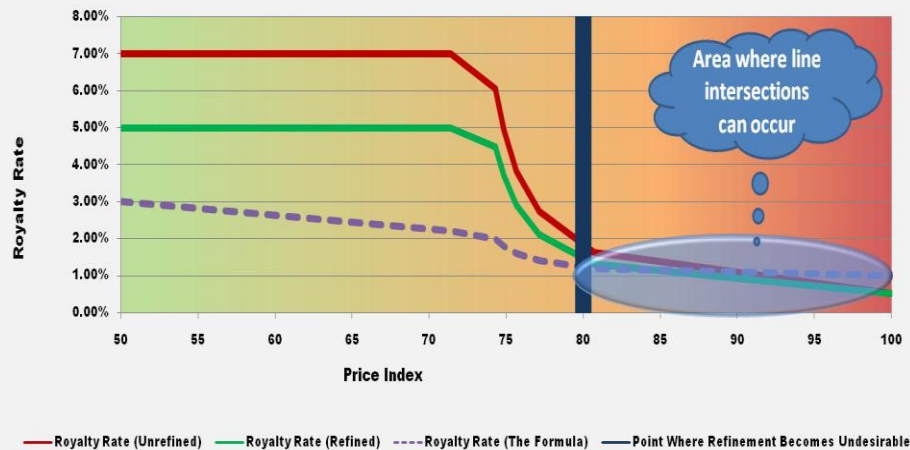
Value-added for refinement cost (Cr) of 20 % for a mine producing concentrate at cost (C+EBIT)



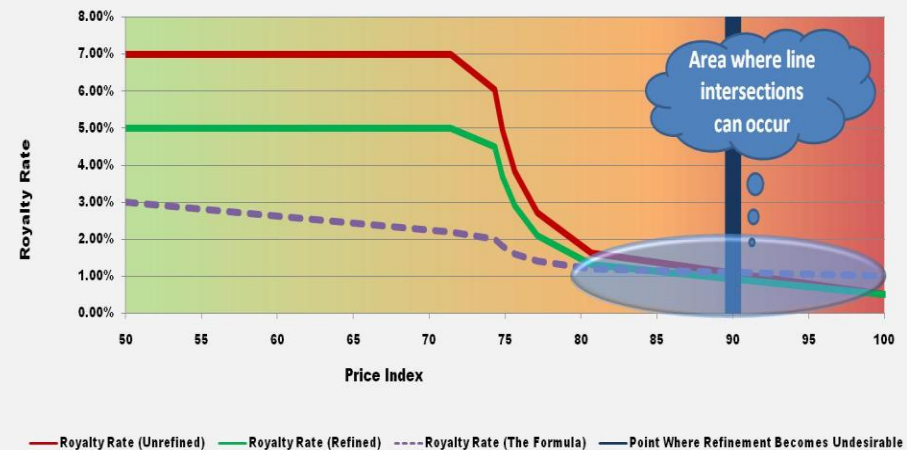
Value-added for refinement cost (Cr) of 10 % for a mine producing concentrate at cost (C+EBIT)



Point at which the total cost (C+Cr+EBIT) does not add value, i.e. unrefined formula is better
(Cost must be less than 80 % of price)



Point at which the total cost (C+Cr+EBIT) does not add value, i.e. unrefined formula is better
(Cost must be less than 90 % of price)



Will it achieve value-addition?

- ✗ When refinements costs are more than 20% of the sales price, very little value added is achieved
- ✗ When refinements costs are 10% of the sales price, costs are probably justified
- ✗ **However**, inability to engineer a clear intersection is problematic for the investment decision
- ✗ **Therefore**, the carrot will probably not lure miners to spend the additional capital to become refiners
- ✗ It would perhaps be more effective to have one formula and allow Cr to be deducted from sales revenue **or** to increase Factor F in refined formula so that the maximum rate is significantly reduced

An independent opinion

- ✗ Mineral royalties are unavoidable
- ✗ The Act is based on sound principles
- ✗ A formula targeting rents is appropriate
- ✗ Political pressure caused Act to become too complex
- ✗ State will receive its fair share (perhaps more)
- ✗ Industry can afford the Act
- ✗ It measures up with most economic standards
- ✗ The dual rate is unlikely to encourage value-addition
- ✗ More research is required on individual mine impact

The future?

After considering the impact I believe that the new Act's requirement for information will make it possible to accurately define NSR over time. Once it is fully understood in the SA context the risk of revenue loss to the State will be reduced. The Act could then be amended so that:

1. The base drifts towards a NSR definition in order to target resource value; and
2. The dual formula structure is collapsed into a single formula similar to the refined formula.

THANK YOU – ANY QUESTIONS?

“The art of taxation consists in so plucking the goose as to obtain the largest amount of feathers with the least possible amount of hissing”

JB Colbert (1619 – 1790)