

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

A Technical Perspective on its Meaning

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ABSTRACT

After a prolonged process of drafting and consultation, the new mineral royalty regime for South Africa was signed into law in November 2008. The main purpose of the Act is to compensate the State as the custodian of South Africa's rich mineral heritage through a royalty charge to holders of mineral development rights from 1 March 2010. Deciding on an acceptable royalty is a complex process, especially when it targets deceptive economic rents. This is achieved with a variable royalty rate that slides in tandem with mine profitability. The base is sales revenue and to compensate for the need to charge for the mineral in its unprocessed form, refined production is charged at a lower rate. Only time will tell if the view expressed in this paper on the policy success, as measured by the motivation for current mineral producers to spend the additional capital to become refiners, is correct. The aims of this paper are to *first*, discuss the Act in the context of the underlying theory, *second*, establish the impact thereof, *third*, measure it against international tax standards and *fourth*, make an educated guess on the meaning of the Act. This paper argues that most investors will be comfortable with most of the requirements of the Act for most of the time.

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INTRODUCTION

After a five year process of consultation and intense debate that ended in 2008 and included the release of four Draft Royalty Bills, the Mineral and Petroleum Resources Royalty Act (Royalty Act, 2008) was finally promulgated in November 2008. The main purpose of the Royalty Act is to collect royalties from South African mines holding mining rights granted in terms of the Mineral and Petroleum Resources Development Act (MPRDA, 2002). The intention is to compensate the State for its custodianship over South Africa's non-renewable mineral resources when these are exploited by mining companies for their own benefit.

The principal concerns on the first two Draft Royalty Bills (2003, 2006) were insensitivity to the economic principle called *ability-to-pay* and mineral discrimination because there were high rates for some minerals while others were exempt from royalties². These problems were addressed in the third Draft Royalty Bill (2007) by the introduction of a formula which calculated the royalty rate. The formula applied uniformly to all minerals and comprised of a fluctuating rate as profitability moves with the cyclicity of the minerals sector. The earlier problem of not allowing costs associated with product value-addition to be deducted before applying the royalty rate, were also addressed by introducing a base that approximates Net Smelter Return (NSR)³. Another concern that remained throughout the process is the potential double royalties. Under the previous ownership system the mines often paid outright for the mineral rights through direct purchase, in which case the Royalty Act would effectively levy a second royalty over the same resource. This issue of double royalties becomes especially problematic when communities are involved⁴. The National Treasury (2007) had its own concerns during the

² This approach incorrectly assumes uniqueness is determined by commodity type. It disregards the fact that uniqueness is a function of market price and cost of delivery to the market.

³ NSR is calculated as sales revenue minus transport and beneficiation costs. The final and fourth Draft moved away from a NSR-base and opted for a dual formula system depending on the classification of mineral production as either refined or unrefined.

⁴ This is because of an MPRDA provision that community royalties must continue in the new order.

drafting process and identified equity, promotion of value-addition, liability shifting, marginal mine relief, royalty rate guarantee, transfer pricing, earmarking of revenue, community royalties, and administrative matters as the major issues.

This article starts with the theory of mineral royalties. It explores issues such as who should get royalties and for what reasons. The different types of royalties that are encountered internationally and the attitude of international investors towards royalties are also considered. This theoretical perspective is followed by how mineral royalties were historically applied in South Africa. The historic regime over State-owned mineral rights allowed for site-specific royalties to be negotiated with the Department of Minerals and Energy (DME) on an *ad-hoc* basis. The past system also had inadequate controls for effective governance during the calculation, declaration and collection of royalty payments by the State. It is followed by a summary of previous research conducted by the author in an attempt to develop an appropriate scheme for collecting royalties in South Africa (Cawood, 1999). The article then offers a brief overview of the main features of the new Royalty Act and an explanation of the royalty calculation in the context of the original research. Possibly the most important section of this article is the author's interpretation of what the Royalty Act means to the South African government and the mining industry. Such analysis is then followed by an objective attempt to measure the Royalty Act using accepted economic standards as applied to mineral royalties and its policy objectives on beneficiation. The article ends with an independent opinion on the Royalty Act.

THE THEORY OF MINERAL ROYALTIES

As one of the oldest forms of taxation, the theory of and literature on mineral royalties are extensive. The current era is characteristic of States being eager to extract more benefits from their natural resources and has caused renewed interest in how mineral royalties could be redesigned to target a portion of mineral rents. This search for benefits resulted in some fundamental questions being asked, which will be attended to in this section.

What are mineral royalties?

The theory of mineral royalties, as one of the most effective mining taxes since the earliest days of mining, developed from agricultural rent⁵ payments. The principle that fertile land is worth more than unproductive land fits the unique nature of mineral deposits. Mineral royalties also give effect to the established international law principle of National Sovereignty over Natural Resources (NSONR) and it is in this context that Otto et al. (2006) defined a royalty as *"...payment due to the sovereign owner in exchange for the right to extract the mineral substance..."*. Demonstration of NSONR internationally has prompted governments to own the mineral rights within their territories, incorporate royalties into their fiscal regimes; align their use with socio-economic programmes; and to link it with security of tenure – all in an attempt to optimise the benefits that arise from the development of mineral resources. Mining royalties represent the quantum due to the nation upon depletion of a non-renewable resource. There is therefore pressure to set the quantum so that it reflects the risk-reward nature of the industry and is fair to both owner and user. Mineral development therefore allows mining companies the opportunity to benefit in an extraordinary fashion, while it also allows the public to share in the associated economic rents⁶.

Who should receive royalties?

Mineral royalties is that royalties are meant as compensation for the mineral rights owner's permission to a mining company so that such company can lawfully mine and remove minerals for its own account from the land in which these minerals naturally occur. International law developed in a direction where the sovereign is entitled to receive the royalties on behalf of the public. In the minds of the public, a mineral royalty is symbolic of NSONR and is the

⁵ This is based on the writings of Ricardo (1821).

⁶ Rent is earned when the user earns returns over and above what was initially expected. From the owner's perspective all rents can be taxed away without influencing the investment decision because the bonus is as a direct result of resource the characteristics. The company's perspective is that entrepreneurship optimises return and without it there could be no rents at all.

policy instrument aimed at compensating the public for the depletion of their mineral resources. The problem is which level of government should receive it, which could be national, provincial or local (community) level⁷. After a process of intense debate it was decided that national level is the most appropriate level for South Africa. However, the MPRDA makes provision for a second layer of royalties by giving (traditional) communities an entitlement to also receive royalties, causing a double payment for essentially the same thing.

Why the controversy?

Otto et al (2006) observed that *"across the globe, no type of tax on mining causes as much controversy as a royalty tax"* In order to understand why royalties cause controversy, one must consider the relationship between royalties and economic rents. Mineral production transforms non-renewable assets into reproducible capital and surplus returns (or rents) could be produced in the process. Several authors explained the formation of rents in the past⁸. The current understanding corresponds with that of Smith (1776), who explained rents as the additional earnings that could be earned by producers with costs that are less than the highest cost producer, i.e. the highest cost mine determines the size of the rent produced by other mines⁹. Carey's (1837) observation that the size of the rents could be optimised by technological advances over time has also become a major factor to consider in the modern era, i.e. capital investment is crucial for sustaining rents.

⁷ There are many arguments for and against each level of ownership. In South Africa the interpreter could seek guidance from the Freedom Charter (1955) for the public opinion and the MPRDA for the law on the matter. When the Charter was drafted, the system of law provided for individuals and companies to own mineral rights as immovable property. The Charter wanted to end this narrow individual benefit and stated that *"The people shall share in the country's wealth [and] the mineral wealth beneath the soil...shall be transferred to the ownership as a people as a whole"*. This was made possible by giving the State custodianship over all minerals through the MPRDA.

⁸ See Cawood (1999) for a summary of the extensive theory of mineral rents.

⁹ Smith's definition is still the most widely accepted explanation internationally and many recent authors e.g. Cordes (1995) have based their interpretation on his writings. This interpretation views rents as bonus (surplus) returns over and above what was initially expected. Because the return is above that expected initially it will not be missed and can be taxed away without influencing the investment decision. The mineral owner's perspective is that the bonus is as a result of resource characteristics. However, the company's perspective is that entrepreneurship often creates the higher returns.

The recipients of rents are defined by the legal system of a country. It is the role of public policy¹⁰ to optimise the sharing of rents by ensuring that their use is in best interest of society. In countries that rely on the private sector to develop the economy, the investor gets a share of the rent (in the form of a profit or dividend) to compensate for the risks taken, while the State receives its royalty. Communities can either receive royalties or demand contributions to socio-economic programmes.

What are the design considerations?

There are many considerations¹¹ that policy makers must take into account in the design of a royalty regime. These considerations became more complex over time as mineral royalties became cluttered with more and more issues. Although the theory on mineral royalties dates back to ancient times, the complications cause today's governments to still find it difficult to design appropriate royalty regimes. No perfect '*off-the-shelf*' solution had been developed to date and no universal best practice royalty exists. The ideal royalty must therefore achieve two conflicting goals, namely that it must be predictable to both government and the investor, but at the same time also be flexible and responsive to the unique issues of the country and mineral market cyclicity. Bradley (1986) appropriately observed that "*standardization and consistency are interrelated, and both are desirable. If a single set of rules is to be generally applicable it must accommodate a diversity of situations. If it is to stand the test of time it must be flexible*". In theory the net present value (NPV) of the royalty should equal the value of the mineral resource, but this is

¹⁰ Public policy is also influenced by society's desire to allow mining activity in the first place. In this regard there are two conflicting points of view, namely that of Hotelling (1931), who advocated '*savings*' by allowing the resource to increase in value in-situ; and that of Tilton (1992), who argued that an in-situ (dormant) asset contributes nothing to society's welfare and that it is better to convert the resource into capital that can be used to grow the economy.

¹¹ These include the legal system of the country, its history, economic stage of development, country dependence on mineral production, political will and ideology, public expectations, wealth patterns, relative bargaining strengths of investors and the host government, identity and expectation of the resource owner, mineral (geologic) endowment, the unique properties of a mineral resource, resource economics marketing arrangements and mineral processing and refining requirements.

difficult to achieve because the royalty structure is influenced by the risk appetite and expectations of the parties involved.

What are the royalty options?

Cordes (1998) described a mineral royalty as a special tax that is appropriated directly (*in rem*) “...against the mineral deposit or the inputs used to exploit it...” The amount is aimed at systematic compensation as depletion occurs over time. Because it is periodic, regular ‘*instalments*’ are made towards the total value of the mineral resource. The objective being that the final instalment is paid on the last day of the mine’s life and the sum of instalments represents the value of the resource. The basic components of any royalty system are *first*, the base (defined as either production volume or some definition of income), *second* the rate, i.e. the unit of production or percentage that must be multiplied with the base and *third*, the source (the activity at which the royalty is aimed). Most mineral royalty regimes fall into three broad categories, namely:

1. *Production royalties*¹², which are unit-based and expressed in the same unit as the resource e.g. an amount per tonne. The royalty payable¹³ is calculated by multiplying the rate per unit with the rate of production;
2. *Ad-valorem royalties*, which are value-based and expressed as a percentage of value. The royalty payable¹⁴ is calculated by multiplying the percentage rate¹⁵ with the value¹⁶ amount;

¹² Production royalties were the norm during the Colonial or pre-World War II era. Royalty instruments were simple (often based as a percentage of production) and ensured easy and cheap access for preferred (colonial) companies. The mineral tax regimes for these companies were often royalty-dominated, i.e. the royalty was the most important tax payable to the host country.

¹³ Royalty amount = $\frac{\$}{\text{tonne}} \times \frac{\text{tonne}}{1} = \$ \text{ Amount}$

¹⁴ Royalty amount = $\frac{\%}{100} \times \frac{\$}{1} = \$ \text{ Amount}$

¹⁵ The rate could be fixed or determined by formula, e.g. a sliding-scale royalty. Taussig (1911) promoted a system of sharing rents in proportion to the quality of the resource, i.e. higher quality mineral resources should attract higher royalties. Current African examples of this approach are the royalty regimes of Ghana and South Africa.

¹⁶ The definition of value is very important and normally defined in law. Typical examples are sales (invoice) value, NSR or profit before tax. Over time the base has proved to be more problematic than the rate of payment. This is because the base incorporates the allowable deductions before the rate is applied. Hardyman (2008) observed that most royalty litigation

3. *Quasi-royalties*, e.g. production sharing agreements, lump sum (fixed fee) payments and auctions.

Otto, et al. (2006) equated a mineral royalty as a mechanism reflecting the trade-off position between the risks the investor¹⁷ is prepared to accept against that of the owner¹⁸. A mineral royalty, it is therefore argued, expresses a '*willingness to pay for risk reduction*'.

What are the alternatives to mining royalties?

When considering alternatives for mineral royalties it is fundamental to establish whether mining is desirable or not. One view is that mining, as a destructive economic activity that pollutes the environment and disrupts communities, should not be allowed at all. Another view desires mining but prefers postponement, e.g. Hotelling (1931), who argued that a resource left in its natural state will increase in value over time due to scarcity. Tilton (1992) disagreed and argued that dormant (or unmined) assets contribute nothing to economic development and society's welfare. The strategy for any country is determined by policy and in South Africa it favours Tilton's view through enforcing *use-it-or-lose-it* law and policy instruments. The next consideration is a decision on the role of the State¹⁹, which provides the following alternatives to mineral royalties:

activity in the US involves deduction of post-production costs because it is extremely difficult to develop text allowing for deductibility of costs that is "*immune to litigation*". There is therefore a definite trend in the US to move away from the deduction of costs towards either a sales value definition or a formula approach (Pierce, 2008). This development is in contrast with the general literature in support of a NSR base, which is theoretically more appropriate (Cawood, 2007).

¹⁷ Mining company risks are typically the capital intensive nature of the extractive industries, long gestation periods and e.g. technical-, geological-, economic-, political- and marketing uncertainties.

¹⁸ In most cases the owner would rather seek a financial reward instead of developing the mineral itself. Government (as resource owner) perceive risks as entrusting non-renewable national resources to companies and receiving insufficient benefits in return for the depletion of a national asset.

¹⁹ Cordes (1995) observed that royalty schemes became more complex over time in response to price cycles and political economy. When prices are high, nations are tempted to operate State-owned mines in order to capture all of the benefits. However, State participation in the mining industry is not necessarily successful. He observed that when mineral prices fell in the past, most State companies could no longer efficiently operate their mines and they sought private capital to save their industries.

- A system of State participation²⁰;
- Resource rent taxation²¹; and
- Service agreements²².

HISTORIC MINERAL ROYALTIES ISSUES OF SOUTH AFRICA

This section describes the historical aspects that affect royalties in South Africa. It also explains why royalties have gained prominence in South Africa following the promulgation of the MPRDA (2002) and the subsequent release of the 2003, 2006, 2007 and 2008 Draft Royalty Bills²³. The main Issues of contention that were raised during the South African debate are also highlighted. The section ends with an explanation of the formula that the author developed in 1999, which is fundamental to the understanding of the new regime.

The past system of royalties in South Africa

The evolution of State royalties in South Africa²⁴ had largely been influenced by the common law mineral right ownership system, which allowed private parties to own mineral rights as property. Initially, mineral ownership was tied to land ownership. However, over time, mineral rights ownership was allowed to be alienated from that of the land. The Cradock Proclamation of 1813 allowed the State the right to mine certain strategic minerals, which principle later became an important cornerstone of the lease consideration for gold mines. In 1878, the royalty rate in South Africa was 2.5% of sales value,

²⁰ Government ownership (usually 5 - 15%, with the option to increase its stake) is a common practice in many African countries, especially in Central and West Africa. The policy instruments to achieve State ownership include nationalization of the industry (sometimes with and sometimes without compensation), working interest, carried interest and free equity.

²¹ This method requires the setting of a threshold rate of return and charging excess taxes on returns above such rate.

²² This scheme consists of management contracts and the provision of infrastructure in return for a share of mineral production.

²³ It took six years of drafting, consultation and intense debate to promulgate a Royalty Act that balanced the widely different perspectives and interests of stakeholders, which is the subject of the next section.

²⁴ For a comprehensive discussion of the evolution of mineral royalties in South Africa see Cawood (1999).

which rate was applied uniformly to all minerals in the old Transvaal Republic, regardless of ownership. In 1887, the rate for base metals was reduced to 1%, while all other minerals remained at 2.5%. The significant gold mine development on the Witwatersrand ushered in a special lease (or royalty) consideration regime for gold mining in South Africa, and the 1908 Gold Law made provision for a sliding-scale formula payable on profits. Each gold mine negotiated its own lease formula with the State, which formula differed significantly from mine to mine. Initially (1910 – 1922), the lease formula was linked to a minimum payment, but later on, it was possible for mines to be profitable but not pay a consideration (or royalty) to the State. The structure of the formula was as follows:

$Y = a - ab/x$, where y was the lease rate, a the maximum or marginal rate, b the lease free rate²⁵ and x the profitability ratio expressed as a percentage.

The purposes of calculating Y in the formula was to determine the rate of payment, which rate was applied to a base that closely resembled the definition of taxable income in the Income Tax Act. The purpose of the a -factor was to determine the maximum rate of payment while that of x was to slide the rate of payment between zero and $a\%$. There was no set minimum rate, in fact the b -factor allowed the rate to be zero in times of low profitability (5 – 10%) and effectively resulted in a royalty holiday during times when x fell below b .

The justification of the new royalty regime in South Africa

Lease formula payments ceased on 1 January 1994, two years after the promulgation of the Minerals Act 50 of 1990 in 1992, which Act repealed the long-standing Right-To-Mine (RTM) principle introduced in 1813. The MPRDA, with its provision for State custodianship over all minerals²⁶,

²⁵ When profits were below this percentage, the lease rate dropped to 0%.

²⁶ For an explanation of sovereignty, ownership and custodianship of mineral resources under South African mineral law see Cawood (2007).

refocused the attention on mineral royalties. The first two issues listed as *Fundamental Principles*²⁷ of the MPRDA read as follows:

- 2 *The objects of this Act are to -*
- (a) *recognise the internationally accepted right of the State to exercise sovereignty over all the mineral and petroleum resources within the Republic; and*
 - (b) *give effect of the principle of the State's custodianship over the nation's mineral and petroleum resources*²⁸.

The above provisions laid the foundation for a new method for collecting mineral royalties in South Africa and the opportunity for the country to align its mining taxation regime with that of other countries. Custodianship over mineral and petroleum resources became the justification for replacing the fragmented and poorly designed State mineral royalty system of the past²⁹. The matter was handed to the National Treasury to integrate mineral royalties with the broader fiscal policy of South Africa. Historically, this matter was left to the DME, who did not have the capacity to effectively design, collect and audit mineral royalties.

Issues of contention during the South African royalty debate

After vesting mineral custodianship in the State, the next step was to start the process of designing the new royalty. The first Draft Royalty Bill (2003) had value-based royalties with rates as high as 8%³⁰. The rates of the second Draft Bill (2006) ranged from 0 – 5% of sales value, with some allowance for a

²⁷ Section 2(a) and (b).

²⁸ Although the phrase '*State ownership of mineral and petroleum resources*' was avoided during the writing of the law, the National Minerals Policy (1998) gives guidance to the intent of the MPRDA with the statement ...*1.3.6.1(ii) Government's long-term objective is for all mineral rights to vest in the State...*

²⁹ The exception was the mineral lease formula system. However, although the structure of the formula was standardised, the variables differed significantly from mine to mine. It was criticised by the State for rewarding inefficiency and by industry for its inconsistency because some other mines paid ad-valorem royalties as high as 5%.

³⁰ The Bill was criticised for its mineral discrimination through having high rates for some minerals while exempting others from royalties. There were several submissions by a wide range of stakeholders that expressed similar concerns.

reduced royalty for refined metal products and marginal mines³¹. The third Draft MPRRB (2007) then followed, which contained a formula to calculate the rate that was based on a NSR definition of income. The fourth and final draft MPRRB (2008) then followed. Determination of the royalty rate was still by formulae, but only after classifying the mineral as either refined or unrefined. This was necessary because of the difficulties associated with developing suitable text for NSR to include allowable deductions. This allowed the base to revert to a gross sales definition. EBITDA in the formula was also replaced with EBIT, which brought it much closer to PBT. A minimum rate of 0.5% was introduced while the variables of the formulae made provision for a maximum rate of 5% for refined minerals and maximum 7% for unrefined minerals.

The Formula proposed by Cawood

In his response on the third Draft Royalty Bill Cawood (2008) concluded that it represented a balance between the contents of the first two drafts and the feedback National Treasury received to that date. He further suggested that:

- The royalty rate should be made subject to a minimum rate of 0.5%;
- EBITDA in the formula be replaced with the more familiar Profit Before Tax (PBT) similar to the income used in the x-factor calculation as applied to gold mining taxation in South Africa; and
- The variables of the formula are adjusted so that the rate slides between 0.5% (unprofitable mines) and 5% (highly profitable mines).

He based his recommendations on an earlier submission to the National Treasury (Cawood, 2003) and summarised the important mineral royalty lessons from past South Africa as follows³²:

³¹ Cawood (2007) pointed to the inequity of such a regime and recommended that the table of mineral royalty rates could be replaced by a single formula with a base on NSR. In an attempt to expedite the process the National Treasury held consultation workshops in 2007. The participants at the workshops agreed that a NSR type royalty, instead of a sales revenue royalty, is perhaps more appropriate for South Africa.

³² Published as a series of letters to the Minister of Finance.

- There should be an appreciation of the ‘*ability to pay*’ principle³³;
- It is important to provide for minimum³⁴ and maximum³⁵ rates; and
- The x- or profitability ratio for gold mines is a sustainable profitability indicator.

Taking cognisance of these lessons, a sensible royalty formula then takes the following shape³⁶:

$$Y\% = \text{minimum rate} + \text{allowance for higher royalties in times of high profitability, or simply } Y\% = a + b$$

In the formula Y% is the royalty rate; (a) the minimum rate; (b) the rent premium and (a + b) the maximum rate. The b-factor provides for a profit sharing or sliding-scale mechanism between the minimum and maximum rates. In order to achieve a situation that highly profitable mines pay a higher royalty and vice versa and using the x-factor as a profitability indicator, the b-factor of the formula changes to:

$$b = \frac{X - \text{Ratio in current year}}{\text{Factor to achieve the maximum rate}}$$

If this information is incorporated in the structure of the original formula on the assumption that the maximum profitability rate is 100%, the formula will have the following appearance:

$$Y\% = 1 + \frac{X\%}{50} \quad \text{For a minimum rate of 1\%, maximum rate of 3\% and}$$

Factor F to achieve the maximum rate requires solving the equation

$$3 = 1 + \frac{100}{F} \quad \text{with F then calculated as a factor of 50; and similarly}$$

³³ Such ability depends on the relationship between sales revenue and the cost for producing the minerals.

³⁴ A minimum royalty ensures that the State receives “...something for its exploited resources even when the operation was unprofitable (p. 14)” (Otto, et al., 2006).

³⁵ In order to channel surplus payments to the State during times of high profitability.

³⁶ The formula was developed combining the original principles of the State’s historic lease and royalty considerations with leading international royalty practice. It was first documented in Cawood (1999) and later summarised in Cawood and Minnitt (2001).

$Y\% = 1 + \frac{x\%}{25}$ for a minimum rate of 1% and a maximum rent premium of 4%, Factor F is calculated as 25.

The table below shows how the royalty payment will slide between the minimum and maximum depending on profitability.

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

The advantages of such a formula scheme include reduced discretion by the administrators of the regime, encouragement of beneficiation³⁷ of mine production, automatic marginal mine relief during difficult times³⁸, guaranteed royalty revenue for the State during times of low mineral prices, bonus royalties during boom times and relatively ease of administration.

COMMENT ON THE MAIN FEATURES AND PURPOSE OF THE ACT

The preamble of the Royalty Act³⁹ reads:

³⁷ There are many ways to encourage beneficiation using the formula approach, namely:

- Grant tax incentives like exemptions, tax holidays and favourable treatment of capital expenditure when minerals are beneficiated;
- Introduce two formulae with different b-factors in order to reduce the rate for value-added products;
- Forfeit the b-factor in order to promote downstream beneficiation of mineral production and/or
- Define the base to exclude costs associated with beneficiation.

³⁸ It has therefore the potential to prevent premature closure and job losses.

³⁹ See Appendix A for the structure and naming of the Royalty and Administration Acts.

"To impose a royalty on the transfer of mineral resources and to provide for matters connected therewith."

Transfer of production triggers the royalty⁴⁰ and is the initial disposal of beneficial ownership by an extractor, export, consumption, theft, destruction or loss⁴¹ of the mineral resource. It is therefore possible to still pay the royalty even if no revenue is received for production. An *extractor*⁴² is deemed a person who wins or recovers a mineral resource from within South Africa as a result of mineral resource rights⁴³ granted under the MPRDA. The definition of a *mineral resource* is as defined in Section 1 of the MPRDA⁴⁴, which Royalty Act definition includes petroleum products. The classification of the mineral has an impact on both the royalty base and the rate of payment. As a general rule the rate is reduced as beneficiation increases in order to compensate for the larger base due to the higher prices received for refined products. A *refined mineral resource* is as listed in Schedule 1⁴⁵ of the Royalty Act. Alternatively it is a mineral resource in a readily saleable refined condition that has undergone a comprehensive level of beneficiation, smelting and refining. An *unrefined mineral resource* is a mineral resource listed in Schedule 2⁴⁶ of the Act. The Act is silent on the issue of double payment of

⁴⁰ The first transfer triggers the royalty and not subsequent transfers.

⁴¹ Other than by way of flaring or other liberation into the atmosphere during either the exploration or production stage.

⁴² The definition of extractor must be read with Section 2.

⁴³ A mineral resource right is used as a generic term for the following rights and permits issued under the MPRDA:

- Prospecting rights for minerals or exploration rights for petroleum;
- Mining permits, retention permits or mining rights for minerals; and
- Production rights for petroleum.

⁴⁴ A mineral is defined in Section 1 of the MPRDA as '*Any substance, whether in solid, liquid or gaseous form, occurring naturally...and...formed by or subjected to a geological process...and...includes sand, stone, rock, gravel, clay, soil and any mineral occurring in residue stockpiles or in residue deposits, but excludes...water...petroleum...peat*'

⁴⁵ See Appendix B. Examples of refined minerals are:

- Gold, when processed to at least 99,5 per cent purity;
- Platinum Group Metals, once processed to at least 99,9 per cent purity;
- Copper; once processed to at least 99.0%; and
- All oil and gas resources at the inlet of the refinery.

⁴⁶ See Appendix C. It includes Coal; Diamonds; Concentrates and bulk production; and/or Dual listed minerals that fail to meet the Schedule 1 condition. Dual schedule minerals can fall under both Schedules (e.g. platinum). In these circumstances, the mineral will be viewed as refined if developed to or above the refined condition; otherwise, it is deemed unrefined. For example, platinum with a purity of 99.9% or above is viewed as refined, while all other conditions less than 99.9% are considered unrefined.

royalties⁴⁷, which double payment becomes a definite possibility when communities levy their own royalties on extractors.

The basic royalty regime

The determination of the royalty amount⁴⁸ is as follows:

$$\text{Royalty amount for assessment period} = \text{Royalty rate as determined by formula} \times \text{Royalty base defined as gross sales}$$

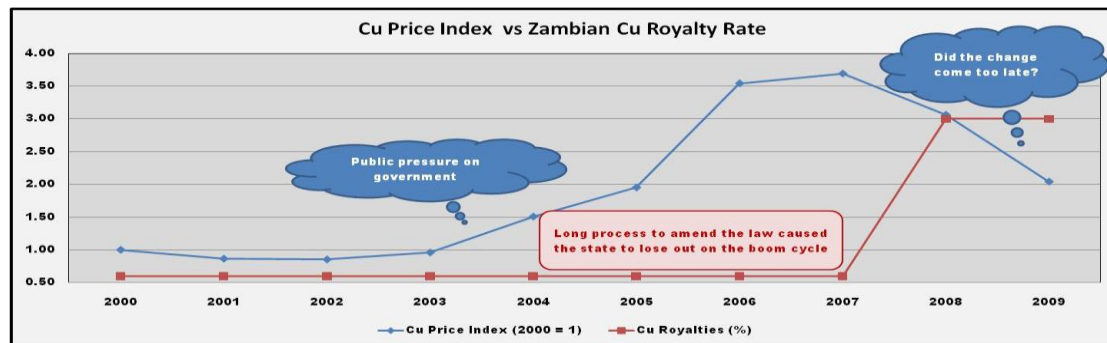
The royalty rate

The rate is calculated by using the appropriate formula, which is selected after classifying the mineral resource as either refined or unrefined. The objective is for the rate to vary with the economics of the mine, rather than having a fixed royalty rate for each mineral product. This approach is justified by empirical evidence such as the Zambian experience illustrated in Figure 1. The figure shows the fixed copper royalty rate of 0.6% (2000 – 2007) and the copper price index (2000 = 1.00) over time. While the royalty rate was initially appropriate, public pressure for a higher royalty mounted when the market price started to rise in 2004. By 2007 prices were 3.5 times higher than those in 2000. The long process required for amending the law resulted in the government losing out on mineral rents during the boom time. In 2008 a new royalty rate of 3% was introduced. The potential problem with the new rate is the downward price trend from the 2007 peak. The lesson is that when governments introduce fixed royalty rates, the rate requires regular adjustment in order to capture a portion of the rents during good times and provide relief during the bad times. However, the time consuming legal process often cause government timing to be wrong. A formula approach eliminates this problem because the royalty rate automatically slides along with the market cycle.

⁴⁷ MPRDA Schedule II, Section 11(1) provides for community royalties to continue after the five year conversion period.

⁴⁸ Royalty Act Sections 3 to 6.

Figure 1 Classic fixed-rate royalty problem: The case of Zambia



The Royalty Act makes provision for the royalty rate to fluctuate with EBIT⁴⁹. The nature of the formula is sliding-scale with profitability (EBIT) the mechanism for determining the rate. When EBIT becomes negative, it is replaced with zero. The concept is based on the fundamentals of the formula⁵⁰ developed by Cawood (1999). The rates for refined and unrefined minerals are calculated with the following formulae:

$$\text{Refined rate (Yr)} = 0.5 + [\text{EBIT}/(\text{Aggregate gross sales} \times 12.5)] \times 100$$

$$\text{Or stated alternatively; Yr \%} = 0.5 + x/12.5; \text{ and}$$

$$\text{Unrefined rate (Yu)} = 0.5 + [\text{EBIT}/(\text{Aggregate gross sales} \times 9)] \times 100$$

$$\text{Or stated alternatively; Yu \%} = 0.5 + x/9.0$$

$$\text{Both formulae are based on a structure of } Y\% = (a + b) \text{ where } b = x/F$$

The minimum rate (a-factor in the formula) is 0.5% for both refined and unrefined minerals. Factors 12.5 and 9.0 determine the maximum rates of 5% and 7% respectively for refined and unrefined minerals. The maximum level

⁴⁹ EBIT or Earnings Before Interest and Taxes closely resemble net profit and/or profit before tax definitions.

⁵⁰ $Y\% = 1 + [x\% \div 50]$, which allowed for the rate to slide between 1 and 3% when there are profits. The structure of the formula made it possible for the rate to be less than 1% when x% (or profitability) is negative, but never 0%. The dual formula system is a refinement of Cawood's original intent of a single formula approach. The problems associated with a base of NSR are avoided by adjusting the parameters of the original formula so that the base could be gross sales and reducing the rate as the value of the base increases due to higher value-addition to the original mineral resource. The effect is that $Y\% = \text{Minimum royalty} + \text{allowance for higher royalties in times of high profitability}$.

of profitability is assumed to be 60%, which is perhaps an improvement of Cawood's idealistic 100%. The last two columns in Table 2 demonstrate how the rates fluctuate according to the EBIT to sales revenue ratio (x-factor in the formula).

Table 2 Profitability and its impact on sliding-scale rate calculations

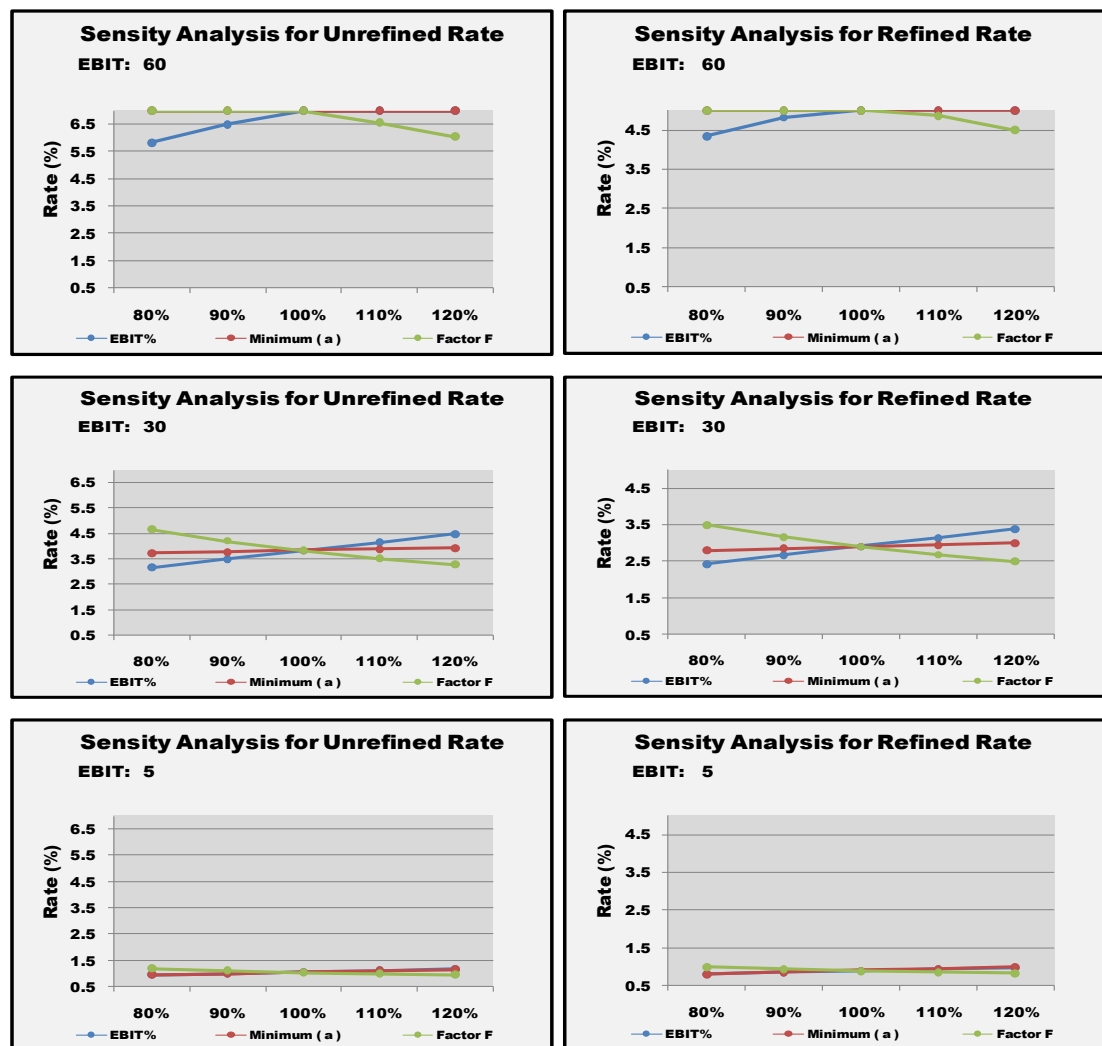
SLIDING-SCALE RATE CALCULATION (ROYALTY AND GOLD FORMULA)					
Profitability (%)	Gold Lease Rate ($y = 15 - 90/x$)	Gold Tax Rate ($y = 43 - 215/x$)	The Formula ($y = 1 + x\%/50$)	Unrefined Royalty (%)	Refined Royalty (%)
-10	0.0	0.0	0.8	0.5	0.5
0	0.0	0.0	1.0	0.5	0.5
5	0.0	0.0	1.1	1.1	0.9
10	6.0	21.5	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

Earnings before Interest and Taxes

EBIT is the acronym for *Earnings before Interest and Taxes* as determined for financial reporting purposes. Figure 2 illustrates how the two formulae cause the rates to slide between the minimum rate of 0.5% and their maximum rates as EBIT changes. As expected, the sensitivity analysis demonstrates that:

- At maximum rates of profitability (when the EBIT-ratio approaches 60%), the royalty rate is most sensitive to EBIT and then the F-factor. At 60% the variables are overruled by the maximum (regulated) rates;
- At average rates of profitability (when the EBIT-ratio is between 20 and 30%), the royalty rate is most sensitive to Factor F and then EBIT; and
- At marginal rates of profitability (when the EBIT-ratio approaches 0%), the royalty rate is most sensitive to the minimum (a-factor) and then factor F.

Figure 2 Impact of the formula parameters on the royalty rate



The National Treasury decided on EBIT as the desired indicator of profitability and it is defined as gross sales after adding recoupments⁵¹ under the Income Tax Act⁵², (ITA) *minus* Capital expenditure⁵³ *minus* Operating expenditure. The intention of the National Treasury is to identify the earnings attributable to the winning and recovery of mineral resources up to its saleable state. General exclusions from EBIT are:

⁵¹ ITA Section 8(4) recoupments deal with amounts already allowed as deductions from income, capital previously allowed as depreciation in the event of a (previous) disposal of the mining property and distribution of assets and transfer of obligations. The general rule is that recovery is limited to the original cost of the asset.

⁵² Income Tax Act (ITA), 1962 (Act 58 of 1962).

⁵³ Capital expenditure includes unredeemed amounts but excludes the capital redemption allowance (for gold mines). Inclusions into capital for the purpose of the royalty calculation are the usual 100% mining capital expensing rule and post 1 May 2009 depreciation allowances in terms of S36 of the ITA. The general rule is that the same capital cannot have a double impact on reducing the royalty e.g. when the unredeemed amount causes a profit upon the disposal of an asset.

- The cost of any financial instrument⁵⁴, except for option or forward contract (price hedging) costs, which can be included;
- Any general deductions allowed in the determination of taxable income as allowed in terms of Section 11(a) of the ITA;
- Deductions for expenditure incurred in respect of transport, insurance and handling of minerals beyond mining and refining;
- Any balance of assessed losses⁵⁵ mentioned in Section 20(1)(a) of the ITA;
- Any deduction as a result of foreign currency losses allowed under Section 24I of the ITA
- Any determination in respect of an impermissible tax avoidance arrangement contemplated in Part IIA of the ITA; and
- Any deductions contemplated in paragraph 5(2) of the 10th Schedule to the ITA⁵⁶.

To summarise, EBIT is similar as for financial reporting purposes, but only earnings attributable to the winning and recovery of mineral resources are considered⁵⁷. Negative EBITs are deemed to be nil in order to avoid the situation where it could reduce the minimum royalty to less than 0.5%.

The royalty base

⁵⁴ Section 1 of ITA defines these as interest payments on debt, cost of carrying derivatives and currency hedges.

⁵⁵ These are loss carry forwards. Note that only operating loss carry forward is excluded and unredeemed capital amounts can be carried forward, i.e. capital taken into account for purposes of paragraph 5(1) of the Tenth Schedule of the ITA.

⁵⁶ Cost uplifts allowed in the petroleum sector.

⁵⁷ Section 4 of the Royalty Act deals with EBIT for composite mineral resources, i.e. when an ore body contains a range of market products that are refined to various levels. The general rule is to allocate EBIT deductions (refined versus unrefined) according to a reasonable method that is applied consistently. If the value of the refined proportion is less than 10% cent of the total value, the resource may be treated solely as an unrefined mineral and vice versa.

The base is defined as the arm's-length gross sales value less allowable deductions⁵⁸ over a 12-month assessment period. The definition of gross sales serves a dual purpose, namely to establish the tax base and to be the denominator to EBIT in the formula for calculating the profitability ratio. The unusual provision that the gross sales amount may be subject to arm's-length adjustments, is worthy of a discussion. The adjustment for disposals outside the specified condition or range could occur by either arm's-length valuation or according to a specified procedure⁵⁹. Tables 3 and 4 apply the procedure for both refined and unrefined gross sales adjustments⁶⁰.

Table 3 Adjustment of Schedule 1 mineral products

GROSS SALES ADJUSTMENTS FOR REFINED MINERALS					
	Stipulated status (%)	Grade Sold Below Range	Upward adjustment	Grade Sold Above Range	Downward adjustment
Mineral	1st Saleable point	Actual status (%)	Gross sales adjustment factor	Actual grade (%)	Gross sales adjustment factor
Cobalt (%)	99.50	98	1.015	100.00	0.995
Copper (%)	99.00	98	1.010	100.00	0.990
Germanium (%)	99.99	98	1.020	100.00	1.000
Gold (%)	99.50	98	1.015	100.00	0.995
Lead (%)	99.00	98	1.010	100.00	0.990
Lithium (% LiCO ₃)	99.50	98	1.015	100.00	0.995
Mercury (%)	99.90	98	1.019	100.00	0.999
Molybdenum (%)	99.99	98	1.020	100.00	1.000
Nickel (%)	99.50	98	1.015	100.00	0.995
PGM (%)	99.90	98	1.019	100.00	0.999
Silicon (% Si)	98.50	98	1.005	100.00	0.985
Silver (%)	100.00	98	1.020	100.00	1.000
Talc (%)	98.50	98	1.005	100.00	0.985
Zinc (%)	98.5	98	1.005	100.00	0.985
Oil & Gas	All grades				

⁵⁸ These are limited to off-mine costs. Non-deductible expenses are smelting, refining, processing, crushing, processing, sintering and sorting.

⁵⁹ This implies the separate determination of a value for the amount that would have been received had the minerals been beneficiated to the desired stage. When a mineral is sold below the refined Schedule 1 condition, in which case the gross sales price is increased to a hypothetical refined condition price. For example, when gold is disposed of at 98% purity instead of 99.5%, an upward adjustment of $99.5 \div 98 = 1.015$ applies with the formula for refined minerals. When a refined mineral is sold above the refined Schedule 1 condition, the gross sales price is reduced to a hypothetical refined condition price.

⁶⁰ If an unrefined mineral is sold above the unrefined Schedule 2 condition, the gross sales price is reduced to a hypothetical refined condition price and if an unrefined mineral is sold below the unrefined Schedule 2 condition, the gross sales price is increased to a hypothetical refined condition price. If chrome concentrate is sold in a condition below the specified range (say 33%, instead of the minimum 37%), 37% would have a higher value and the adjustment is therefore upwards (adjustment = $37 \div 33 = 1.121$). If the sales condition is above specified range, e.g. in the case of iron disposed of at 65% purity instead of the upper limit of 64%, the adjustment is downwards (adjustment = $61 \div 65 = 0.985$). The formula for unrefined minerals still applies.

Table 4 Adjustment of Schedule 2 mineral products

GROSS SALES ADJUSTMENTS FOR UNREFINED MINERALS BENEFICIATED OUTSIDE THE PRESCRIBED RANGE						
Mineral	Stipulated Range (%)		Grade Sold Below Range	Upward adjustment	Grade Sold Above Range	Downward adjustment
	1st Saleable point	Upper limit	Actual grade (%)	Gross sales adjustment factor	Actual grade (%)	Gross sales adjustment factor
Antimony (% Sb)	65.00	65.00	64.0	1.016	66.00	0.985
Barite (% BaSO ₄)	97.00	97.00	89.0	1.090	98.00	0.990
Beryllium (% BeO)	70.00	70.00	69.0	1.014	71.00	0.986
Chromium Concentrate (% Cr ₂ O ₃)	37.00	46.00	33.0	1.121	47.00	0.979
Chromium Chip & Lump (% SiO ₂)	4.00	10.00	3.0	1.333	11.00	0.909
Chromium Chip & Lump (Cr/Fe ratio)	1.45	1.25	1.2	1.208	1.25	1.000
Chromium Fine < 1mm (% SiO ₂)	0.80	6.00	0.7	1.143	7.00	0.857
Chromium Fine < 1mm (Cr/Fe ratio)	1.30	1.60	1.2	1.083	1.70	0.941
Coal A in-situ grade > 27.5 (GMJ/kg)	27.50	27.50	27.0	1.019	28.50	0.965
Coal B in-situ grade 26.5 - 27.5 (GMJ/kg)	26.50	27.50	26.0	1.019	28.50	0.965
Coal C in-situ grade 19.0 - 26.5 (GMJ/kg)	19.00	26.50	18.0	1.056	28.50	0.930
Coal D in-situ grade < 19.0 (GMJ/kg)	15.00	19.00	1.0	15.000	28.50	0.667
Cobalt (% Co)	7.00	7.00	6.0	1.167	8.00	0.875
Copper (% Cu)	20.00	30.00	19.0	1.053	31.00	0.968
Diamonds	All rough diamonds		Price to be determined by Government Diamond Valuator			
Fluorspar (%)	80.00	80.00	79.0	1.013	81.00	0.988
Graphite (% Carbon)	86.00	86.00	85.0	1.012	87.00	0.989
Iron (% Fe)	61.00	64.00	60.0	1.017	65.00	0.985
Lead (% Pb)	50.00	50.00	49.0	1.020	51.00	0.980
Limestone (% CaCO ₃)	54.00	90.00	53.0	1.019	91.00	0.989
Manganese (% Mn)	48.00	48.00	47.0	1.021	49.00	0.980
Mica (%)	48.00	48.00	47.0	1.021	49.00	0.980
Mineral sand Titanium: Ilmenite (% TiO ₂)	75.00	75.00	42.0	1.786	77.00	0.974
Mineral sand Titanium: Rutile (% TiO ₂)	53.00	53.00	52.0	1.019	81.00	0.654
Mineral sand Titanium: Zircon (% TiO ₂)	85.00	85.00	84.0	1.012	86.00	0.988
Nickel (% Ni)	1.40	1.40	1.3	1.077	1.50	0.933
Niobium (% Ni ₂ O ₅)	45.00	45.00	44.0	1.023	46.00	0.978
PGM (%)	0.015%	0.015%	0.01%	1.500	0.02%	0.750
Silver (g/t Ag)	0.080%	0.080%	0.07%	1.143	0.09%	0.889
Tantalum (%Ta ₂ O ₅)	30.00	30.00	29.0	1.034	31.00	0.968
Tin (%)	80.00	80.00	79.0	1.013	81.00	0.988
Tungsten (%WO ₃)	65.00	65.00	64.0	1.016	66.00	0.985
Uranium (% Oxide)	80.00	80.00	79.0	1.013	81.00	0.988
Vanadium (% V ₂ O ₅)	1.00	2.00	0.5	2.000	2.50	0.800
Zinc (% Zn)	27.00	27.00	26.0	1.038	28.00	0.964

The adjustment to the gross sales value is further illustrated in Figure 3 with respect to the stipulated coal products⁶¹. Coal is unusual when it comes to the adjustment of its sales value because of the allowance for various grades of coal in the unrefined state, namely:

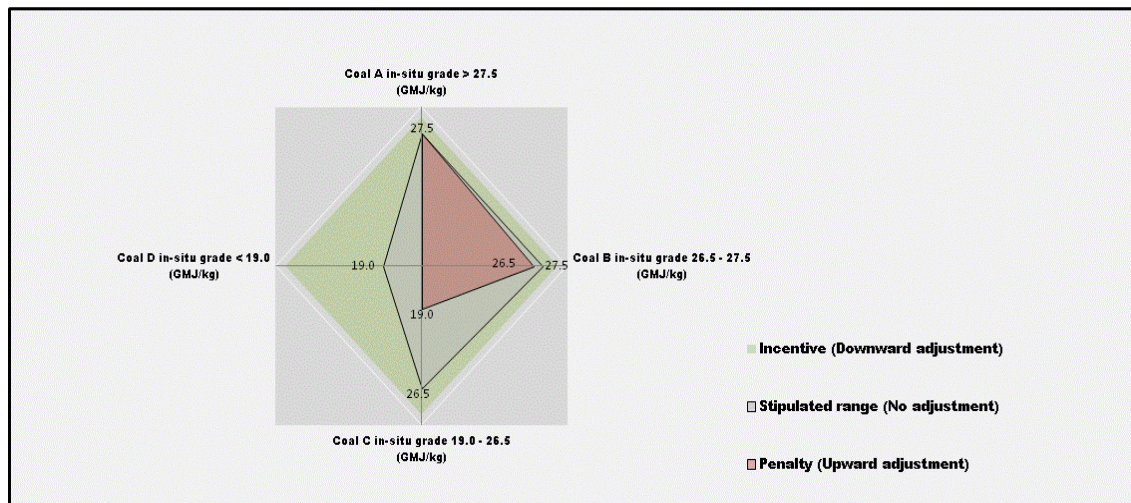
- Grade A: In situ calorific value equal or greater than 27.5 MJ/kg⁶²;
- Grade B: In situ calorific value of between 26.5 and than 27.5 MJ/kg;
- Grade C: In situ calorific value of between 19.0 and 26.5 MJ/kg; and

⁶¹ The adjustment starts with the grade of the in-situ coal resource. For example, if the in-situ grade is classified as Grade B (26.5 – 27.5 MJ/kg) and the actual sales product has a lower grade (26 MJ/kg), the price is adjusted upwards by using a multiplying factor of 1.019. The higher price will cause the royalty for unrefined coal to increase. However, it is also possible to reduce the royalty amount if Grade B coal is beneficiated to a higher grade (28.5 MJ/kg), which allows for the price to be adjusted downwards by using a multiplying factor of 0.965. Mines producing a range of coal products according to market requirements, will need to manage this situation very carefully.

⁶² Schedule 2 uses coal units of GMJ/kg, which is interpreted in this paper as MJ/kg.

- Grade D: In situ calorific value less than 19.0 MJ/kg.

Figure 3 Adjustment of coal products



Other provisions of the Royalty Act

Small mining business relief

Section 7 provides for the exemption⁶³ from the royalty payment when the gross sales value is less than ten million rand during the assessment period and the royalty payment is less than R100 000.

Exemption for sampling

The royalty is not payable on transfers for sampling purposes when the aggregate gross sales is less than R100 000 (Section 8). Sampling covers analysis and testing of samples as provided for in Section 20 of the MPRDA.

⁶³ Such relief is only applicable when the extractor is a South African resident and the person is duly registered as an extractor. In order to prevent splitting big companies into small businesses to take advantage of the relief provision, the royalty becomes payable when:

- The extractor at any time during that year holds the right to participate in more than 50% of the share capital or is entitled to exercise more than 50% of the voting rights, in any other extractor;
- Any other extractor at any time during that year holds the right to participate in more than 50% of the current or accumulated profits of the extractor; or
- Any other person or extractor holds more than 50% of the equity or voting rights of two or more extractors.

Rollover relief upon disposals

Section 9 applies when (mined) mineral inventory is part of the transaction when a mining operation is sold⁶⁴. Where the extractor to whom the mineral resource is transferred immediately qualifies for registration, the extractor that acquires a mineral resource in terms of a disposal is deemed to be the extractor that won or recovered the mineral resource. It then becomes possible to defer the royalty and such rollover requires the purchasing party to pay the royalty.

Anti-avoidance rules

Sections 10 to 12 will cause companies to amend their existing transfer pricing policies⁶⁵ in order to incorporate mineral royalty issues. Section 11 stipulates that any amount used for the calculation of EBIT and gross sales may be adjusted by the Commissioner to reflect arm's-length values⁶⁶.

Stability agreements

The Minister of Finance may conclude a binding Fiscal Stability Agreement (FSA)⁶⁷ with extractors in respect of an existing mineral resource right or in anticipation of the extractor acquiring a mineral resource right in the near future⁶⁸ (Section 13). It guarantees the terms and conditions of the right and

⁶⁴ A disposal of a mineral resource by an extractor is deemed not to be a disposal if the mineral resource is transferred in terms of an asset-for-share transaction; amalgamation transaction; intra-group transaction or a liquidation distribution.

⁶⁵ South AfricaRS (1999) Practice Note 7 guides valuations for transfer pricing purposes. An arm's-length price for connected persons generally means a price, terms and conditions that would have been adopted when independent (unrelated) parties do business.

⁶⁶ The arm's-length value is considered the open market value determined in the ordinary course of business between independent parties acting in good faith (without regard to the royalty), so that no conflict of interest exists in the transaction. The transaction amount must be without any special favour, concession or advantage to any person.

⁶⁷ This is positive and provides for special tax arrangements for extraordinary investments. Understandably, this option is not available for holders of retention and mining permits. Another point to keep in mind is that the FSouth Africa is not automatic but requires negotiation and agreement with the authorities. This process will provide for some flexibility in special cases.

⁶⁸ However, the agreement has no force if the right is not granted within one year of the date of the FSouth Africa.

the parameters of the formulae for the duration of the MPRDA right. The FSA is transferable upon disposal of rights if the transaction is between connected companies, an extractor may unilaterally terminate the FSA at any time. There is also provision for compensation in case of injury (Section 14).

Currency translation

Currency translation is applicable to both income and allowable deductions in foreign currency transactions (Section 15). The spot (exchange) rate of the date on which that amount was incurred applies⁶⁹.

Transitional royalty credits

Section 16 provides for credits against the royalties of the new Royalty Act in respect of any old order right payments⁷⁰. Such credits may not exceed the (new) royalty amount, do not apply to community royalties and are not allowed in respect of any lease mentioned in Item 9(7) of Schedule II (profit-sharing arrangements related to precious stones) to the MPRDA.

Closing items

The Act is binding on the State (Section 17) and will be referred to as the Mineral and Petroleum Resources Royalty Act of 2008. Actual payment starts on 1 March 2010.

Royalty Administration Act

The Royalty Act is supported by the Administration Act⁷¹ which deals with general administration matters. Its purpose is to administer matters in connection with the imposition of a royalty on the transfer of mineral resources

⁶⁹ The currency conversion is further regulated by Section 1 of the ITA.

⁷⁰ This section is important for parties that have lodged applications for conversions but the process is not complete on 1 March 2010 – hence both old-order lease payments and royalties would be due.

⁷¹ Administration Act 29 of 2008 as amended, GG Vol 521, No 31642 of 26 November 2008.

and matters connected thereto. As a general comment on administration issues, the proposed system will be a significant improvement on the historic system when the DME was responsible for the administration and collection of mineral royalties. The Administration Act gives further clarity on the following matters:

- Definitions (Section 1);
- Registration matters (Sections 2 and 3);
- Election for unincorporated body of persons (Section 4);
- Payments and returns (Sections 5 – 8);
- Assessments (Sections 9 – 16);
- Administration of Act by the Commissioner of SARS (Section 17);
- Applicability of the Income Tax Act (Section 18);
- Reporting (Section 19); and
- Provision for additional regulations (Section 20).

Conclusion

The Royalty Act represents a balance between the contents of the earlier drafts and the feedback the National Treasury received during the process. There is no off-the-shelf or best practice mineral royalty solution available internationally, which means that any royalty regime reflects a trade-off of opposing positions. The process that was followed in South Africa is proof that there is room for constructive input by citizens into the legislature. The principles of the Royalty Act should not only work for the complex South Africa situation, but could also be used internationally in the search for global leading practice in this respect. It is unavoidable that resource right holders will have to realign their reporting practices and introduce new systems of certifying the royalty parameters of the Royalty Act, for example:

- The technical sign-off by a competent person on the quantity⁷² required for calculating the base. This becomes especially important for mines producing a range of products e.g. coal producers;
- The technical and accounting input to the adjustments to price and revenue when mineral products are disposed off outside the specified conditions;
- On-mine definitions for gross sales and development of new mine-specific procedures for calculating the royalty rate, mine profitability and EBIT;
- Adjustment of transfer pricing protocols for valuation and reporting purposes;
- Auditor's integration of the royalty parameters with financial reporting and auditing definitions of gross sales revenue and EBIT; and
- A revised strategy on the optimal level of beneficiation for each operation taking account of the penalty for unrefined production because of the higher rate of payment.

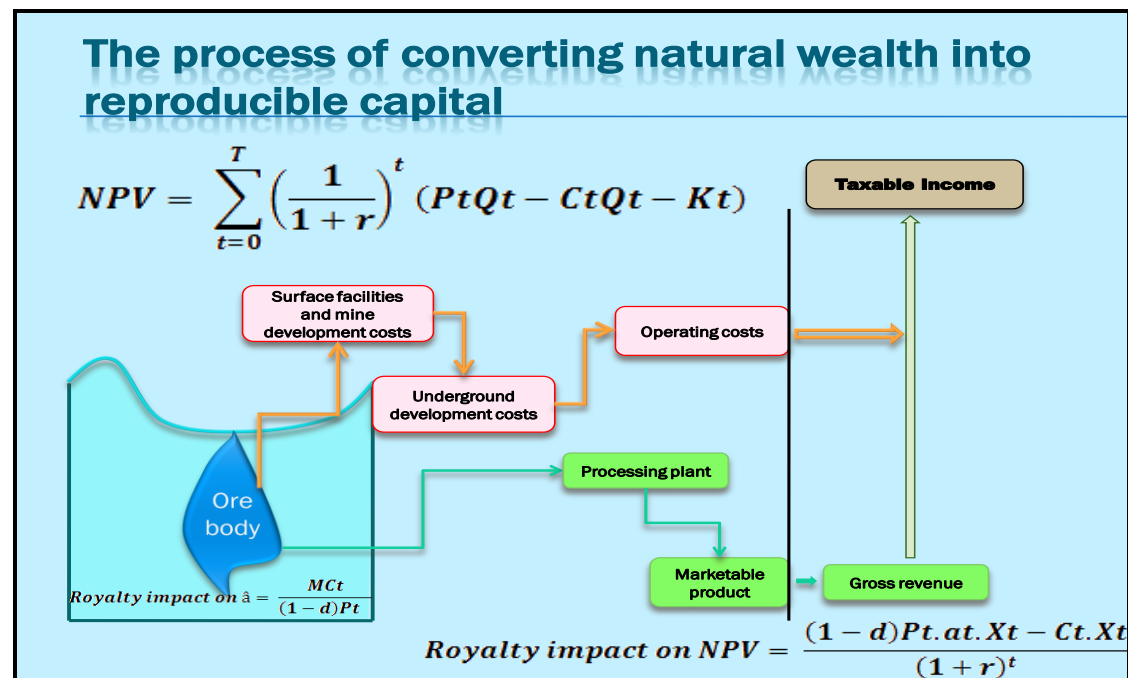
THE MEANING OF THE ACT AS MEASURED BY ITS IMPACT

This section investigates the impact of the Royalty Act on government, investors and more particularly, the South Africa mining industry. Before establishing what the Act means to these stakeholders, it is appropriate to consider the overall mining process of converting non-renewable (natural) capital into renewable (reproducible) capital. It starts with a particular ore body of unique economic characteristics such as shape, size, quality and distance to markets (Figure 4). The ore body is of little value in the ground and for it to become valuable, it must be accessed (developed), removed (mined), the valuable part must be separated from the body in which it occurs (crushing, processing, smelting and refining) and finally, moved to the market place (transported). This long mining process requires investment in the form

⁷² Royalty matters need to be incorporated in the mine's metal (mineral) accounting principles, which allow for the tracking, measuring, reconciliation and reporting of product volumes, mass and metal (mineral) content.

of capital and working costs and it could take many years before the valuable part could be exchanged for money⁷³. When this conversion eventually occurs there is no guarantee that the mining company would make a profit. Profits are calculated annually as part of the taxable income calculation and when this amount is positive, government's income tax is triggered. Mineral royalties affect the mining process in two ways. The first is that part of the ore body is sterilized because the cut-off grade is raised as a result of the royalty cost to the mine⁷⁴. The second is that annual cash flow is reduced by the royalty amount that is paid over to the State⁷⁵.

Figure 4 Basic cash flow associated with the mining process



⁷³ The value to the investor is calculated by $NPV = \sum_{t=0}^T \left(\frac{1}{1+r} \right)^t (P_t Q_t - C_t Q_t - K_t)$; where

NPV = Net Present Value of the investment
 P_t = Price in a given year
 r = Appropriate risk-adjusted discount rate or cost of capital
 C = Estimated variable costs per unit of output in each period
 K = Capitalised value of pre-production expenditure
 Q = Estimated total economic reserves
 t = Any given year from base year ($t = 0$) until closure ($t = T$)
 T = Estimated lifetime in years

⁷⁴ The impact of gross sales royalties on the cut-off grade ($\hat{a}$) is $\frac{MCt}{(1-d)P_t}$; where

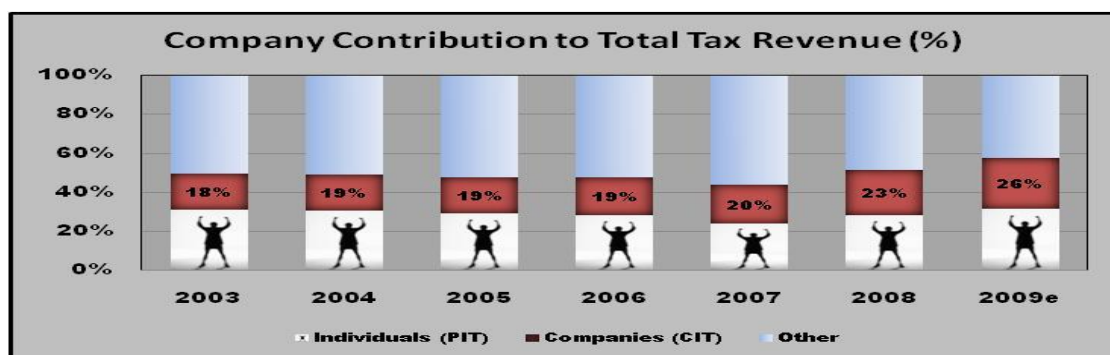
d = Percentage royalty
 $\hat{a}$ = Grade of ore to be extracted

⁷⁵ The impact of gross sales royalties on project value = $Royalty\ impact\ on\ NPV = \frac{(1-d)P_t \cdot at \cdot X_t - Ct \cdot X_t}{(1+r)^t}$ where MC = Marginal cost. Equations after Otto (1997).

Meaning of the Act to the State

The vesting of mineral ownership, or in South Africa's case custodianship, is a policy statement on government's position on NSONR and how minerals must be used to support the wider public good. The royalty is one source of revenue to government and becomes part of a larger pool of funds used for the running of the country⁷⁶. Figure 5 illustrates the main sources of tax revenue collected by the South African government. It shows that the contribution of individuals is about 30% through personal income tax (PIT), revenue as a result of company income tax (CIT) grew steadily from 18% in 2003 to 23% in 2008, while the balance comes from other taxes⁷⁷.

Figure 5 Personal and company income tax relative to other taxes



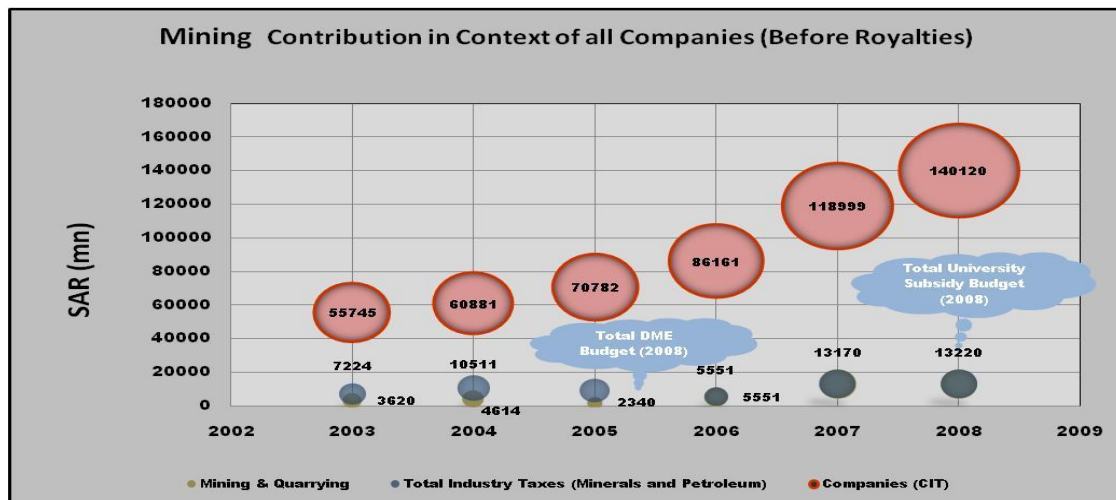
Sources: National Treasury & SARS - Tax Statistics and National Budget

Figure 6 illustrates that mineral and petroleum taxes account on average for about 15% of total corporate taxes.

⁷⁶ The size of the royalty income in relation to other government funds is directly related to factors such as mineral abundance, size of the industry and relative ease and cost of doing business in the country.

⁷⁷ For example secondary tax on companies, tax on retirement funds, value-added tax, customs duties, fuel levies, excise duties, the skills development levy and other taxes and duty charges.

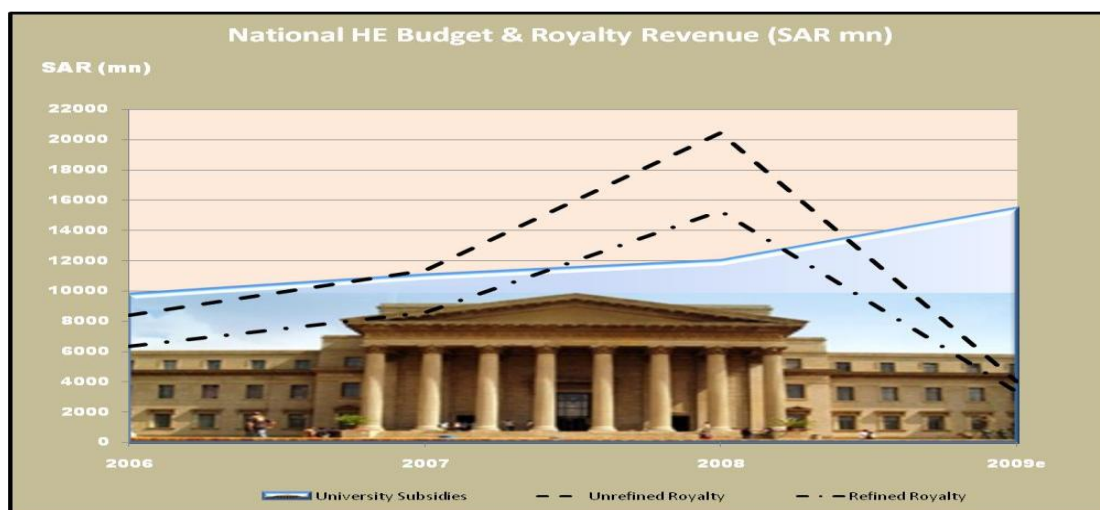
Figure 6 Mineral and petroleum taxes relative to total company income taxes



Sources: National Treasury & SARS - Tax Statistics and National Budget

Figure 7 illustrates the expected royalty income relative to the total university budget for the past number of years. It shows that, had it been effective from 2006 to 2008, the new royalty on its own would have generated sufficient income to government to cover this budget item. The figure also shows how unpredictable rent-based fiscal instruments are and how quickly economic cycles change over time⁷⁸.

Figure 7 Mineral royalties and the annual higher education budget

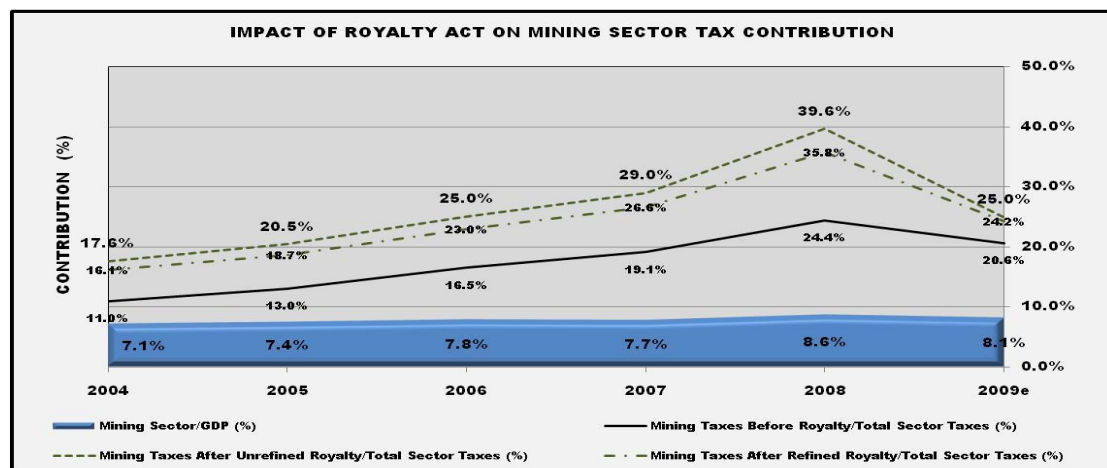


Sources: National Treasury, SARS, StatsSA P0041 and P0044

⁷⁸ 2008 and the estimate for 2009 are cases in point. In good years (e.g. 2008) the State can expect much more royalties compared to down cycles (e.g. 2009).

Figure 8 illustrates that mining taxes account for 16.8% of total company taxes (solid line) while its contribution to GDP averaged 7.8%⁷⁹. The gap between the chain and broken lines is an indication of the ‘*penalty*’ that is applicable when minerals are not beneficiated to the levels stipulated in the Royalty Act⁸⁰. The figure shows that the expected impact of the Royalty Act is about a 7% rise in mining’s contribution to company taxes or alternatively stated, mining taxes are expected to rise by about 50% after implementation of the Act in 2010. The Act’s potential impact is therefore significant. There is therefore no doubt that mining will play an even bigger part in the national economy of future South Africa⁸¹.

Figure 8 Mining taxes relative to other taxes and the new royalty



Sources: StatsSA P0044 and P0441

Meaning of the Royalty Act to investors

When it comes to the meaning of the Act to investors, there is not much difference between the positions of international and local investors. Although

⁷⁹ The calculation is based on the statistics for the past five years. The broken and chain lines show how the Royalty Act would have impacted on the actual numbers had it been in force.

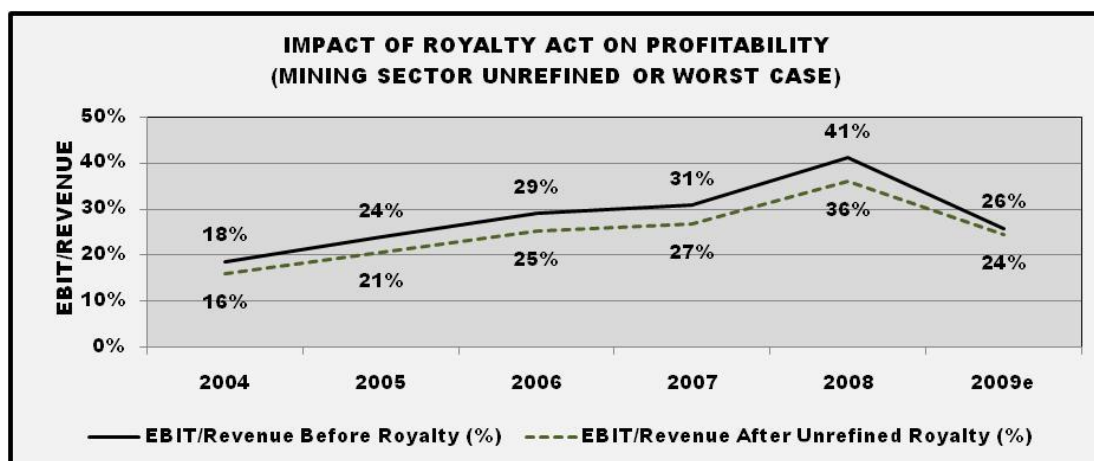
⁸⁰ Such a study should also include an economic analysis comparing the value-addition costs with the difference in royalty amount when the lower royalty rate for refined minerals is applied to the larger base due to a higher price. The ‘*savings*’ in the royalty payment must be compared with the costs that are necessary to bring the minerals to the refined state.

⁸¹ It is important that there is public appreciation for its contribution. Such an appreciation will avoid or counteract the ill-informed but popular political statements on nationalization and its perceived benefits.

mining companies are comfortable with paying mineral royalties, they are sensitive to the impact of such royalties on profitability and certainly don't want frequent changes to either the base or the rate⁸². The potential impact of the Royalty Act on profitability is illustrated in Figure 9, which compares the actual profitability (solid lines) for all South African mineral producers against what the profitability would have been had the Royalty Act been in force (broken lines) during the past few years⁸³. The graphs illustrate the following points:

- The impact is very difficult to predict because of changing market prices;
- The profitability ratios ranged significantly, which is indicative of the cyclic nature and the need to spend capital in the industry; and
- The impact, as measured by the gaps between the lines, of the royalty differs according to the level of profitability, which is the intention of the formula. The impact is significant during times of high profitability, while less significant during times of low profitability.

Figure 9 Impact of the Royalty Act on mining industry profitability



Sources: StatsSA P0044 and P0441

⁸² The setting of the base and rate requires an equitable balance. When the amount collected is too low, there is public resistance because of perceived deprivation of benefits. When the royalty amount is too high, investors will seek alternatives resulting in capital to flows to other (competing) destinations.

⁸³ The estimate for 2009 is based on the results for the first two quarters of 2009.

Impact of the Royalty Act on South African gold mines

This section adds the new royalty regime to the actual quarterly information as reported by the gold-mine members of the Chamber of Mines (COM) of South Africa. The rationale is to investigate the impact on South Africa's ageing, high cost gold mining industry. It determines the impact the Royalty Act would have had if it were in force over the past 15 years, which period included both highly profitable and loss-making cycles in the gold market. It uses reported information without any bias on price, costs, profit margins, rates of production, or any other uncertain variable. In addition to analysing the impact of the Royalty Act, this section includes a quantitative comparison with the historic gold lease consideration system⁸⁴ and the formula proposed by Cawood (1999)⁸⁵. Table 5 provides a sample calculation showing 1996 data in order to evaluate the impacts of the three schemes. Quarterly analysis is particularly useful for applying the marginal mine relief of the Royalty Act and the zero lease rate for the lease consideration system when the x-factor dipped below 6%.

⁸⁴ The gold lease consideration system that is used in this analysis is payable on profits (similar to accounting taxable income) on a rate of $y\% = 15 - 90/x$, where y is the lease rate; 15 the maximum lease rate; and x the profit to revenue ratio expressed as a percentage. For a comprehensive review on the structure and application of the lease formula see van Blerck (1992).

⁸⁵ The rate calculated by the formula must be applied to a base of NSR, which is estimated as 80% of the sales price. The structure of the formula is $y = 1 + x/50$ where y and x have the same meanings as those for the lease formula.

Table 5 Calculation of the royalty amounts for 1996

SAMPLE OF CALCULATION (1996 DATA)				
COM DATA (ACTUAL DATA)	1996.1	1996.2	1996.3	1996.4
AGGREGATE WC/KG	39,551	41,249	44,326	43,367
KG PRODUCED	116,996	113,079	112,875	117,817
TOTAL REV	5,710,236,000	5,971,285,000	6,175,302,000	6,568,277,000
TOTAL WC	4,649,850,000	4,660,117,000	4,983,307,000	5,094,538,000
CAP COST	609,031,000	675,231,000	683,374,000	848,252,000
AVERAGE GRADE	5.07	4.93	4.81	4.84
CALCULATED FROM COM DATA	1996.1	1996.2	1996.3	1996.4
TOTAL COST (Rand)	5,236,320,021	5,339,614,296	5,686,653,520	5,957,617,502
TOTAL TONNES (t)	23,076,036	22,936,856	23,466,653	24,342,335
PROFIT (Rand)	473,915,980	631,670,704	488,648,480	610,659,498
PROFIT/REV (X%)	8.30	10.58	7.91	9.30
EBITDA/REV (%)	24.18	26.43	23.80	25.16
TOTAL COST/TONNE (R/t)	226.92	232.80	242.33	244.74
PRICE/GRAM (R/g)	48.81	52.81	54.71	55.75
CALCULATED PAY LIMIT INCLUDING PROFIT MARGIN (g/t)	4.65	4.41	4.43	4.39
MARGIN ON GRADE (g/t)	0.42	0.52	0.38	0.45
MINERAL LEASE FORMULA (PRE-1992)	1996.1	1996.2	1996.3	1996.4
LEASE RATE (Y = 15 - 90/X) %	4.16	6.49	3.63	5.32
LEASE PAYMENT (Rand)	19,695,273	41,009,041	17,719,554	32,484,432
PROFIT (Rand)	454,220,707	590,661,663	470,928,926	578,175,066
TOTAL COST/TONNE (R/t)	227.77	234.58	243.08	246.08
PRICE/GRAM (R/g)	48.81	52.81	54.71	55.75
CALCULATED PAY LIMIT (g/t)	4.67	4.44	4.44	4.41
IMPACT ON GRADE (g/t)	0.02	0.03	0.01	0.02
GOLD LOST AS A RESULT OF LEASE PAYMENT (g)	403,531	776,591	323,885	582,682
RESERVES LOST AS A RESULT OF LEASE PAYMENT (t)	86,470	174,816	72,895	132,009
CAWOOD ORIGINAL FORMULA	1996.1	1996.2	1996.3	1996.4
NET SMELTER REVENUE (0.8 X REV)	4,568,188,800	4,777,028,000	4,940,241,600	5,254,621,600
ROYALTY RATE (1 + X/50)	1.17	1.21	1.16	1.19
ROYALTY PAYMENT (Rand)	53,264,544	57,877,011	57,220,792	62,316,768
PROFIT (Rand)	420,651,436	573,793,692	431,427,689	548,342,730
TOTAL COST/TONNE (R/t)	229.22	235.32	244.77	247.30
PRICE/GRAM (R/g)	48.81	52.81	54.71	55.75
CALCULATED PAY LIMIT (g/t)	4.70	4.46	4.47	4.44
IMPACT ON GRADE (g/t)	0.05	0.05	0.04	0.05
GOLD LOST AS A RESULT OF CAWOOD ORIGINAL (g)	1,091,323.01	1,096,021.58	1,045,904.15	1,117,792.14
RESERVES LOST AS A RESULT OF CAWOOD ORIGINAL (t)	232,369	245,951	233,776	251,985
2008 ROYALTY ACT	1996.1	1996.2	1996.3	1996.4
REVENUE	5,710,236,000	5,971,285,000	6,175,302,000	6,568,277,000
ROYALTY RATE (Y = 0.5 + X/12.5)	1.16	1.35	1.13	1.24
ROYALTY PAYMENT	66,464,458	80,390,081	69,968,388	81,694,145
PROFIT (Rand)	407,451,521	551,280,622	418,680,092	528,965,353
TOTAL COST/TONNE (R/t)	229.80	236.30	245.31	248.10
PRICE/GRAM (R/g)	48.81	52.81	54.71	55.75
CALCULATED RECOVERY PAY LIMIT ALLOWING FOR ROYALTY ACT (g/t)	4.71	4.47	4.48	4.45
IMPACT ON GRADE (g/t)	0.06	0.07	0.05	0.06
GOLD LOST AS A RESULT OF ADJUSTED FORMULA (g)	1,361,773	1,522,353	1,278,910	1,465,369
RESERVES LOST AS A RESULT OF ROYALTY ACT (t)	289,232	340,202	285,224	329,280
P/R (%) Before Royalty Act	8	11	8	9
New P/R (%)	7	9	7	8

Source: COM South Africa gold mine quarterly statistics⁸⁶

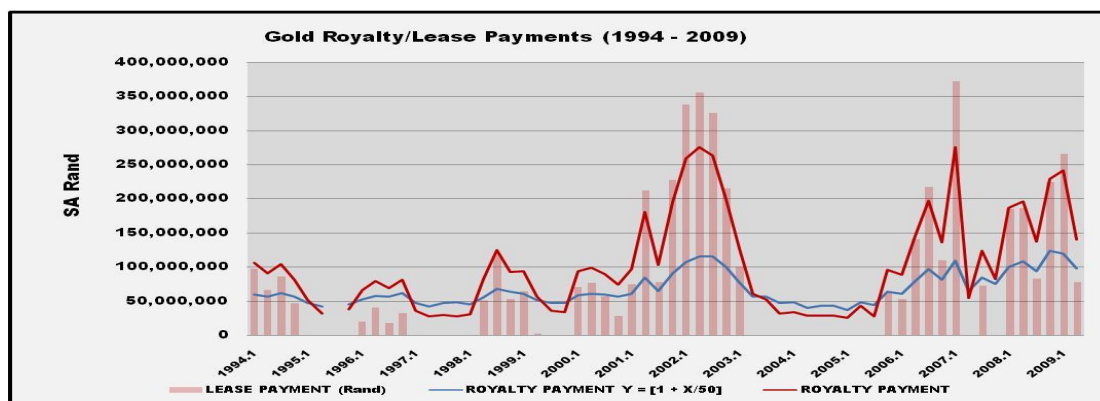
Impact on the royalty amount

The royalty amount is calculated for the three schemes over the 15 year period in order to establish the quarterly amount and the flexibility of the regime to respond to changing market conditions and more specifically, its efficiency in capturing economic rents. Figure 10 illustrates the impact over time, which reveals the following strengths and weaknesses of the three schemes:

⁸⁶ Available from www.bullion.co.za.

- The lease consideration is the most efficient for collecting rents during market upswings, but collects no royalty revenue for government during bad periods;
- The Royalty Act does not collect as much rents as the lease consideration, but government can rely on a continuous stream of revenues during market downswings. The average royalty rate over the 15-year period was calculated as 1.41%; and
- Although Cawood's formula allows for greater stability over time, its efficiency to maximise economic rents during times of high profitability could be questioned.

Figure 10 Impact of the Royalty Act in relation to other schemes



Source: COM South Africa gold mine quarterly statistics

Impact on gold industry profitability

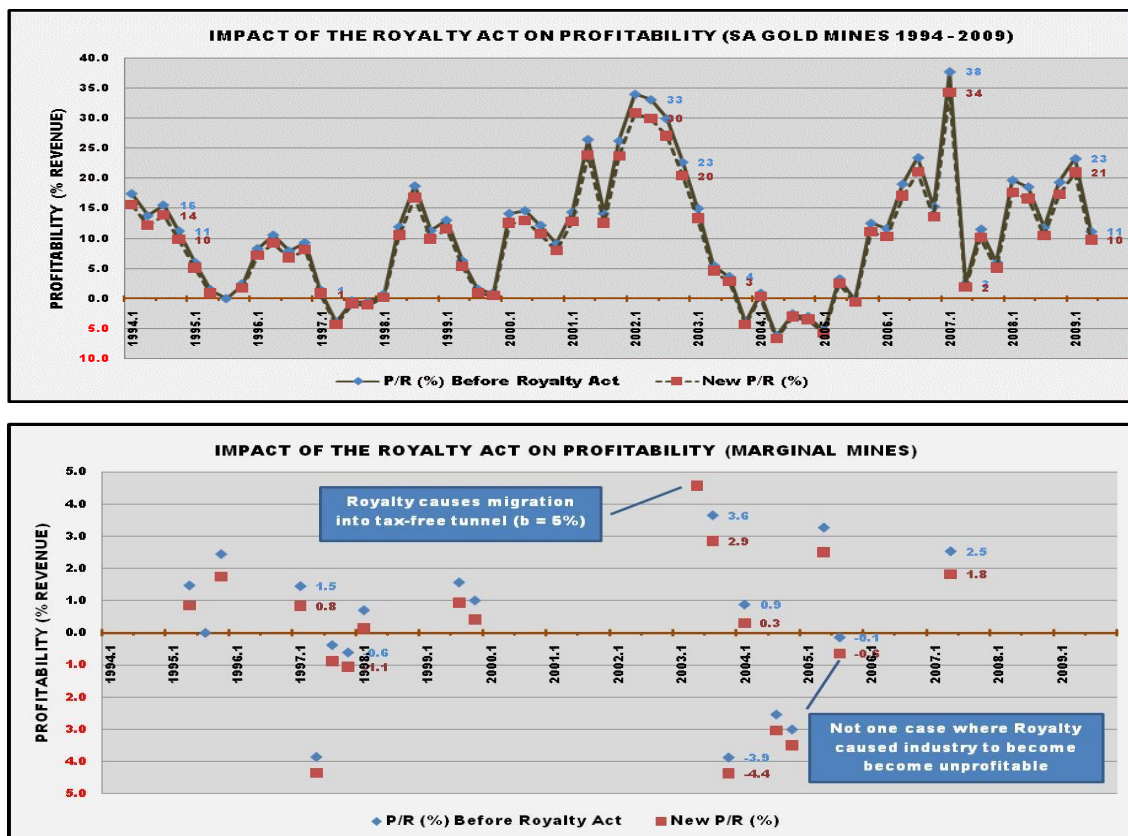
The approach for determining the impact of the royalty on profitability is similar to that taken earlier for other mines. The impact is illustrated in Figure 13, which compares the actual (combined) profitability (solid lines) for COM gold members against what the profitability would have been had the Royalty Act been in force (broken lines) for the past 15 years⁸⁷. The difference between the two lines can directly be attributed to the Royalty Act. Taxes cause the pay limit grade to increase in concert with a reduction in the margin shown in Figure 13. The second figure shows an enlargement of the

⁸⁷ The estimate for 2009 is based on its first two quarters.

marginal zone, i.e. where profitability ranged from minus 5% to plus 5%⁸⁸. The graphs illustrate the following points:

- Profitability ratios ranged from minus 6% to plus 38% over the period, which is indicative of the cyclic nature of the industry;
- As expected the impact of the royalty is significant during times of high profitability, while less significant during times of low profitability;
- The impact is minimal for marginal gold mines. Not once over the 15-year period the royalty caused a positive ratio to become negative; and
- It is possible for the royalty payment to cause the profitability ratio to drop below the 5% margin. This will cause the income tax rate to become zero for that quarter.

Figure 13 Impact of the Royalty Act on gold sector profitability



Source: COM Quarterly Statistics

⁸⁸ Five percent was selected because of the income tax formula provision, which allows for a tax-free tunnel of 5%. This means that when a gold mine is marginal and its profitability drops below 5%, it does not have to pay income tax despite being marginally profitable.

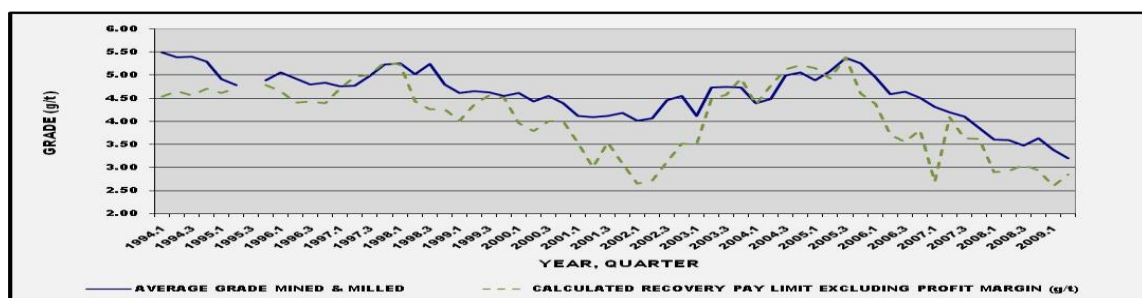
Impact on the mining pay limit

Determining the economic cut-off grade starts with the calculation of the mine pay limit, which was defined by Storrar (1981) as “...*that value at which it is estimated that ore can be mined without a profit or loss*”. For gold mines in South Africa, the pay limit is calculated as follows:

$$\text{Recovery Pay Limit in g/t} = \frac{\text{Cost in SA Rand per tonne milled}}{\text{Price in SA Rand per gram of gold}}$$

From the reported quarterly information, recovery pay limits were calculated using Storrar's approach. Once the required pay limit for recovered metal in the gold plant is known, the profit margin and technical mining factors⁸⁹ need to be considered in the estimate of the gold grade at the mining face. This situation has the effect that the actual mining grade is almost always higher than the calculated pay limit grade (Figure 11). The exception is for loss-making periods, which are due to the inelasticity of producers to respond to lower prices in the short run (e.g. 1997/98 and 2004/05). The figure also shows that this situation is corrected in the longer run and the expected time lag causes profitability margins (indicated by the gap between the two lines) to vary significantly over time. The average margin on grade over the 15-year period was found to be 0.48 grams per tonne⁹⁰.

Figure 11 Calculated pay limit grades versus actual grades mined



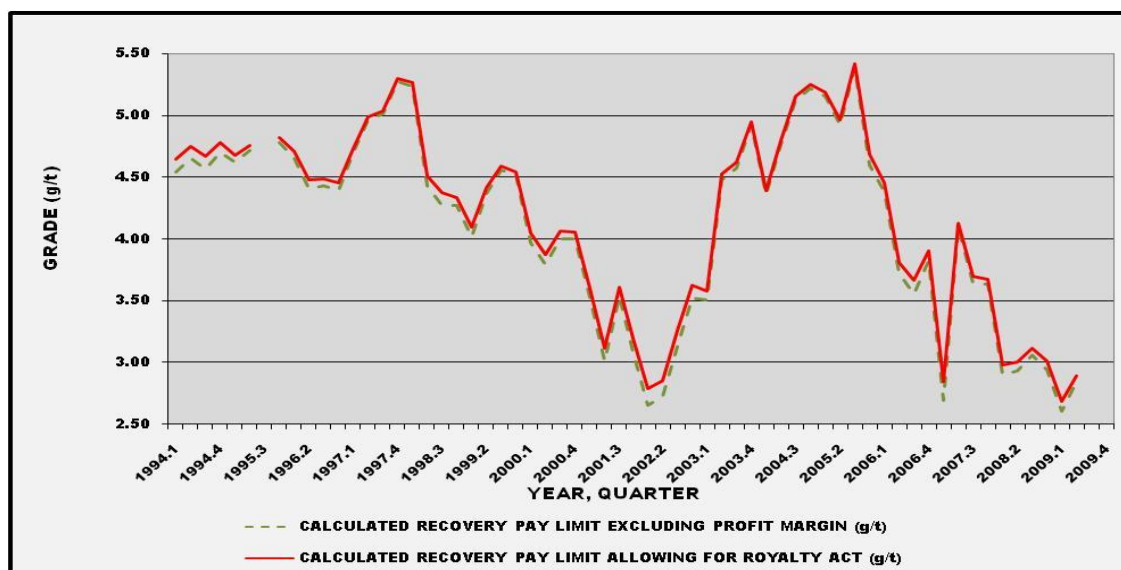
Source: COM Quarterly Statistics

⁸⁹ By means of a flow sheet calculation to account for plant inefficiencies, mining inefficiencies, underground dilution and losses during transport.

⁹⁰ Apart from known inelasticity of supply issues, the small margin shows commitment by the mining companies to avoid short-term high-grading strategies and a willingness to weather bad times in order to prolong mine lives and protect employment.

Figure 12 illustrates what impact the new Royalty Act would have had on the calculated pay limit if it were in force over the past 15 years. It shows that the impact of the Royalty Act is such that it causes the pay limit to rise, which means that it has a negative impact⁹¹. The average impact on the pay limit of 0.06 g/t appears to be insignificant but requires further and individual investigation for low grade gold mines.

Figure 12 Change in recovery pay limit caused by Royalty Act



Source: COM Quarterly Statistics

Impact on gold reserves

Reserves are defined in the SAMREC Code (2000) as:

“ the economically mineable material derived from a measured and/or indicated mineral resource. It is inclusive of diluting materials and allows for losses ... [and] ... modification by, realistically assumed

⁹¹ This was not the case with the old lease formula, which allowed mining profits even below the cut-off grade because of the lease-free provision. Although it cannot be disputed that the lease consideration formula had many benefits, its shortcoming is its unreliable stream of revenues to the State. This was illustrated in Figure 10. This fact led experts like van Blerck (2003) to propose the reintroduction of the lease consideration system as a solution to mineral royalties in South Africa.

*mining, metallurgical, economic, marketing, legal, environmental, social and government factors*⁹².”

Perhaps the best indicator for measured reserves is that portion of reserves that has been mined already, which implies that all legal, economic and technical factors have already been considered. Such an exercise combined with the new royalty caused the mining pay limit to rise by 0.06 g/t⁹³. The consequence of the rise in the pay limit is that 72 048 kg of gold would not have been mined from 1994 to date because their reserves would have become uneconomic. The scale of gold mining in South Africa is such that it dwarfs the portion of the reserves sterilised because of the Royalty Act. Considering that 5 284 879 kg had been mined for this period, the rise in the pay limit would have caused a reserve reduction of only 1.4%⁹⁴. Although this percentage seems insignificant and immaterial, it caused a destruction of value to the tune of ZAR6.6billion⁹⁵.

Impact on gold industry job losses

The next issue to consider is the impact of the Royalty Act on unemployment. Table 6 shows the significant correlation⁹⁶ between tonnes milled and employee numbers since 1996. If one applies the average employment per tonne milled of 0.0027 to the total of 18.8 million tonnes that had to be removed from the reserve statement as a result of the Royalty Act, it amounts to 50 897 workers actually employed during the review period, who would have been unemployed. An average retrenchment of 3 393 workers per

⁹² The new mineral royalty will typically be a government factor. One must appreciate that any tax impacts negatively on the mine pay limit and hence reserves; and SAMREC requires reporting of any changes that materially influence the reserve statement and hence its asset value. Materiality, according to the Code is achieved when “*A Public Report contains all the relevant information that investors and their professional advisors would reasonably require, and expect to find, for the purpose of making a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources and Mineral Reserves being reported on.*”

⁹³ By comparison, the lease consideration and Cawood's formula would have caused an increase in the pay limit of 0.05g/t and 0.04g/t respectively.

⁹⁴ By comparison, the lease consideration and Cawood's formula would have caused a decrease in reserves of 1.3% and 0.9% respectively.

⁹⁵ By comparison, both the lease consideration and Cawood's formula would have resulted R4.7billion value to be lost because of sterilized reserves.

⁹⁶ The correlation coefficient is 0.79.

annum may accounts for about 0.7% of the total annual employment⁹⁷ in the mining industry. Such job losses need to be compared with the gains in employment opportunities made possible by the government budget and its spending programmes made possible by tax revenues.

Table 6 Relationship between tonnes milled and employment

YEAR	TONNES MILLED	EMPLOYEES	EMPLOYMENT PER TONNE
1996	93724000	342439	0.0037
1997	93270000	322025	0.0035
1998	82874000	255164	0.0031
1999	86552000	222389	0.0026
2000	83956000	197537	0.0024
2001	82962000	176612	0.0021
2002	81422000	176090	0.0022
2003	68215000	167418	0.0025
2004	59702000	149004	0.0025
2005	49609000	137611	0.0028
2006	50345097	135205	0.0027
2007	53247800	140783	0.0026
2008	53146610		
AVERAGES	78228600	214629	0.0027
JOBS LOST BECAUSE OF 2008 ROYALTY ACT			-50897
CORRELATION BETWEEN TONNES MILLED AND GOLD MINE EMPLOYMENT		r =	0.79

Source: COM Quarterly Statistics

Summary statement on the impact of the Royalty Act

This study demonstrates that the new Royalty Act will have an impact on the economy, which impact could be summarised as follows:

- The calculated royalty income is sufficient to cover significant budget items like e.g. the national university budget;
- Mining taxes are expected to rise by about 50% after implementation of the Act in 2010;
- The impact of the royalty is significant during times of high profitability, while less significant during times of low profitability, which is what one would expect from an efficient royalty instrument;
- The average royalty rate for gold mines over the 15-year period was calculated as 1.41%. This would have caused mining pay limit to rise by 0.06 g/t, which appears to be insignificant. The increase in the pay

⁹⁷ According to DME statistics, the mining industry employed an average of 475 000 workers per annum over the review period.

limit would have caused a reserve reduction of 1.4%, which is immaterial from a reporting perspective⁹⁸. Such reduction in reserves would have caused an average retrenchment of 3 393 workers per annum; and

- The gold sector investigation questions the equity of the new Royalty Act. The value of the royalty over the corresponding period is R6.2billion and if the 'costs' of the royalty is considered in terms of revenue lost, it represents a net loss for the country of R0.4billion⁹⁹.

MEASURING THE ACT AGAINST STANDARD ECONOMIC PRINCIPLES

Economists have developed international standards to evaluate tax regimes. Otto (1997) observed that the principles of a measuring the 'goodness' of a taxation regime apply equally to mineral royalties, i.e. the royalty should be efficient, neutral, stable, fair, clear and allow for sustainable development of mineral resources¹⁰⁰. Table 7 summarises the results of the exercise. The overall finding is that there are more positive than negative aspects associated with the new mineral royalty regime. If one were to make an educated guess on its goodness one has to conclude that most investors will be comfortable with most of the requirements of the Act for most of the time. This is not to say that they will find it acceptable, because some of the peculiarities like e.g. adjustments to gross sales value will unnecessary raise the cost of compliance.

⁹⁸ However, SAMREC requires a company to do the necessary adjustments when conditions change. Although a detailed report will not be necessary, a general comment that explains the downward adjustment would be appropriate in the Competent Person's report.

⁹⁹ This calculation suggests that the value destroyed is not covered by the benefit of the royalty going to the fiscus. Another concern is that although an increase in the pay limit is not critical for already developed high-grade mines, the impact would be significant for mines that are already operating on or close to the average grade of their reserves. For mines that do not have ready-developed high grade reserves in stock, it would mean premature closure. These concerns underline the fact that a revenue-based royalty is perhaps not appropriate for a country that cannot afford job losses in a labour intensive gold mining industry.

¹⁰⁰ These principles are idealistic and political pressure to maximise tax revenue makes it unlikely that any tax will meet all criteria.

Table 7 Strengths and weaknesses of the Royalty Act

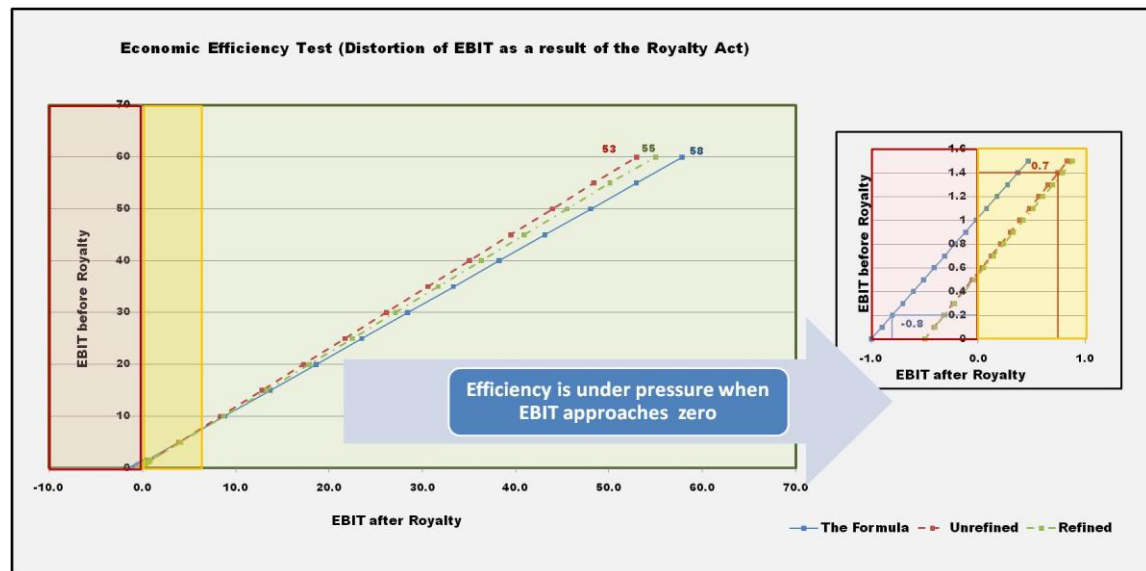
Criterion	Finding	Comment
Efficiency	✓	Some distortion of EBIT. It appears to be minimal - even for marginal and loss-making mines
Neutrality	×	The royalty base is gross sales, which could be further adjusted to meet minimum specified requirements
Equity	✓	Equitable allocation of royalty burden among 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

Economic efficiency

An efficient tax is one that collects revenue for the government without significantly affecting the behaviour of the pertinent economic actors or distorting economic activity. This implies that the tax is neither so high that it will reduce the level of activity nor excessively generous. Bradley (1986) cautioned that care must be taken to avoid economic distortion caused by gross sales royalties and observed that the royalty becomes inefficient when it impacts on the optimal production profile. The previous section concluded that there is insignificant distortion of EBIT and the pay limit if the royalty regime is added to past reported results, which makes it efficient using Bradley's interpretation. This is further illustrated in Figure 13, which explores the relationship between EBIT before and after the royalty. The figure shows the efficiency in collecting more revenue at high EBIT ratios. The insert on the right hand side is an enlargement of the relationship between the two EBITs at marginal and loss-making ratios. It demonstrates that the Royalty Act causes a marginal 1.4% EBIT before the royalty to be reduced 0.7%. For a loss-making operation, EBIT will be reduced by the minimum rate of 0.5%.

Despite this negative impact it would be unfair to blame the Royalty Act as the cause for a mine to become unprofitable.

Figure 13 Distortion of EBIT as a result of the Royalty Act



Neutrality

When a tax is neutral it will not result in altering decisions on which projects within the industry are undertaken and which are not. It should also not affect mine design parameters. A tax is perfectly neutral when aimed at economic rent, which will also make the tax more efficient. However, political pressure to maximise revenues, sovereignty over natural resources and fiscal instruments to protect local industries cause governments to design non-neutral regimes. Political pressure to introduce gross sales royalties pushed the Royalty Act away from tax neutrality. The insistence on a revenue-based royalty and the insignificant allowable deductions in the computation of gross sales could prove problematic in the future – especially if gross sales are adjusted upwards for marginal and loss-making mines.

Equity

Equity means fairness, which must consider both ability to pay and benefit-related principles. This concept of utility maximisation, a tax that gives greatest satisfaction to a large number of parties, then becomes the main criterion for measurement purposes. The paper illustrates that most mineral producers would be able to afford the royalty and there is an equal burden for different mineral products across the industry. In the author's view there is a fair balance in the Royalty Act in terms of equity – both in respect of balancing government and investor interests and applying the same formulae consistently on all mineral types and products.

Stability

This standard wants to prevent frequent adjustments to the royalty rate and base (Otto, 1997). The likelihood that a fiscal regime will remain unchanged depends on two factors, i.e. the stability of government policy and the flexibility of the regime to accommodate sudden and unexpected changes in the project economics. This is particularly important during the project's payback period. States can achieve stability by introducing either sliding-scale instruments or FSAs¹⁰¹. The Royalty Act contains both these measures and although the rate will change annually, the parameters of the formulae cause certainty for forecast purposes.

Clarity

The standard of clarity requires non-arbitrary administrative rules that are clearly understood by both government administrators and investors, which relates to the ease of administering the royalty and the transparency of the

¹⁰¹ FSAs are available in countries like Chile, Indonesia, PNG and Peru. FSAs could be successful if structured favourably to both State and investor. Stability can also be achieved by defining rates in Law, but the law-making process is too slow to respond satisfactorily to rapidly changing market conditions.

entire royalty regime. Smith's (1776) description of clarity is still relevant today, namely *"...The tax which each individual is bound to pay ought to be certain, and not arbitrary. The time of payment, the manner of payment, the quantity to be paid, ought all to be clear and plain to the contributor"*. While the simple structure of the formula means that administration should be easy, the complex wording of the Act and the provision for adjustments by SARS will unnecessarily raise compliance costs for companies.

Sustainability

This standard requires measures to sustain the business. This could be done through a number of provisions, for example making it possible to reinvest profits to fund expansions¹⁰² and to allow deduction of exploration expenses funded from mining profits¹⁰³. The Royalty Act allows for exploration costs to be deducted for the purpose of EBIT, while the ITA allows for the deduction of exploration costs in the income tax calculation. The allowance for prospecting in the royalty regime is therefore considered adequate. In addition to this the Royalty Act makes provision for exemptions, reliefs and credits for the purpose of reducing or waiving the royalty due to the State¹⁰⁴.

THE ACT'S POLICY INTENT OF PROMOTING VALUE ADDITION

In addition to the standard economic criteria mentioned in the previous section, it is necessary to include a criterion that is very important in the South African context. This is the policy intent of motivating mineral producers to add so much value to production so that the sales product could meet the Royalty Act's definition for a refined mineral resource. As reward for this value-addition, producers will pay according to the formula that will cause the royalty rate to be reduced to a maximum of 5%. This section explains a method to judge whether or not the carrot of a reduced rate is sufficiently

¹⁰² These are credits for expenses reinvested.

¹⁰³ These include generous provisions for the treatment of exploration costs, e.g. uplifts, immediate deduction of new capital programmes and large ring fences.

¹⁰⁴ These are the small business exemption (Section 7), exemption for sampling (Section 8) and rollover relief upon disposals (Section 9).

attractive to encourage mineral producers to spend the additional money on value-addition. Bradley (1986) identified that the following issues need to be considered when developing royalty instruments that promote value-addition to minerals:

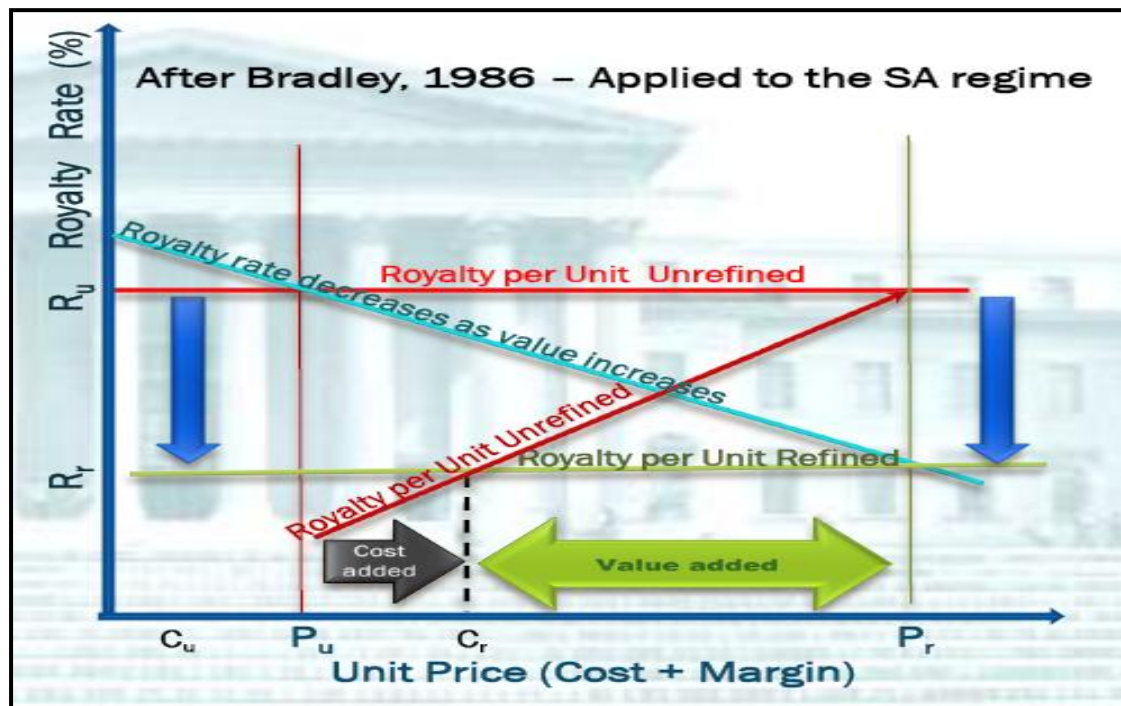
- Different minerals require different amounts of processing before sale;
- The value added per unit cost is not the same for all minerals;
- The royalty on processed products must target mine-head value, which could be calculated by subtracting processing costs from the value established at the point of sale (i.e. netback or NSR calculation); and
- As an alternative to a netback calculation, a schedule of rates according to different levels of processing can be specified¹⁰⁵.

Bradley's scheme is illustrated in Figure 14, which depicts the situation where royalties are assessed at the refined stage, as is the case with the Royalty Act. Bradley's relationship between royalties and value-addition is based on the Western-Australian system of royalties, which is an attempt to target mine-head value where the royalty rate is fixed and linked to a certain level of beneficiation. The bottom line is that a low royalty rate for refined minerals (e.g. $R_r = 2.5\%$) gives the same royalty income when a high rate is applied to mine-head value (e.g. $R_u = 10\%$). The result is a negative relationship between the royalty rate and unit price (light blue line in the figure). Value-addition costs are justified when the increase in unit price less royalty 'savings' as a result of the reduced rate are greater than the additional costs (Cr indicated by the black arrow) incurred to get the production to a refined state. The value added (green arrow) is then the difference between the price received and the total cost required to bring production to its desired state of beneficiation. The policy objective is achieved when the unrefined rate shifts down to the refined rate (as illustrated by the blue arrow to the point R_r on the vertical axis). It is beneficial (economical) to the company when *first*, there is

¹⁰⁵ The Western Australian royalty system uses this approach. It is based on the assumption that ex-mine value is 25%, ex-crushing and screening is 33% and concentrate is 50% of refined value. These values were calculated from average unit costs (or value added) by stage of processing. This approach causes royalty rates that are scaled downward with successive stages of processing until the refined stage is achieved.

an intersection between the red line joining the refined and unrefined royalty rates, and *second*, such intersection occur somewhere between P_u and P_r (C_r in the illustration).

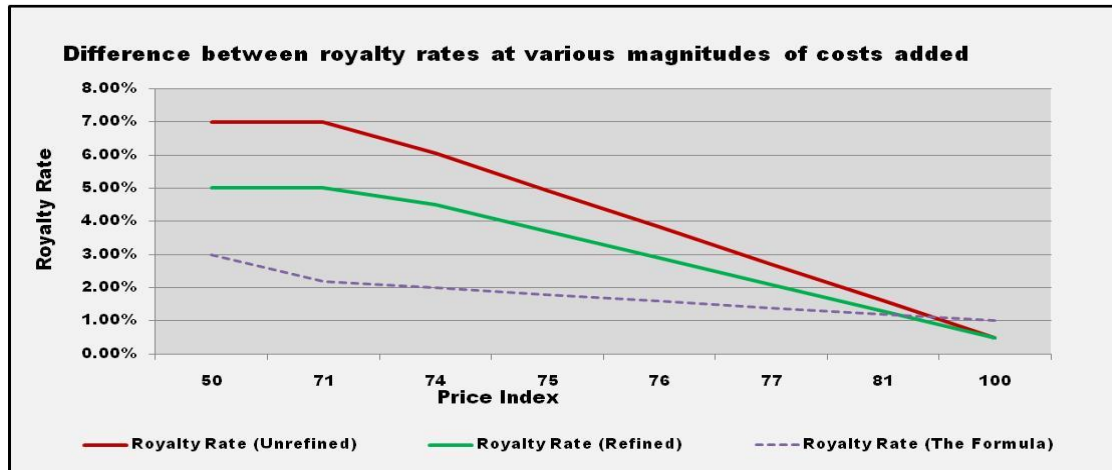
Figure 14 Relationship between royalty rates and value-added costs

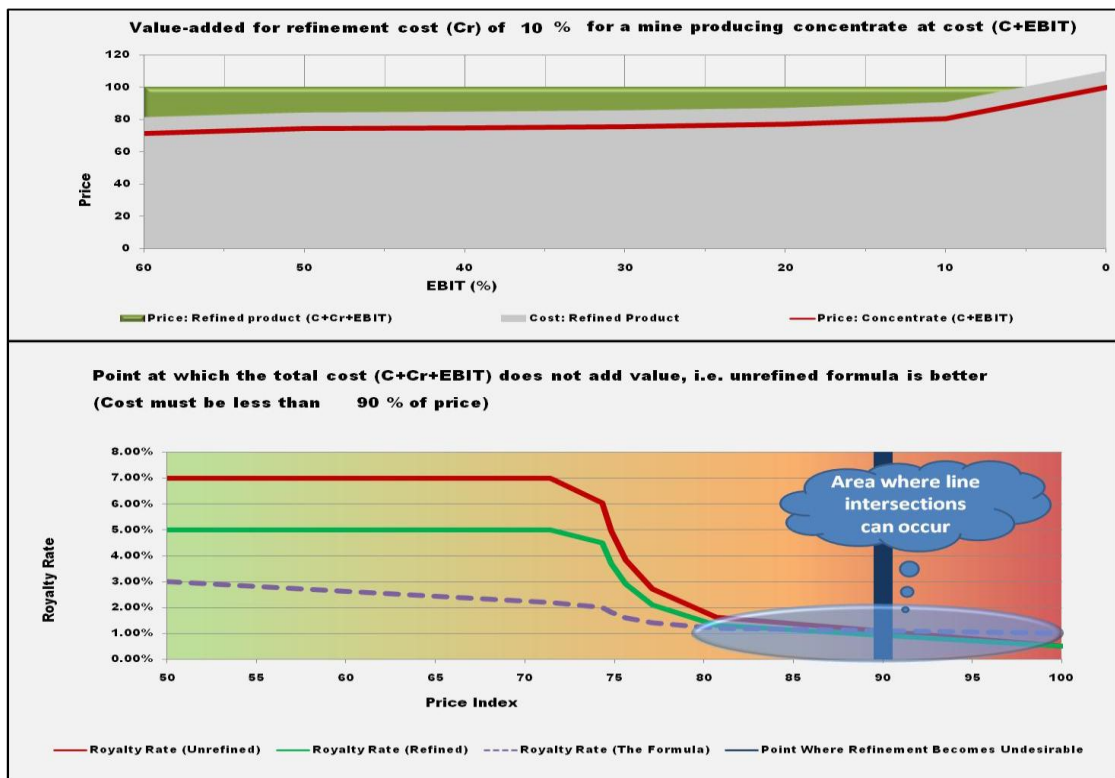
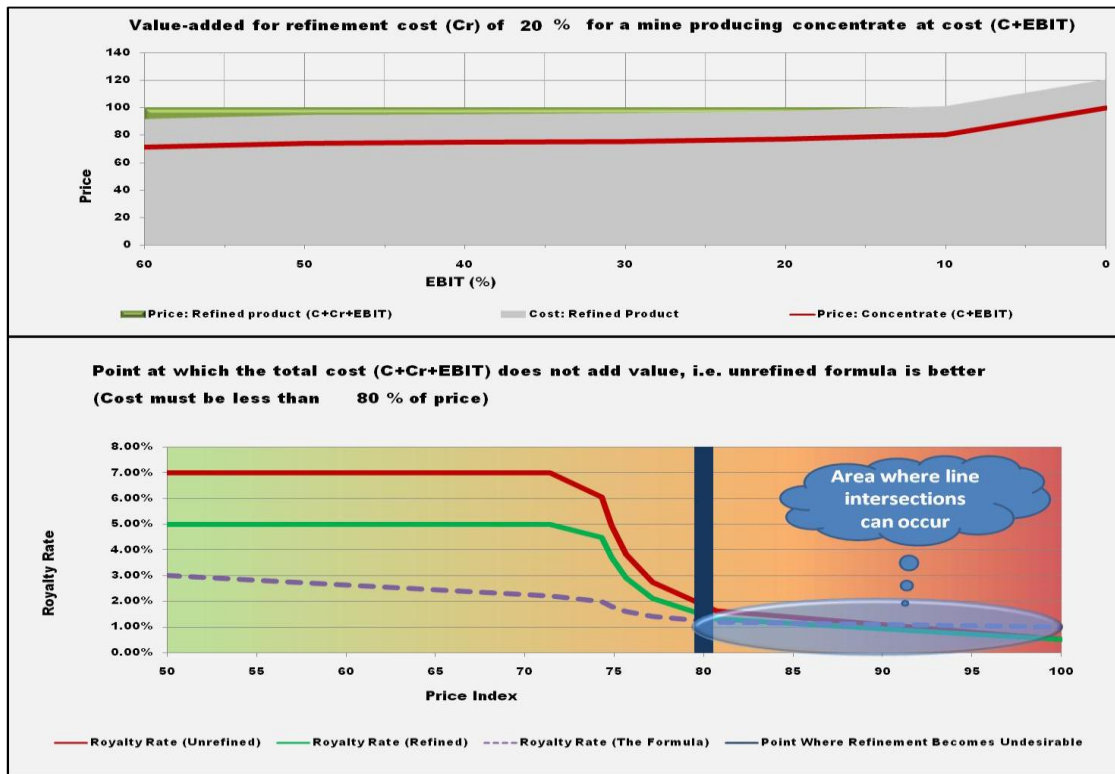


When one wants to apply Bradley's relatively simple approach of having fixed royalty rates versus specified levels of beneficiation to the South African system, there are several problems to overcome. The most important are the impacts of EBIT and the dual formula system, which causes the lines to intersect at the minimum royalty rate when maximum costs are added (i.e. an index price of 100). This is illustrated in Figure 15. Because the lines are not parallel as is the case in Figure 14, the incentive to beneficiate becomes greater, as determined by the area available for a clear intersection, when there is a large difference between the maximum rates of the formula. This is illustrated by the addition of Cawood's formula to the graph, which has a maximum of 3%. The formula system therefore poses a challenge to in that the lines are no longer horizontal and to make things worse, the smaller the difference between the maximum rates the more parallel the lines are. This reduces the opportunity to get a clear intersection and maximum value-added

opportunities. To conclude, Figure 15 illustrates that the formula approach requires a significant difference in maximum rates to avoid the lines becoming too parallel to cause a clear intersection.

Figure15 Relationship between royalty rates and sales price





CONCLUSION AND OPINION ON THE ACT

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ARRANGEMENT OF SECTIONS

ROYALTY ACT

1. Definitions
2. Imposition of royalty
3. Determination of royalty
4. Royalty formulae
5. Earnings before interest and taxes
6. Gross sales
7. Small business exemption
8. Exemption for sampling
9. Rollover relief for disposals involving going concerns
10. Transfer involving body of unincorporated persons
11. Arm's length transactions
12. General anti-avoidance rule
13. Conclusion of fiscal stability agreements
14. Terms and conditions of fiscal stability agreements
15. Foreign currency
16. Transitional credits
17. Act binding on State and application of other laws
18. Short title and commencement
- Schedule 1
- Schedule 2

ROYALTY ADMINISTRATION ACT

- Part 1 Interpretation
1. Definitions
- Part II Registration
2. Registration
 3. Cancellation of registration
 4. Election for unincorporated body of persons
- Part III Payments and returns
5. Payments in respect of estimated royalty
 6. Submission of return and final payment
 7. Form, manner and place determined by Commissioner
 8. Maintenance of records
- Part IV Assessments
9. Notices of assessment
 10. Reduced assessments
 11. Withdrawal of notice of assessment
 12. Time limit for notice of assessment
- Part V Refunds, penalty and interest
13. Refunds
 14. Penalty for underestimation of royalty payable
 15. Adjustments of estimated royalty
 16. Interest
- Part VI Miscellaneous
17. Administration of Act
 18. Applicability of Income Tax Act
 19. Reporting
 20. Regulations
 21. Short title and commencement

Readily saleable condition**SCHEDULE 1****REFINED CONDITION OF MINERAL RESOURCES**

Mineral resource name	Refined condition
Cobalt	Cobalt is refined once processed into cobalt metal or cobalt sulphate. 99.5 % refined
Copper	Copper is refined once processed into copper metal slabs, blister copper or cathode copper of at least 99.0 % purity.
Germanium	99.99% refined product
Gold	Refined and smelted to a 99.5 % purity
Lead	Lead is refined once processed into bars and billets containing at least 99.0 % pure lead.
Lithium	99.5% LiCO ₃ in concentrate (lithium carbonate)
Mercury	99.9% purity
Nickel (Base metal)	Nickel is refined once processed into a metal, or other form (e.g. ferro nickel, nickel metal or nickel sulphate). 99.5% purity
Platinum Group Metals (iridium, palladium, platinum, rhodium, ruthenium and osmium)	Refined and smelted to a 99.9 % purity
Molybdenum	99.99% refined product
Silicon	98.5% Si
Silver	Silver is refined once processed to silver metal or silver nitrate. 99.5% refined
Talc	98.5% and minus 325 µm mesh
Zinc	Zinc is refined once processed into zinc metal, plates or slabs containing at least 98.5 % pure zinc.

Oil and Gas

Oil	At inlet of refinery
Gas	At inlet of refinery

Readily saleable condition SCHEDULE 2 UNREFINED CONDITION OF MINERAL RESOURCES	
Mineral resource name	Unrefined condition
Aggregates	Bulk
Antimony	85% Sb content in the concentrate
Barite	Concentrates with 97% BaSO ₄
Beryllium	70% beryl concentrate
Chromium in lump, chip or fine	(i) 34% to 46% Cr ₂ O ₃ in concentrate; (ii) 4% to 10% SiO ₂ and a (iii) Cr/Fe ratio of 1.3 to 1.15 (chip and lump) or (iv) 0.8% to 6% SiO ₂ and (v) Cr/Fe ratio of 1.3 to 1.6 (fine < 1mm)
Clay used for bricks	Bulk
Kaolinite clay used by paper and ceramic sectors	
Coal	<u>Grade A:</u> in situ calorific value equal or greater than 27.5 GMJ/kg <u>Grade B:</u> in situ calorific value equal or greater than 26.5 GMJ/kg and less than 27.5 GMJ/kg <u>Grade C:</u> in situ calorific value equal or greater than 25.5GMJ/kg and less than 26.5 GMJ/kg <u>Grade D:</u> in situ calorific value less than 25.5 GMJ/kg
Cobalt	7% Co in a polymineralic matte
Copper	20% to 30% Cu
Diamond	Rough Diamonds
Dimension stone: Granite, Sandstone, Slate, Shale, Gneiss, Marble	Bulk
Fluorspar	80% concentrate
Graphite	86% carbon content
Iron	61% to 64% Fe content
Lead	Concentrate with a minimum of 50% Pb
Limestone	Concentrate with a minimum of 54% CaCO ₃
Manganese	Manganese ore: Mn 48% and Si + Al less than 11%
Mica	48% concentrate
<u>Mineral Sand (Titanium)</u>	
Ilmenite	(43% to 50% TiO ₂ in ilmenite) concentrate grades – ilmenite % content
Rutile	80% TiO ₂ Rutile concentrate
Zircon	85% ZrO ₂ Zircon concentrate
Nickel	1.4% Ni content
Niobium	45% Ni ₂ O ₃ in concentrate
Platinum Group Metals (Iridium, palladium, platinum, rhodium, ruthenium and osmium)	concentrate (150 ppm)
Sand	Bulk
Silver	800g/t Ag in polymineralic base metal
Tantalum	In concentrate 30% Ta ₂ O ₅ , Max 0.5% U ₃ O ₈ and ThO ₂ combined
Tin	80% cassiterite concentration
Tungsten (CaWO ₄) and Wolfram	Minimum 65% WO ₃ in concentrate
Uranium	80% uranium in concentrate. Oxide (yellow cake) and Uranium Hexafluoride.
Vanadium	Concentrate > 1% V ₂ O ₅ equivalent and less than 2% calcium and silica bearing gangue minerals (SiO ₂ + CaO)
Zinc (Base metal)	27% Zn in concentrate
Other Minerals not listed elsewhere	Concentrate or bulk. e.g. Phosphate Rock, Vermiculite, Semi-precious gemstones (like rose quartz, tiger's eye; corundum; etc), Precious gemstones (like sugilite), Feldspar, Garnet, Peat, Perlite, Rare Earth Elements, Silica, Soda Ash, Wollastonite, Zeolite, etc.

Limestone amended in 2009 (54 - 90%)

