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# Issues in Australasian Mining Taxation: The Arguments For and Against Resource Rent Taxation

Graeme E Hancock<sup>1</sup> and A D Stewart Gillies<sup>2</sup>

## ABSTRACT

Resource rent taxation systems are based on the concept that the resource owner or government should receive a proportion of the economic rent or surplus profit generated by a primary productive activity. Economic rent has been defined as additional profits in excess of the minimum rate of return necessary to attract new investment into an industry sector.

Resource rent taxation schemes for the mining industry have been widely discussed and in some cases implemented over the past 20 years. The main objective of resource rent taxation has been to implement a royalty or taxation system which gives to government a higher return from more profitable mines without adversely affecting marginal mines or inhibiting investment in new mines.

The structure of resource rent taxation systems is discussed, with particular emphasis on the parameters of accumulator rate, tax or royalty rate and deductible expenses. The application of the tax is examined by looking at the case in favour for imposition from the viewpoint of the Resource Owner (government) and the mine operator. Likewise, the case against this system is analysed from the tax collector's (government or governments) point of view and that of the mine operator.

It is concluded that neutrality of the tax on investment decision-making may be compromised when the possible negative effects on exploration and research and development and their impact on overall mining company performance are considered. Any application of the tax on existing operations is likely to be complex and costly for both governments and companies. However, successful application to greenfields developments has been demonstrated in Papua New Guinea.

## INTRODUCTION

Resource rent taxation (RRT) otherwise known as Additional Profits Tax (APT), Surplus Related Royalty (SRR) or Resource Rent Royalties (RRR) are taxation systems for the mining industry designed to tax the economic rent or super-normal profit generated from a mining operation. Economic rent has been defined as profits that remain after the deduction of company income at a level which corresponds to the minimum return necessary to attract private investment into a new project in that industry sector (Garnaut and Clunies Ross, 1975, 1983). Resource rent taxation has been described as a 'neutral' tax which should return to the resource owner either a proportion or all of the surplus profits generated from a primary industry which are derived as a result of the inherent quality, grade or accessibility of the deposit. The objective of all resource rent systems is to maximise the level of tax collected without discouraging new investments in the mining industry.

Resource rent taxation systems have been the subject of considerable discussion within government, industry, and academic circles for the last two decades. To-date RRT systems have been applied in the Papua New Guinea mining and petroleum taxation legislation, to the Australian Offshore Petroleum industry, and the Roxby Downs venture. The Industries Assistance Commission and the Australian Bureau of Agricultural and Resource Economics (ABARE) and the Industry Commission have to-date released several documents discussing RRT and recommending a form of RRT for implementation in the Australian mining industry. Since publication of the Garnaut and Clunies Ross paper on RRT in 1975 almost every review of the Australian mining taxation system has made reference to RRT as a possible and potentially attractive taxation option.

The Industry Commission in its 1991 report on Mining and Minerals Processing in Australia made the following recommendation to the Commonwealth Government concerning the introduction of resource rent taxation in replacement of existing royalty systems:

*Recent moves to adopt royalty systems which incorporate a profit-based element be taken to their logical conclusion of charging pure-rent based royalties, to apply to metallic minerals and coal.*

Such proposals to introduce resource rent taxation in Australia have generally met with a negative response from the mining industry. This paper is an attempt to outline some of the major arguments raised in the literature both for and against the introduction of resource rent taxation. As always the perspective of the desirability of a taxation system depends whether one is a tax collector or tax payer. It is hoped that this paper presents a balanced view.

## THE FUNDAMENTALS OF RESOURCE RENT TAXATION SYSTEMS

Resource rent taxation is a form of royalty or tax which begins to operate only at such a time as a threshold rate of return has been realised by a mining operation. Assessment of tax liability requires the accumulation at specific interest rates of all payments and receipts in respect of the establishment and operation of a mining project. At such a time as the accumulated revenues exceed the accumulated costs the tax becomes effective at a prescribed rate. The tax will continue to be levied until such time as a negative cashflow occurs. This may occur as a result of the mine operating at a loss or through new capital expenditure.

Resource rent taxes comprise three primary components:

### Process mineralogy

- Assessment of ores and mill products
- Mineralogical composition
- Liberation/locking
- Element distribution among minerals
- Metallurgical interpretation of mineralogical data.

### Further information:

Dr Keith Henley or Frank Radke  
Phone: (08) 372 2883



1. Postgraduate Student.
2. Senior Lecturer, Department of Mining and Metallurgical Engineering, University of Queensland, St Lucia.

1. The accumulator rate, otherwise known as the discount rate or threshold rate.
2. The tax or royalty rate.
3. The deductible expenses.

## Accumulator rate

The accumulator or threshold rate is a risk adjusted interest rate fixed by the government or through negotiation during the mining agreement phase. The rate is established at a level sufficient to compensate the company for the opportunity cost of investing in a riskless venture with an added premium to compensate for the risk of investing in the natural resource sector. Accumulator rates may vary from commodity to commodity and from place to place depending on the perceived level of risk and the required rate of return necessary to attract new investment into that particular country or industry sector. The rates are usually set at a rate to compensate for the non-deductibility of failed exploration from outside the lease area. A summary of the rates currently in use appears in Table 1.

## Tax or Royalty Rate

Once a project has reached a position where accumulated (discounted) revenue exceeds the accumulated (discounted) costs it is said to have achieved a net positive cashflow. At this point tax or royalty is paid at the prescribed rate. In a pure RRT example the rate would be applied at a fixed rate to all profits in that year. In composite tax schemes such as Papua New Guinea, the tax rate applicable after the threshold is reached is calculated using the formula  $(70-N)$  per cent where  $N$  is the normal company tax rate applicable at the time. With a current company tax rate of 35 per cent for mining companies the effect of RRT is to increase marginal tax rates to 57.75 per cent. In the Australian petroleum taxation system the RRT is applied at a fixed rate of 40 per cent on after tax cashflow. If a company is paying 39 per cent company tax the effective marginal tax rate including RRT increases to 63.4 per cent. With these formulae, company tax rate increases also result in increases in the marginal rate after RRT. In the PNG system the fixed formula for calculation of the RRT rate is less affected by changes in company tax rates than the Australian example. For example, the PNG

company tax rate would need to increase to 58.8 per cent before the current marginal rate applicable in Australia of 63.4 per cent would be reached.

## Deductible expenses

RRT provides for the deduction from receipts of expenditures incurred in the establishment and operation of a mining operation including exploration costs. The exception to this is interest payments for debt servicing which are non-deductible. It allows for capital expenditure to be completely written off in the year it is incurred and treated as if it were a current or operating cost. RRT is usually applied on a project by project basis rather than company wide. This ring-fencing of projects serves to limit the deductibility of exploration and development expenses from outside a specified area which would usually be defined as the immediate mine lease.

In summary the operation of RRT schemes in their simplest forms are similar to that of company taxation with the following differences:

1. RRT is normally paid on a ring-fenced individual project basis rather than a company wide basis.
2. Discounting (accumulation) of project receipts and expenditures occurs at a prescribed interest rate with the tax becoming effective only after a threshold rate of return is exceeded.
3. All capital expenditures are immediately deductible at 100 per cent in the year of purchase and treated as current or operating expenditures.

**TABLE 1**  
**Resource Rent Taxes in Australasia.**

**PNG Mining RRT:** Threshold rates either 20 per cent or the United States AAA long-term commercial bond rate plus 12 per cent, at the once only choice of the operator. Tax rate  $(70-N)$  per cent where  $N$  = normal mining corporate tax rate currently 35 per cent. Effectively a marginal rate of 57.75 per cent. Based on life of project internal rate of return.

**Bougainville Copper Mining Agreement** (operations currently suspended): Threshold rate 15 per cent. Tax rate variable from normal mining corporate rate to 70 per cent maximum marginal rate. Based on annual rate of return on funds employed.

**PNG Petroleum RRT:** Threshold rate 27 per cent. Corporate petroleum tax rate 50 per cent. RRT Tax Rate 50 per cent on after corporate tax income, effectively a marginal rate of 75 per cent. Based on life of project internal rate of return.

**Australian Offshore Petroleum:** Threshold rate Commonwealth long-term bond rate plus five per cent with full exploration loss offsets. Tax rate 40 per cent on after corporate tax income, effectively a marginal rate of 63.4 per cent. Based on life of project internal rate of return.

**Barrow Island Petroleum:** Threshold rate Commonwealth long-term bond rate plus 15 per cent with revenues split 75 per cent : 25 per cent between the Commonwealth and West Australian State Governments respectively. Tax rates as per Australian Offshore above. Based on life of project internal rate of return.

**Roxby Downs Operating Agreement:** Threshold rate 1.2 times the Commonwealth long-term bond rate. Variable tax rate depending on level of profitability from 0 - 15 per cent on after corporate tax profits. This is a State Government royalty not Commonwealth. Based on annual rate of return on funds employed.

## Flotation testing

- Flotation of sulphides
- Flotation of industrial minerals
- Controlled potential sulphidisation (CPS)
- Pilot-scale conventional and column flotation
- Specialised flotation systems
- Jameson cell

### Further information:

Geoff Dunlop or Gary Chibnan  
Phone: (08) 416 5200





4. Unlimited carry forward of accumulated losses occurs at the prescribed interest rate.
5. No deduction is allowed for debt interest payments from taxable income.
6. No tax or royalty is paid until a specified threshold rate of return on the project is achieved.

## THE CASE IN FAVOUR

### THE VIEW OF THE RESOURCE OWNER

In most nations mineral resources are the property of the Federal or State Governments and are in a sense community property. The existence of resource deposits which are of very high quality or easily accessible results in some mining operations with profitability levels in excess of that required to attract investment into resource developments. It is the view of governments that if a mineral resource is exploited and generates a high return on investment, then the community is entitled to receive a fair return or price for its resources.

The primary objective of the resource owner (which is most commonly a state or national government) is to extract the maximum possible revenue from any mining venture for the benefit of tax-payers as a whole. A careful balancing act is required to achieve this objective by maximising tax revenue without killing the goose that lays the golden egg, that is, scaring off investment in the industry as a whole. Garnaut and Clunies Ross (1975) proposed resource rent taxation as a form of taxation designed to be neutral with respect to investment decision-making. Neutrality implies that the tax system must not have any effect on the return to the investor until the investor is satisfied that a better return would not be achieved elsewhere. The primary feature of RRT is that the tax does not become effective until a rate of return sufficient to attract new investment has been achieved. Put another way the tax only affects super profit (economic rent) in excess of market expectations of return on investment. This tax neutrality is seen as the major positive element for the introduction of such a tax as only highly profitable mines would pay RRT while marginal or less profitable mines would not be burdened with additional taxes.

In many developed countries the existing tax structures along with a host of federal and state charges are usually the legacy of a long-time period of changing policies and often lack cohesion and consistency. When combined with production based specific or *ad valorem* royalties the existing tax structures are insensitive to either costs or profitability. Production based royalties result in increases in direct operating costs and serve to increase the risk to investors particularly with respect to marginal prospects. Any factor which increases risk ultimately results in lower levels of mineral resource development taking place. The attraction of RRT is that the operators risk due to the application of cost insensitive royalties is reduced and the operator will only be levied royalties after a guaranteed rate of return is achieved. This lowered level of risk should therefore result in increased mineral resource development.

A further point in favour of RRT is the effect of the tax on the utilisation and conservation of mineral and petroleum resources. The ring-fencing of projects for tax purposes results in companies examining ways to reduce their tax liabilities through investment in exploration and considered development within their existing leases. This can have the following possible beneficial effects.

1. Companies undertake capital investment to improve their operations in the knowledge that this investment will reduce or prevent their RRT liability. This can be achieved through the introduction of new and efficient technologies for further utilisation of the existing resource base. This was noted as one of the benefits of the Australian Offshore Petroleum legislation where expenditure on tertiary recovery techniques was expected to increase as a result of RRT.
2. Increases in exploration within ring-fenced leases can be expected to increase recoverable reserves due to exploration expenditure being deductible under RRT.
3. Mining companies are able to manipulate their average grades to achieve a desired rate of return through control of the average ore grade entering the mill. With the large differential between tax rates applicable before and after the RRT

threshold is achieved, it is anticipated that profitable companies may attempt to maintain rates of return at levels just below the tax threshold in order to avoid paying the extra tax. This can be achieved by lowering cut-off grades to include material as ore which would otherwise have been dumped as waste.

Any of these courses of action by the mine operator result in an increase in the utilisation of the *in situ* resources with a corresponding increase in the life of the ore body and hence the extractive industry itself.

Expenditure on environmental protection or rehabilitation can also be undertaken to reduce the likelihood of RRT liability.

### THE VIEW OF THE OPERATOR

Mine operators will only welcome a new tax if it is perceived to reduce the overall costs to the business or the level of business risk. It is difficult to expect any business to welcome any additional tax being levied over and above those already in existence.

In its pure form RRT can be a very attractive tax alternative as no tax is payable until the business has achieved payback and a prescribed rate of return. Application of such a pure taxation system can result in significantly less risk to the operator than the tax structures currently in use in Australia. However there are no pure RRT schemes currently in place. Those in existence are usually composite schemes which include elements of company tax, duties, royalties, and government charges which retain aspects which contribute to increased business risk.

The application of the pure form of the tax should result in the development of more marginal deposits due to the reduction of risk in the early stages of project development due to reductions in operating costs associated with royalties and government charges.

## THE CASE AGAINST

### THE VIEW OF THE TAX COLLECTOR

1. Compliance costs  
Compliance costs to the government

include the costs of information gathering, monitoring, collection, review, revision, and negotiation associated with the administration of a tax or royalty system. The high cost of data collection and analysis is a point raised by Caragata (1989) against the introduction of RRT in New Zealand. Caragata considered RRT to be the most administratively complex and costly of all royalty or resource rent collection options he examined for application in New Zealand.

## Records of costs and revenues for existing operations

One of the primary difficulties of applying a tax such as RRT into an existing industry is to determine the threshold for application of the tax on an existing operation. The tax relies on detailed historical records of revenues and costs which may go back over a considerable period of time. Existing operations which have been in production for a considerable period of time are unlikely to have sufficient records of past revenues and costs for an effective assessment of liability to be made. It is likely that many older records have been discarded making it impossible to verify the accuracy of costs and revenues. This difficulty was one reason for the application of RRT initially only on 'greenfields' (ie new projects in newly discovered fields) projects in the Australian petroleum sector. If RRT can only effectively be applied to new projects a considerable period would need to elapse before the government would realise any financial benefit from its introduction. It is also likely that a considerable amount of rent (super profits) would also be lost to government from profits of existing mines. Introduction of RRT to existing Bass Strait petroleum operations is proposed with implementation to begin in the near future.

## 3. Neutrality

It has been claimed by Caragata (1989), Swan (1984), Fane and Smith (1986) and Hogan and Thorpe (1990) and others that RRT is not truly neutral and results in distortion

in investment patterns. One of the factors affecting neutrality is ring-fencing. The unavailability of full loss offsets from failed exploration is likely to skew investment in favour of the existing discoveries or lease areas due to ring-fencing. The removal of ring-fencing with respect to exploration expenditure could result in very low levels of RRT collection due to a company's exploration expenditure being written off against its most profitable mining operations. Caragata (1989) also states that RRT is overly sensitive to costs, with capital costs and operating losses having a greater than desirable effect on the tax threshold. The longer the gestation period between investment and cashflow the more significant this becomes. Fane and Smith (1986) have argued that this is only the case where the threshold rates are high and exceed a company's internal cost of capital. Hogan and Thorpe (1990) suggest that RRT becomes neutral only if full loss offsets are allowed to reduce the effects of risk on the industry. They recommend that RRT should be modified to remove the risk premium from the threshold rate lowering it to the cost of capital and allow full loss offsets instead. These arguments have been heeded by the Australian government and in July 1990 the Petroleum RRT for offshore developments was amended to allow full exploration loss offsets along with a consequent reduction in the threshold from the long-term bond rate plus 15 per cent to the long-term bond rate plus five per cent.

## 4. Increased sovereign risk

The Australian Mining Industry Council (AMIC) in its critique of the Industry Commission's 1991 report on Mining and Minerals Processing in Australia claimed that RRT increased sovereign risk. The collection of royalties from some operations would be delayed or may even be non-existent in some cases. Royalty levels payable would also be subject to fluctuation along with commodity prices and company profitability. This uncertainty with respect to the levels of royalties to be collected would reduce

governments ability to plan revenues and expenditures. AMIC also criticised the Industry Commission for its proposal for compulsory introduction of RRT to new and existing operations. However the commission did not recommend its compulsory application to existing operations as per the following recommendation:

*If a pure-rent royalty regime is adopted, existing projects should, within a short period of its coming into force, have a once-only option of changing to it.*

The effect of this recommendation is to lessen the sovereign risk to those operations already in existence.

## 5. Vertical integration

Vertically integrated companies with downstream processing capability may be in a position to undertake transfer pricing of mine products in order to reduce mine profits. The lowered mine profitability would reduce liability to RRT whilst not affecting overall company profitability through increased profits in downstream operations. The net effect is to reduce the likelihood of reaching the RRT threshold thereby reducing the ultimate tax take from the mining operation.

## 6. Gold plating

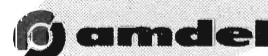
Fane and Smith (1986) and Caragata (1989) claim that RRT could lead to over expenditure on capital items in order to reduce the possibility of reaching the tax threshold. Such excessive expenditure is known as gold plating. This is again more likely to

## Gold metallurgy

- Gravity concentration
- Agitation cyanide leaching
- Column cyanide leaching
- Flotation
- Oxidation of refractory ore: roasting/bacterial/pressure
- Carbon adsorption
- Gold mineralogy of ores and tailings

## Further information:

Paul Capps or Dr John Tustley  
Phone: (08) 416 5200





occur in vertically integrated companies where the gold plating could be used as a transfer pricing strategy in order to make other business operations not subject to RRT more profitable at the expense of the mining operation.

## 7. Dynamic investment efficiency

Caragata (1989) indicated that RRT would result in a reduction of investment efficiency due to the deflection of resources away from new exploration in greenfields areas into more explored areas within ring-fences. This would ultimately lead to a reduction in the number of new discoveries and progressively to a lowering of the defined resources awaiting development. Gold plating is another example of a possible reduction in investment efficiency.

## 8. Commonwealth/State issues in Australia

Difficulties arise in Australia as a result of a High Court interpretation of Section 114 of the Constitution that the Commonwealth Government cannot levy taxes on State owned property (Hinchy and others, 1989). Mineral resources are the property of the States and as a result the Commonwealth Government currently has no unilateral power to introduce any new royalties or taxes on these resources. Given that RRT is by definition a tax on the resource rather than the mining company, Section 114 of the Constitution may require amendment before any Commonwealth resource rent tax could be introduced.

If RRT is implemented, the distribution of RRT revenues between State and Commonwealth authorities within Australia is also an issue which would need to be resolved. Currently the States levy charges against mines such as rail freight and port charges as tax collection measures in order to capture some of the rent generated by these projects. These pseudo-taxes currently reduce the Commonwealth's ability to raise revenue through taxation of profits and would effectively reduce the amount of rent available for collection by RRT.

## THE VIEW OF THE OPERATOR

The mining industry shares many of the above concerns over the costs and difficulties of operating an RRT scheme although in some cases for different reasons. A general concern to industry is that RRT may be introduced in addition to the existing array of taxes and charges rather than in replacement of the existing system. Issues of particular concern are outlined below.

### 1. Accumulator rate

AMIC (1991) stated that the investment neutrality of RRT is critically dependent on the threshold rate employed. It asserts that companies require a higher than average rate of return on successful projects to compensate for the losses sustained in exploration and unsuccessful projects. Ring-fencing of projects for RRT would reduce profitability from the successful mines by imposing a tax on that success without allowing for under performing operations or exploration to be averaged in. RRT at a threshold rate equivalent to a company's internal cost of capital would only be neutral if full loss offsets were allowed from failed projects (Fane and Smith, 1986). This essentially means that the tax is only neutral if projects are not ring-fenced. The South African tax authorities have recently proposed introduction of partial loss offsets on ring-fenced gold projects based on a specified formula allowing offsets of up to 25 per cent of taxable income from other wholly owned projects (Van Blerck, 1990). This possible avenue has yet to be explored in the Australian context. The relaxation of the petroleum offshore RRT in 1990 to allow full exploration loss offsets coupled with a lower threshold may be an indication that such a policy will also follow for minerals and coal projects thereby reducing the validity of the AMIC argument.

### 2. Exploration disincentive

High risk ventures such as mineral exploration require high returns to justify that level of risk. The taxing of highly profitable mines at higher rates through RRT reduces those high re-

turns and therefore the incentive to explore. Due to the international mobility of the mining investment industry, any reduction in potential overall operating profitability in any one country would result in the movement of exploration expenditures into countries with more favourable taxation systems.

### 3. Operational efficiency

RRT acts to reduce incentives for operational efficiency. Under RRT any increase in profits accruing as a result of increased efficiency will be shared with government at a rate in excess of normal company tax rates. Under existing tax schemes increased profits resulting from improvements in efficiency would accrue wholly to the company except for that portion paid through normal company taxes (AMIC, 1991). AMIC stated that RRT would act to discourage increases in operational efficiency especially if such efficiency gains result in the company exceeding the RRT tax threshold.

### 4. Research and Development

AMIC also claims that RRT would act to discourage Research and Development which are essential to the maintenance of a competitive industry. The obvious objective of R&D is to improve the efficiency of either the mining or mineral processing operations. Any such efficiency gains resulting from this R&D effort increase the likelihood of the company exceeding the RRT threshold.

### 5. Sovereign risk

The industry also considers that sovereign risk is increased through the introduction of RRT. AMIC (1991) has outlined both practical and public relations aspects of sovereign risk. The industry is concerned that any delay in the payment of royalties by mining companies would be perceived by the general public as a failure of the industry to pay its way. Such public assessment of the industry could result in political pressure to alter threshold rates for existing operations. AMIC is therefore unconvinced that any rates established

under RRT would be consistent over time thereby increasing sovereign risk through upsetting the fundamental assumptions upon which capital investment decisions are made. As an example of this, the threshold rate for the offshore petroleum RRT was altered within six years of its introduction.

## 6. Multiple ownership and transfer of ownership

The complex ownership of many large mineral and petroleum developments and transfers of ownership between parties is expected to create additional administrative costs for both companies and governments. Due to the large capital investments required in most modern mines, ownership is often shared in joint ventures in order to spread risks. The allocation of revenues and costs to various owners and the application of overhead costs from multiple sources introduce significant complications into the administration of the tax. The transfer of ownership brings with it special difficulties. Under normal tax legislation losses are not transferable or saleable, whereas the treatment of past losses is a primary component in the operation of an RRT system.

## 7. Profits followed by marginality

The nature of the accumulation of revenues and costs can have a significant effect on mine profitability in cases where a mine is initially very profitable and triggers the tax threshold, followed by a period of prolonged marginality. The higher tax or royalty rate stays in effect until such time as there is a negative cashflow. The effect of this on net after tax cashflows is that a very marginal mine could be paying taxes at elevated levels even when the return on funds employed on an annual basis may be very poor. This argument is of particular concern to industry sectors which suffer rapidly fluctuating commodity prices.

## CONCLUSION

The structure of resource rent taxation or royalty systems has been studied with some

examples from the Australian and Papua New Guinean mining industries. Advantages and disadvantages of various structural approaches from the points of view of the resource owner, taxation authority and mine operator have been studied.

It can be claimed that resource rent taxation approaches are relatively neutral with respect to investment decision-making. They may not be neutral in their effects on overall company performance due to possible negative effects on exploration and research and development. In some respects resource rent taxes can be seen as impositions on operational efficiency with the most efficient operator paying the most tax. Any application of the tax on existing operations is likely to be both complex and costly for governments and companies alike. However, successful application to greenfields developments has been demonstrated in Papua New Guinea.

Key structural parameters of concern are accumulator rate, tax or royalty rate and deductible expenses. With a need to cover losses from unsuccessful exploration and possible development failures, mining operators would look either to full exploration loss offset or an accumulator rate established at a level sufficient to compensate for individual project risk and total mining industry risk. Accumulator rates proposed to date are believed to be below rates considered necessary by mining companies to guarantee future investment in mining in Australia.

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## Comminution testing

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- Rod mill work index
- Abrasion index
- Impact crushing work index
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- Advanced media competency
- Ultrafine grinding

### Further information:

Dr John Tuffley or Paul Capps  
Phone: (08) 546 5200

