1. INTRODUCTION

The Problem

Until recent years the proportion contributed to total Government revenue by the petroleum industry has continued to increase. However, Australia's oil reserves are now diminishing as known fields are consumed, and exploration efforts have failed to locate new sources of petroleum.

The oil industry has called for the relaxation of the Government take in order to encourage exploration activity for the replacement of reserves. In an environment of low world prices and continuing high levels of taxation it has been submitted that the balance between taxation and exploration incentives has tipped against exploration activity.

The broader economic consequences of lower self sufficiency are significant, particularly in terms of the current account deficit and economic security.

The most contentious form of Government revenue is described as secondary taxation. These taxes are levied in addition to company income tax. Nellor (1983, 301) suggests that these taxes have been imposed in a typically ad hoc fashion with no consideration of the role of resource taxes within the tax system as a whole. Yet the present Federal Government has introduced a Petroleum Resource Rent Tax which they argue is of sound rationale and will ensure that the community, as a whole, will gain an equitable share from the diminution of the country's scarce natural resources.

Government discussion on tax reform has concentrated on the most appropriate form of secondary taxation without first examining whether there is, in fact, a case for the imposition of any secondary taxes.

Scope of Analysis

This paper will address the impact of the range of taxes which apply to the petroleum industry. Particular attention will be given to the alternate forms of secondary taxation and their effect on the industry in terms of the commonly used criteria for evaluating taxes. These criteria are: equity, efficiency and simplicity. Using this framework the various taxes will be analysed individually. Beyond the oil industry this paper will examine the broader economic effects of petroleum taxation policy.

The analysis would not be complete without a review of the political environment which give rises to Government policy. An understanding of the position taken by the Government can only be achieved if we are aware of the motivations and interests of the politicians. Conversely it is in the interests of the oil industry to minimise taxation because of its obvious inverse relationship with profitability.

In light of this objective analysis and the subsequent discussion, the aim of this paper is to determine the most appropriate form and level of taxation for the petroleum industry in Australia.
2. INCOME TAX

Income Tax is levied by the Income Tax Assessment Act. The tax is imposed on residents on income they receive from all sources and for non-residents, on Australian sourced income only. Liability to tax is ascertained on the basis of an assessment made for each year of income on a return submitted by the taxpayer.

The Tax Base

Income Taxation is levied on the "taxable income" of the taxpayer for any year of income. The term "taxable income" is defined by the Act as assessable income less allowable deductions. The taxpayer's liability for income tax is then calculated by applying the prevailing tax rate to the taxable income for that year of income. This calculated tax liability may be reduced by the subtraction of tax rebates. The income tax base is therefore defined by the interaction between these elements producing a net tax payable.

The legislation does not provide a statutory definition of "assessable income" but its legal meaning has been established in common law. Allowable deductions include any losses or outgoings incurred in gaining or producing assessable income, or those necessarily incurred in carrying on a business to produce assessable income. Losses or outgoings of a capital or private and domestic nature are not allowable deductions for the purposes of the Act (Section 51(1)).

The concept of income provided by the legislation is far from being concise. Not only because of the way the legislation has been drafted but also because of the administrative problems in measuring the value of certain items which would be included in a comprehensive income tax base (Groenewegen 1984, 124). The present Federal Government has, however, moved to tighten up the income tax base by taxing areas such capital gains and fringe benefits.

The Rate Structure

A flat rate or proportional tax rate is applied to company assessable income. The present rate is 39%.

In terms of administrative efficiency the flat rate structure allows for easier tax calculations when compared to the personal income tax structure. It is also argued that incentives to avoid and evade taxation are lower under this regime (Groenewegen 1984, 151). However, the complexities as to what is "taxable income" still exist.

Depreciation

The expiration or diminution in the capital value of a company's productive assets is allowed for by a depreciation charge which may be offset against assessable income for any given period. Taxpaying companies can maximise the present value of tax saving by depreciating assets as soon as possible (Groenewegen 1984, 147). To counter this the Commissioner of taxation has issued strict guidelines as to the rate at which certain classes of assets can be depreciated.
The Government has sought to use the depreciation provisions as a means of encouraging investment in certain targeted industries. These provisions are designed to subsidise the cost of investment to industry. Petroleum exploration is one such subsidised activity which is conferred special concessions in the deductibility of certain capital expenditures. Under Div. 10AA (sections 124-124AR of the Income Tax Assessment Act 1936) items of petroleum capital expenditure qualify for depreciation type tax deductions over specified periods of time (see Appendix 1.). Such expenditure would not ordinarily attract depreciation under established statutory and common law principles. The effect of this is to raise the present value of the tax savings derived by the petroleum companies which would not otherwise accrue if the expenditure were non-deductible for tax purposes.

Income tax concessions of this nature afforded to the mining industries, considered in isolation, may induce non-neutral investment decisions when choices are made and resources are allocated between mining and other industries. There is no doubt that potential investment opportunities would become less attractive if the incentive was to be removed. Such concessions induce non-neutral decision making on behalf of potential investors who will anticipate the artificial tax benefits available to the mining industries when making investment decisions.

Yet with reference to the recent exclusion of production plant and equipment from Division 10 and 10AA A.P.E.A. (1989, 13) argues that petroleum industry concessions are justified given the nature of mining operations. Petroleum projects are characterised by high capital costs and long lead times and therefore plant depreciation should commence from when the expenditure is incurred and not when "installed ready for use". For the same reason, carried forward loss deductions should not be limited to a seven year period as some companies may have insufficient income to offset against the losses.
Some writers define the concept of depreciation as an allowance made against a taxpayer’s net income designed to keep its capital stock intact (Groenewegen 1984, 147). They cite the legislation’s use of an asset’s historical cost as a reference point for calculating depreciation, and claim that the effect of inflation does not allow the taxpayer to keep its capital stock in place. This is because asset costs rise with inflation, but depreciation charges based on historical costs, only make allowances at a constant rate. The failure of the income tax system arises when trading income is expressed in current terms whereas depreciation charges are expressed in historical dollars. It is of interest to note that the Government has acknowledged the impact of inflation on prior expenditure in the more recent Petroleum Resource Rent Tax yet no changes are imminent in respect of income taxation.

Interest versus Dividends

Groenewegen (1984, 154) identified the inconsistent tax treatment for returns of alternative means of raising business finance. Interest paid on loaned funds is deductible for tax purposes while dividends paid as a return on investments are not. This would give rise to instances where companies will seek borrowed funds as opposed to issuing new shares to raise funds to support their operations. In periods where credit is tight or interest charges are high, many highly levered companies will suffer financial problems. This situation subsidises borrowing in the market as a source of investment finance relative to share issues, which may end in financial instability.

Furthermore, the Taxation Review Committee (Groenewegen 1984, 157) reported on the scope available to foreign investors to minimise Australian company taxation and withholding tax by advancing funds to Australian subsidiaries. The Australian profit would be reduced as interest payments are deductible, and withholding tax would be applied at the lesser rate attracted by interest payments as opposed to dividends. The resulting incentives for foreign investors to loan funds, rather than invest, could lead to considerable revenue loss for the Government.

Since the time of the Taxation Review Committee report the Government has introduced statutory restrictions on the deductibility of interest paid by an Australian enterprise on debts owed to a non-resident shareholder. The restriction applies where the non-resident shareholder holds at least a 15% interest in the enterprise. Deductions for interest in these circumstances are allowable only to the extent that foreign debt to equity does not exceed the ratio of 3:1. This legislation, together with the exemption of franked dividends from withholding tax under the imputation system, have partially offset the favourable treatment afforded to loan finance. However, the relative advantages over share capital still exist.

Dividend Imputation System

The imputation system has been introduced from July 1, 1987. The system is intended to confer upon shareholders a tax credit for assessable dividends received where the paying company has already paid company tax in respect of the profits that generated these dividends.
At the time when the system was introduced the company tax rate was equal to the highest marginal personal rate of tax at 49%. Equality between these tax rates was designed to remove any incentive for companies to retain profits or pay dividends with the view of securing a tax advantage. That is, the choice between retention and dividend was neutral from a tax perspective and avoidance behaviour would be eliminated. However, since this time the Government has reduced the corporate tax rate to 39% and thereby subverting the balance between the alternatives. Companies are now induced to retain funds and enter into avoidance behaviour so as not to attract the higher levels of taxation which apply to individuals. Franked dividends will have only been taxed to a rate of 39% and so are subject to a further 10% tax in the hands of individuals.

Administrative and Compliance Considerations

The most obvious shortcoming of the income tax base in Australia is its complexity and the inherent uncertainties which have always hindered its application. Testimony to this fact is the push for a general consumption tax which first came under discussion as the Federal Treasurer’s preferred option for tax reform in 1986. Income taxation has been very hard to apply in practice and the legislation is subject to continual subversion by the legal and accounting professions.

The magnitude of the problem can be demonstrated by the constant growth in the size of the legislation, much of which represents attempts to cover weaknesses identified in the original provisions. Moreover, there is a steady flow of case law where the courts are asked time and again to interpret contentious areas. In this environment the costs of compliance are high as professional help must be sought by taxpayers to best represent their affairs amidst the multitude of requirements and rulings.

Compliance costs are also felt in the need to keep additional records on behalf of the Government. Not only are separate books of account required for assessable income and deductions, tax depreciation and Group Tax records; more recent requirements include fringe benefits records, motor vehicle log books and non-deductible entertainment expenditure.

In the same way the costs of administering the income tax legislation by the Taxation Department are equally as high. The Tax Department must ensure compliance and assess all new taxes, rulings etc. as they come into force. There is a direct relationship between the complexity of the legislation and the number of officers required to administer its directions.

On this criteria alone the income tax base rates very poorly as a tax and shows no immediate signs of improvement. The direction now, as has been successfully applied in New Zealand, is for greater reliance on general consumption type taxation as a more efficient alternative in relation to compliance and administrative costs.
Summation - Income Tax and the Petroleum Industry

In terms of economic efficiency, income taxation as a tax on profits (as defined by the Income Tax Assessment Act 1936), is at first glance neutral in its impact on all modes of Australian business. Corporate income tax is applied at the same rate to all industries.

However, upon closer examination one can observe inconsistencies in the treatment of the following items:

1. Income tax concessions in the form of depreciation allowances are applied to the mining and other industries. The Government has forfeited the neutral tax base in an attempt to encourage investment in targeted industries. This favourable income tax treatment afforded to the petroleum industry is more than offset by the discriminatory secondary taxes imposed on the industry. Inflation has the effect of diminishing real depreciation deductions in subsequent years of income.

2. The deductibility of interest and the non-deductibility of dividends has affected the neutrality of the alternate forms of business finance. This could lead to an Australian revenue loss when, in combination with the lower withholding tax rates which apply to interest payments, overseas investors exploit the opportunities available to them to transfer profits overseas.

3. Recent divergence between personal and corporate tax rates has given rise to a situation where taxpayers will seek to retain profits in companies rather than pay dividends to shareholders.

In each case the inconsistent tax treatments will lead to non-neutral decision making where transactions and activities are directed towards securing tax benefits rather than for any purely business purpose. In terms of administrative and compliance costs the income tax base performs poorly as a very costly tax to the community.
3. SECONDARY TAXATION

Australian petroleum production is subject to secondary taxation under either of two alternative tax regimes. The first of which is the excise/royalty system and the second, and more recent, resource rent tax (RRT).

The excise system has its origins in the more conservative elements of Australian politics and was introduced to encourage energy conservation. By contrast, Resource Rent Taxation has arisen from quite different origins; out of the more socialist party's philosophy of the community's entitlement to compensation for natural resource depletion. No matter what the source, secondary taxation imposes a heavy cost burden on oil production.

Any new offshore production beyond three miles is under the control of the Federal Government and is now subject to Resource Rent Tax (RRT). The Jabiru and Challis oilfields of the Timor Sea are the only producing fields subject to Petroleum Resource Rent Tax. Those producing areas established prior to the introduction of RRT in mid 1984 were excluded because of the problems associated with the application of RRT to a developed area.

The crude oil excise system applies to Bass Strait production from the VIC-P1 permit area, the North West Shelf and all onshore production excluding Barrow Island. All other areas are subject to RRT. Onshore areas will only be subject to RRT if agreement is reached between oil producers, the host State Government and the Federal Government. Otherwise onshore production is taxed under the excise system.

3.1 CRUDE OIL EXCISE

Excise is levied on oil producers under the Excise Tariff, Excise By-Laws and Spirits Act By-Laws.

Background

The excise system on crude and LPG production was introduced by the Federal Government in 1975 following the dramatic world crude oil price rises of 1973/74. The crude oil levy raised the price of domestically produced oil to that of the world markets and, together with the simultaneous introduction of income tax concessions, were expressly designed for the following purposes:

1. To encourage fuel conservation, under the assumption of an apparent price elasticity of domestic petroleum demand.

2. To encourage substitution of equipment using energy in more plentiful supply in Australia (Groenewegen 1984, 327).

The intended result was a shift away from petroleum based energy forms, of which Australia was not well endowed. Long term domestic self sufficiency of oil could not be maintained, and the Government saw the need to alter the direction of Australia's energy consumption structure to one which would consume more of those energy forms domestically available.
Insulation of the domestic economy from future international crude price rises required a shift in consumption away from crude oil. This is a problem which traditionally aggravated Australia's Balance of Payments. In retrospect these policies have at least been partially successful in inducing the desired result. Energy demand by major fuel type (Appendix 2.) shows a relative decline in the consumption of petroleum products as opposed to other energy sources since 1973/74. From 51.6% in 1973/74 to 38.9% in 1985/86 a fall of 12.1% over the 12 year period. However, crude oil remains a critical source of energy for the transport sector.

Despite evidence of some shift in Australia's energy consumption, crude oil has demonstrated a degree of inelasticity in respect of prices and the impact of alternate energy sources has been gradual. One reason for this is that the machinery and vehicles presently imported and manufactured in Australia are still largely powered by petroleum energy sources.

The Government was less open when discussing the impact of additional revenue raised by these policies and how, as with any other revenue increase, its political mechanisms of spending will grow to depend on the contribution offered by this new taxation.

Bass Strait crude has dominated the Federal Government's excise receipts. It applies to those fields which commenced production before August, 1977. The crude excise system has undergone substantial changes since 1975 and the present system is the result of changes introduced in 1983 with less significant adjustments since that time in 1984 and 1987.

(technical specifications on the Crude Oil Excise were supplied by the Esso Upstream Planning Department.)

The Tax Base

Crude oil excise is levied on oil production from certain geological formations called "oil fields". Field production is assessed over the Australian Fiscal Year from July through to the end of June.

The Rate Structure

Excise is levied as a percentage of the realised sale value of oil, and within each of the following categories of oil there is a progressive scale of excise rates which are applied to field production. These rates are presented in Appendix 3. In 1989/90 the maximum old oil excise rate will fall to 75% unless the price of crude oil exceeds A$ 32.50 B, then the maximum rate may be increased to as much as 80%.

Payment of excise is made throughout the year on the assumption that the YTD production rate will be maintained to the end of the fiscal year. Excise is pro-rated for fields which commence production during any fiscal year.
Classes of Oil within the Excise System

All oil fields are classified as either old, intermediate or new oil fields.

Old Oil fields are those discovered prior to September 1975 and developed prior to October 1984. Most of the producing Bass Strait fields fall into this category, except for Fortescue.

Intermediate Oil is produced from fields discovered before September 1975 but developed after October 1984. This category was introduced in response to a request by Bass Strait producers for a reduction in the high excise rates which apply to the old oil fields. This change was necessary to encourage the development of the known smaller fields in Bass Strait which would otherwise be uneconomic at the old excise rates. Negotiations for the intermediate category focused upon the development of the Bream field (35 MB Reserves).

New Oil is derived from "naturally occurring discrete accumulations" discovered after 1975. Fortescue is a new oil field and future developments include Whiting, Seahorse, Whiptail and Tarwhine.

Substantial New Developments (SND) - Another economic shortcoming of the old excise system occurred when major new developments on existing old oil fields were unprofitable at the old oil rates of excise. In such a case, if the production from the field exceeded 10.3 KBD, all of the production generated by the development attracted excise at the highest marginal rate. Perhaps one could argue that the system itself did not fail but the rate of excise attracted by old oil was too high. The Government recognised this situation where oil producers had no incentive to utilise these reserves, and so responded with the introduction of the principle of substantial new developments.

The South Mackerel field was such a case where development required the drilling of two extremely long and expensive kick wells from the Mackerel platform. The high costs of the wells meant that it qualified as an SND, thereby, ensuring that production was treated as if it were coming from a separate field. Hence it received its own untaxed production threshold of 0.9 KBD and the relevant scale of rates to 10.3 KBD which attracts the highest marginal rate.

Successive cases of SNDS have been negotiated on a case by case basis. Recent applications involving East Kingfish and Tuna B developments have established that SND treatment would only apply to incremental old oil, as distinct from accelerated old oil developments.
Negotiations for SNDs will determine the "separate quota" treatment received, set with reference to the quantity of oil to be recovered and a rate of return to the producer comparable to the Bream Project. The Bream Project was used as the basis for negotiating the intermediate excise scale. The benchmark rate of return is 30% (Producer's internal rate of return) before income tax. Production which exceeds the SND quota is treated as incremental production from the host field and pays excise at the highest marginal rate applicable to that field. The SND quota can be set at any level up to 100% of the incremental old oil, but will be reduced by the amount necessary to derive the benchmark rate of return.

On the introduction in June 1987 of the 30 MB excise free quota for large investment projects, the role of SNDs has been reduced.

30 MB Threshold - A further adjustment was made from July 1987 where an exemption from excise was given for the first 30 MB of crude production from new offshore project areas and onshore fields. For onshore fields the 30 MB allowable for each field accumulates from the date of first production and only that portion produced after June 1987 is excise free.

This change was designed to encourage the development of small and marginally profitable fields. That is, if the cost of developmental expenditure could be covered by the higher returns on the first 30 MB then the producer will have a greater incentive to develop the field.

The next scheduled review of excise rates is 1990, when a further reduction of the top old oil excise rate is expected.

Freemarket Sales

Production in excess of the fixed allocations to domestic refiners is sold on the domestic and export free market. A sliding scale rate of excise is then applied to such sales offering some excise relief during periods of low prices.

Analysis

It is quite clear from the above that the application of the excise system has been characterised by ad hoc adjustments to suit the prevailing circumstances. Negotiations between the Government and producers follow a consistent pattern where producers will refuse to develop potential oil reserves until the Government applies an excise regime which allows them to attract sufficient returns to make the venture commercially viable. The Government, on the other hand, wishes to generate as much of its own revenue as possible and will only lower its excise take to a level in which it perceives will induce producers to commence development. The Government has gone so far as to even set the rate of return it believes oil producers ought to receive, and therefore, maximising its revenue accordingly. This is an astonishing practice which is unparalleled in business taxation. In no other mode of Australian taxation is a Government allowed to impose a rate of tax set to induce a specified rate of return to business.
It is not surprising that the Bass Strait producers have refused to give the Government forecast income and expenditure data for the determination of SNO quotas.

Moreover, this excise system lacks any sound rationale and is a poorly administered tax base. Excise taxation ought to be applied from an objectively predetermined excise policy rather than by short term adjustments to meet prevailing circumstances. This regime has led to an environment of uncertainty for oil producers who, when attempting to assess the potential profitability of any prospective development, must allow for the political risk associated with the actual excise structure to be applied. Potential profits from oil production are already subject to gross uncertainties in respect of oil prices, actual oil reserves, exchange rates etc. Oil producers are also faced with the prospect of short term excise changes depending on the prevailing political climate. This problem is accentuated in the resources sector because of the long lead times of development projects, and possible changes in Government who may seek short term revenue at the low political cost imposed by the resources industry.

From this point of view the Resource Rent Tax is far superior to the excise regime as the rationale for the tax is well documented and the tax base has been specified. The rate of tax also appears to be set and as such is not likely to be subject to short term changes.

Economic Efficiency

Crude oil excise is a secondary tax above and beyond income tax, and therefore, represents an additional burden on the oil industry which is not shared by other industries. The tax is non-neutral in respect of business decisions to invest in oil producing ventures, as opposed to other business ventures. The additional burden imposed on the oil industry will induce investment in other industries thus interfering with the allocation of resources between industries. In terms of Musgrave’s definition (1975, 303-323) this tax is inefficient.

Groenewegen (1984, 102), however, would regard the oil excise as an efficient tax so long as it was suitable and flexible to achieve the Government’s desired objectives of resource allocation, income distribution, stabilisation and economic growth. This definition does not hold in the situation where the Governmental objectives are not consistent with those of the community in which they serve. The political process is such that it will induce Governments to act outside the best interests of the community, and politicians will act in their own self interest (see The Political Process below).

Simplicity

The excise system as it stands does not place onerous burdens on compliance and administration, and therefore can be considered a good tax from this perspective.

Equity

In terms of horizontal equity the crude oil excise discriminates against the oil industry for the reasons noted above. This area will be expanded below in respect of all forms of secondary taxation.
3.ii ROYALTY

Royalties are another form of secondary taxation imposed jointly by the Commonwealth and State Governments, but they are of lesser cost to the industry than the Crude Oil Excise or Resource Rent Tax. The royalty is levied by the Petroleum (Submerged Lands) Act 1967 and associated legislation.

Federal and State royalties are imposed on all areas not subject to RRT.

The Tax Base

The royalty is assessed on the value at the wellhead of petroleum produced from a Licence Area. The value at the wellhead is the value at the point of custody transfer, excluding excise, less capital and operating costs downstream of the wellhead to the point of custody transfer. (Esso 1987)

The costs of operating facilities which are directly downstream of the wellhead are completely deductible for royalty purposes. These would include onshore processing plants. For other machinery, installations and processes only agreed proportions of the costs are deductible. For example platform structures attract only a 20% deduction, helicopters 50%. Capital expenditures on assets downstream of the wellhead are depreciated for royalty purposes at a straight line rate of 5% per annum with an 8 1/2% cost of capital allowance.

The Rate Structure

The percentage applied to wellhead value varies from 10% to 12 1/2% depending on whether production is from a Primary Licence area only or a Primary and Secondary Licence.

A Primary Production Licence attracts royalty at the rate of 10%, 6% going to the State Government and the remaining 4% to the Federal Government. The State Government receives any additional royalties above 10% where applicable.

On the discovery of petroleum in an exploration permit area the permit holder may nominate 9 blocks (geographically defined areas) as a location; including and surrounding the block where the petroleum was found. The location holder then has a period of 2 years to apply for a production licence. He may apply for a primary production licence on a maximum of 5 out of the 9 blocks on the location. If he wishes to hold more than 5 blocks he can apply for a secondary production licence but these carry an additional royalty of between 1 and 2 1/2% giving a total royalty rate of between 11 and 12 1/2% for the total primary and secondary licence areas. (Esso 1987)

Royalties are payable on the last day of the month following production.
Economic Efficiency

As a tax on a modified measure of profitability the royalty is relatively neutral in respect of decisions made by oil producers to develop certain areas. The measure of profitability is less than perfect, however, as only limited expenditures are deductible for royalty purpose (i.e. those downstream of the wellhead).

This tax would favour those investment opportunities which carry greater proportions of expenditure downstream of the wellhead whilst discriminating against those where costs are concentrated upstream of the wellhead.

A.P.E.A. (1989, 19) contend that the existing classification of costs as either pre or post wellhead, gives rise to a disincentive to maximising petroleum recovery. The organisation has called for a redefinition of wellhead costs so that gas recycling and enhanced recovery project costs would be treated as post-wellhead, and therefore, would be deductible. Deductibility for Royalty purposes will enhance the economics of individual projects and slow the decline in Australia's known reserves.

From the broader view the tax will work against oil production ventures as opposed to other business ventures because the tax is only charged to the oil industry. More resources will be allocated to all other untaxed industries which do not bear the same burden.

Equity

In respect of horizontal equity, this tax quite clearly discriminates against the oil industry to which it is only applicable. This occurs in the same manner as the Crude Oil Excise.

Simplicity

This tax defines an alternate measure of profitability to that used by the income tax base, and therefore, requires the taxpayer to maintain yet another set of books of account, depreciation etc. The compliance costs are not usually considered by the Government when such taxes are devised.

Furthermore, the legislation does not clearly define some of its elements. For example, the question of where the wellhead is located for subsea completions such as Cobia-2 is subject to litigation between the producers and the Government authority.
3.iii PETROLEUM RESOURCE RENT TAX

Background

The concept of a resource rent tax emerged out of the Australian Labour Party National Conference of 1977. At the time it was thought there would be continuing growth in the demand for Australia's mineral resources. The unprecedented rise in the world price of crude oil during 1973/74 resulted in an increased demand for alternate energy sources. For example, Japan required more Australian coal for power generation (Leigh 1983, 12).

It was perceived that there was a great deal of wealth to be generated from the exploitation of Australia's natural resources. The Labour party believed the mineral and energy resources belonged to the Australian community, and the benefits that accrue from their exploitation should be shared equitably between the producers and the community. Implicit in this policy was the presumption that the existing taxation structures were not facilitating the equitable distribution of benefits between the mineral producers and the community (Leigh 1983, 12). Perhaps this was true for some industries where the reported profits of some large multinational companies received adverse publicity, however, the crude oil excise was a secondary tax that had already applied to oil production. The introduction of Resource Rent Taxation (RRT) did, however, represent a fundamental redirection of taxation policy by relating tax to profits rather than oil production. Large profits were rejected by the socialist sections of the party.

In retrospect the demand for Australian resources was not sustained, and the general fall in world commodity prices of the 1980's meant that the expected wealth to be generated from energy and minerals, was not realised. Furthermore, the resource tax originally proposed for all mining industries has only been imposed on the production of petroleum. The final legislation came 10 years after the original proposal. This delay, according to Mr Sinclair (House of Representatives, 2 November, 1987), characterised the change in the nature of oil exploration in Australia between the time of the policy's inception in 1977 and that of the eventual legislation in 1987.


The Tax Base

The tax applies to certain offshore petroleum projects and is based essentially on the excess of specified receipts from the project over relevant expenditure (C.C.H. 1989, 780). In other words, petroleum resource rent tax (RRT) is imposed on profit as defined by the legislation.
Tax is payable on the taxable profit derived from a petroleum project. Where the assessable receipts exceed the deductible expenditure the person shall be taken to have a taxable profit of that excess.

Assessable Receipts

Assessable project receipts include amounts receivable from the sale of petroleum, or of a marketable petroleum commodity. Where the producer also refines the product a market or "fair and reasonable" value will be attributed to the product.

Deductible Expenditure

Expenditure, whether of a capital or revenue nature, which is directly related to a petroleum project will be deductible against any assessable receipts in the year in which it is incurred. Any excess deductible expenditure over assessable receipts will be carried forward for deduction against receipts in future years.

Deductible expenditure broadly comprises;

1. Exploration expenditure.
2. General operating expenditure directly related to the project.
3. Closing down expenditure.

The boundaries of a petroleum project for the purposes of calculating deductible expenditure extend to the point at which a marketable petroleum commodity is initially stored. It does not, however, include any facility provided to enhance the value of the petroleum nor any means of transportation to convey the marketable product.

Exploration expenditure is that which is directly related to exploration for petroleum and will include the recovery of petroleum and production of a marketable commodity prior to the granting of a production licence. This will include storage and processing facilities and employee amenities. These expenditures are deductible against assessable receipts of any project established within the exploration permit area. Where more than one project exists within the permit area, exploration expenditure must be firstly offset against the assessable receipts of the project which initially received the production licence, and secondly against subsequent projects deriving assessable receipts in that year.

General project expenditure comprises of that which is incurred in the production licence area on the establishment of the project, on recovery and producing marketable petroleum commodities and storing the commodities adjacent to the production site. This will include relevant expenditure allowable on storage, processing and employee amenities.
Closing down expenditure, as the name suggests, is made up of those activities associated with closing down a petroleum project. It will include environmental restoration of a project site. Platform removal expenditure will qualify unless the platform is relocated for another project.

Where assessable receipts are insufficient to offset deductions, at the end of a project's life, a tax credit will be conferred to the amount of 40% of the excess expenditure. This credit will be limited to the RRT previously paid in respect of the project.

Specific exclusions from deduction include:

1. Interest payments.
2. Payments made under a cash bidding system.
3. Income tax and Fringe Benefits Tax payments. RRT payments are deductible for income tax purposes.

The Act makes an allowance for the diluting effect of inflation on prior year carried forward expenditures. General and exploration expenditures from the prior year are deemed to have been incurred on the first day of the subsequent year at the "augmented bond rate". The "augmented bond rate" is calculated by the long term bond rate plus 15%.

This method will ensure that prior year deductions are expressed in realistic terms when offset against income which will usually be derived later in the project life.

Similar treatment is afforded to general and exploration expenditure incurred more than 5 years before the production licence comes into force. A "GDP deflator" rate is applied to this expenditure. This aspect of the tax was cited by Mr Kerin (House of Representatives, 21 October 1987) as supportive of the retention lease system introduced in 1985 which allows a longer holding time for promising discoveries without development.

The Rate Structure

Petroleum resource rent tax is applied at a single proportional rate of 40% of the taxable profits of a petroleum project.

The Taxable Units

The taxable profits are determined for projects individually and not ascertained by an accumulation of all projects of the business entity (as for Income Tax). For the purposes of the Act a petroleum project comes into existence when a production licence is granted. The project will include treatment facilities and operations outside the licence area which are integral parts of the processing of marketable petroleum commodities.
The Minister of Primary Industries and Energy has a discretion to treat two or more projects as a single project for the purposes of the Act having regard to the following factors:

1. The respective operations, facilities and other things that comprise the petroleum project.

2. The persons by whom or on whose behalf the activities above are being provided.

3. The geological, geophysical and geochemical and other features of the production licence areas in relation to the projects.

It is in the interest of a producer to have its separate projects qualify as a "combined project" because it will enable general, exploration and GDP factor expenditure on one licence to be deductible against the income from another (Esso 1987, 57).

A "project group" as defined by the Act occurs when 2 or more projects with production licences are located within the same exploration permit. The effect of "project grouping" is to allow exploration and GDP factor expenditure only to be deductible against the income generated by any project within the group. General expenditure cannot be applied in this manner within groupings.

Payment of RRT is made by 3 instalments during any year in which a project's assessable receipts exceed its deductible expenditures including any which have been carried forward from prior years. The liability for tax is assessed at the end of the year and is reduced by any instalments already paid.

Economic Efficiency

Economic criticism of RRT has concentrated on two areas which are deemed by the industry to interfere with investment decisions associated with the exploration for, and development of potential petroleum resources. The first of which contends that RRT reduces the expected monetary returns of exploration projects because of its adverse impact on high risk large discoveries. Meanwhile RRT is said to encourage the concentration of exploration efforts in those permit areas where RRT is currently being paid. Exploration within the same licenced area may not otherwise be selected as possessing the best economic and geological potential (Foster 1988, 3).

In support of RRT the Government (Mr Brumby, House of Representatives, 2 November 1987) has argued that RRT is more likely to encourage development of marginal fields than the alternative production based excise/royalty system which is levied before costs are written off. However, the Government has not acknowledged that the most crucial decisions of the petroleum business are made at the exploration and not the production phase.
Before drilling any prospect the explorer will consider the risk adjusted cost of drilling a dry hole. In the petroleum industry the major risk is incurred during the period of exploration.

The cost of seeking resources far below the sea bed ranges over widely separated extremes and the risk of failure, despite the maximum amount of technical efficiency, will almost always be dependent upon natural factors which are unpredictable - for example abrupt loss of porosity or poor permeability in potential reservoir beds (A.P.E.A. 1987, 14).

If we consider that the success rate of Australian wildcat offshore wells is merely 1 out of every 50 wells drilled (A.P.E.A. 1987, 15) we can understand why the producer is endeavouring to make a large discovery to at least cover the cost of the 49 unsuccessful wells and earn an adequate return. Moreover, the cost of drilling a single offshore well could exceed $30 million and chances are that there will be no returns.

A producer will decide not to explore if faced with the prospect of merely finding marginal discoveries. RRT acts as a disincentive to wildcat exploration because it significantly reduces the returns to be made on high risk large fields which are the primary objective of the explorer. When levied at the rate of 40% and combined with the impact of income taxation the total Government take on incremental barrel production is approximately 63%.

The decision to drill any prospect is not only determined by the cost of drilling, the probability of success and the estimated size of the reserve, but also by the expected returns reduced by the amount of taxes imposed. The risk adjusted cash flows are calculated and then discounted at the company's cost of capital rate to reflect the impact of timing and inflation. RRT will act as a disincentive to exploration because of its severe effect on potentially high returns. The exploration decision is sensitive not only to crude oil prices but also the RRT rate which is certain to render a large portion of high risk exploration ventures unattractive at current oil prices. The adverse impact of RRT on investment decision making may be demonstrated in quantitative terms (refer below).

The structure of RRT has also come under attack for being inappropriately described as a "profits based" tax. Real profits are only derived after all costs have been deducted, including all exploration and development expenditure. RRT denies the deductibility of those exploration costs incurred outside the permit area. In commercial reality, business entities will engage in a wide range of exploration ventures in order to secure a very small number of economically viable prospects. RRT is directed towards taxing successful projects instead of business entities rendering expenditure on outside unsuccessful exploration projects undeductible. A producer may pay RRT on successful projects even though no overall profit has been earned. When outside
exploration is not deducted RRT will levy tax on an inflated measure of profitability. Oil producers will inevitably suffer an erosion of their working capital base when RRT consumes more funds than are actually generated by the complete portfolio of an entity's exploration interests. This will lead to a contraction of funds available for further exploration and development. RRT will therefore discriminate between alternate exploration structures. Explorers are encouraged to concentrate exploration activities within existing successful project areas so as to obtain the benefit of potential deductions. Conversely, exploration in new areas is penalised because, if unsuccessful, it will attract no deductions.

This aspect of the RRT design removes the neutrality from the investment decisions as it distorts the relative returns to be gained in the pursuit of alternate exploration and development strategies. The risk of failure is highest in new areas where only limited geological knowledge is available. The effect of RRT will make new areas even more unattractive when there is no guarantee of deductibility. The implications for the maintenance of Australia's oil reserves is discouraging.

According to a survey conducted by A.P.E.A. (1989, 18) oil explorers plan to drill a minimum of 32 offshore wildcat wells in 1989. This was the same as the number drilled in 1984, however, in 1984 the wells were drilled in 10 different geological basins whereas in 1989 drilling will occur in only 5 basins. Most of which is concentrated in the Gippsland and Carnarvon basins.

Similarly, the non deductibility of expenditure beyond the point of initial storage of a marketable petroleum commodity will also distort the RRT measure of profit. Expenditure is legitimately, and in fact necessarily incurred, in the ordinary course of the producers business in enhancing the value of petroleum, transportation of the marketable product and the administrative costs associated with running the business. These costs cannot be offset against RRT income. This is considered to be a conceptual flaw in the application of RRT in Australian context. In terms of neutrality the Government would be better off improving the RRT base with a better measure of actual profits and charging a higher rate to supplement the loss of revenue. This, however, would be politically unfavourable for the Government because a higher rate would give the appearance of excessive taxation which is more disguised when deductibility is limited. On the question of broadening the deductibility of exploration expenditure during the 1984 negotiations, the then Minister for Resources and Energy, Senator Walsh indicated that there would necessarily be an increase in the tax rate to ensure neutrality in Government revenue.

In support of the Government's position there are positive aspects of RRT which render it superior to the alternative excise/royalty regime. These areas have been given little attention by writers supporting the position of the industry against RRT.
In periods of dramatic fluctuations in world oil prices RRT will automatically adjust to remain at the same portion of RRT defined profits. By comparison the excise/royalty regimes, being based on production rates and no such measure of profitability, carries less flexibility, particularly in periods of short term price volatility as recently experienced. In 1986 Bass Strait producers shut in production from several "old oil" fields in response to collapsing prices and constant high levels of excise. The Government learned that there is a point where taxation levels are so high as to make production uneconomic. It is likely that the RRT regime, if applicable, would have averted the need to halt production.

From a more general perspective, as is the case with the excise/royalty system, the imposition of RRT on the petroleum profits discriminates against the industry and is non neutral in respect of exploration decisions, when compared with all other non taxed investment prospects. In terms of the extended criterion of efficiency as defined by Groenewegen (1984, 103) RRT, as a selective heavy tax on industry, does not derive any predetermined economic consequence of the Government other than taxing the "potentially high returns" from petroleum projects. As in many areas of taxation policy, the Government is least concerned about the suboptimal resource allocation impact of the tax which unnecessarily interferes with the producer's choices and discriminates against the industry. The suboptimal allocation of resources will be felt in the level of excess burden, the cost of which is imposed on the community generally, and will offset the returns from RRT taxation which are intended to compensate the community for resource depletion.

Simplicity

RRT performs poorly when measured from the compliance cost perspective. RRT has redefined the concepts of profits and the taxable units which have previously been given alternative treatment under income tax legislation. Oil explorers and producers are required to keep an additional set of records for RRT purposes above and beyond those already required for income tax. Divergence from income records will occur in regard to the accumulation of operating costs by project, rates of capital depreciation, those operating costs which do or do not attract deductions under RRT, assigning the costs of common facilities to alternate projects, the application of factor rates to prior year expenditures etc.

There is no conceptual or practical reason why RRT defined profit ought to be a more appropriate measure than that of the income tax system yet the Government has sought to rework the whole calculation in the RRT system. The two forms of legislation will be administered by alternate Government Departments. This characterises the way in which the same Federal Government has failed to bring consistency between the application of either tax and has no regard for the unnecessary compliance costs imposed on the industry. There were similar economies to be gained on behalf of the Government in administering RRT if working from the one definition of taxable profit. Savings would also accrue if it made use its existing Income Tax facilities to administer the legislation simultaneously with RRT.

Equity

As per excise/royalty. Refer to Economic Efficiency section in respect of the discrimination against oil producers of secondary taxation.
4. OTHER TAXES

Payroll Tax

Payroll tax is imposed throughout Australia by each State Government. In terms of magnitude Payroll Tax is not one of the most significant taxes affecting the oil industry, but it is of sufficient value to warrant consideration.

The Tax Base - The base for Payroll Tax, as the name suggests, is the amount of salaries and wages paid by employers. The Victorian base has been extended to include a range of employee benefits not given in the form of salaries and wages. Meanwhile all States have conferred various tax exemptions on certain industries from Payroll Taxation. The target industries and amount of these exemptions vary from one State to the next.

The Rate Structure - Payroll tax rates are imposed on a proportional basis with an untaxed threshold and shading in provisions. New South Wales and Victoria impose an effective rate of 6% of gross salaries. The untaxed thresholds vary between the States.

Economic Efficiency - At first instance Payroll Tax will discourage employment of labour as a factor of production and favour more capital intensive operations. The extent of this will depend on the incidence of the tax and the degree in which it is pushed back on to the employer. The role of this tax as an important source of revenue for State Governments tends to outweigh any social and economic considerations, even when our economy is experiencing high levels of what must be described as structural unemployment. As with most Governmental strategies, this tax is directed at large industry where it will suffer the least electoral retribution.

The divergence of the tax between the States also gives rise to non-neutrality between the taxed regions, and therefore, affects the allocation of resources between States. In relation to oil producers, however, the decision to locate operations is driven mainly by the location of hydrocarbon deposits and not the payroll tax imposed by the host State.

Simplicity - The cost of administering this tax has traditionally been low, but this may not hold given the recent acceleration of schemes designed to avoid taxation. Compliance costs are also rising particularly for those companies who operate in more than one State (Groenewegen 1984, 196).

Capital Gains Tax

The application of capital gains taxation to pre-development work program farm-out arrangements (1), is an area of contention between the oil industry and the Government. A.P.E.A. (1989, 15) has argued that no gain arises as farm-outs are a means of spreading risk and sharing the costs of exploration and not the disposal of assets. The organisation also questions how one can ascertain the market value of an exploration permit and prospecting information, prior to a commercial discovery being made.

(1) Pre-development work program farm-out arrangements occur when an oil explorer will share its interest in a permit area amongst other parties in return for an agreed contribution of funds towards the remainder of the exploration program.
5. THE AUSTRALIAN POLITICAL PROCESS

Before any attempt can be made to understand the Federal Government's position in respect of oil industry taxation, we must first of all, briefly examine the political process which is the context upon which all taxation decisions are made.

The Control of Public Expenditure

The development of the present Australian taxation structure in recent decades has been determined largely by the Federal Government's search for revenue to finance a growing public sector. Federal Government expenditure has grown in both absolute and relative terms to the GDP. The total burden of taxation has steadily increased from 6.8% of GDP in 1901-02 to 31% in 1980-81 (Groenewegen 1984, 17). The question must arise as to what has created this seemingly insatiable need of the Government to absorb more and more private sector funds.

Political forces are such that they continually move successive Governments to spend more money rather than control expenditure. In fact, political writers can see little scope for effective expenditure control in the Australian political process. Emy (1978, 350) suggests that the problem lies in the very logic of party politics which encourages the proliferation of promises and programs as the respective parties compete for votes. The parties are driven to initiate schemes granting new benefits and rights but there is not the same incentive for them to monitor policies once they have been delivered in the form of legislation. Little care is taken to see whether policies are actually achieving their stated objectives, whether their cost has become excessive, or whether the same result might have been achieved for less. Once set up, schemes and organisations become something to be funded each year, and it appears that the elected Government has little control over Departmental programmes. Emy observed that there is no ready means of cutting ongoing priorities to find room for fresh expenditure. The Government's capacity to revise priorities is limited by the lack of forward estimates and the burden of past commitments.

The growth in spending also reflects the increasing demands made of the State in an age of welfare in a mixed industrialised society. The community is demanding more government services and redistribution expenditure.
Emy (1978, 437) describes the "push-pull" effect of party politics. The parties compete for electoral support by offering voters a choice of policy packages. As one succeeds another in office, the new party enacts its own programmes and rarely dismantles the programmes it inherits. Governments are constrained by historical obligations from deviating from established levels of expenditure.

Public expenditure can therefore be characterised as an incremental system which is derived from a political system whereby elected politicians vary public spending to suit their electoral needs. Successive Governments are able to win more votes by increasing Government services/expenditure rather than by containing the level of taxation and other sources of revenue. One might observe that the benefits of Government expenditure have a more direct and visible impact than do general rises in the level of taxation. Personal income tax levels will inevitably rise as the nominal value of wages drift upwards, while taxation rates remain constant.

The most intense political lobbying campaigns, and those which receive most media exposure, are directed to the Government by groups who wish to attract increased portions of limited Government funds. Meanwhile the taxpayers cannot seem to organise themselves into a cohesive political force.

Politicians will act in their own political interests before those of the community in which they serve. The political process is such that a politician or party can only maximise its own interests by obtaining political power (Government). To do this he must win votes and many successful political campaigns have been won on the promise of increased expenditure/services.

By way of conclusion we are able to make two observations of the Australian Political process which form the context of oil industry taxation:

i. Emy has described the situation where Governments inherit the burden of commitments from the past and readily create new burdens for the future. There is no likelihood of public expenditure being reduced in absolute terms.

ii. Politicians will pursue their self interest of political survival and will therefore make suboptimal economic decisions whilst pursuing their self interest.

The Oil Industry

Herein lies the problem for the Australian oil producers. Successive Governments will receive no political benefit from imposing a more equitable taxation policy on the industry. The industry has no political or voting base and so the Government has no interest in relieving the present high levels of taxation.
It is, however, in the Government's interest to retain the revenue generated by the industry to fund its politically expedient levels of expenditure. It is also in the Government's interest to maintain acceptable levels in the balance of payments. This would explain why the Government has been most reluctant to respond to calls by the industry to relax its secondary tax regime until such time as in 1986 when falling world crude prices meant that production of "old" oil became unprofitable and Bass Strait producers shut several platforms in. In response to a greatly reduced production, the Government made several excise concessions and so encouraged renewed production. The Government has no interest in oil industry profitability but merely its own political survival.

Oil producers are aware of this, and Esso has attempted to counter this politically weak position by mounting a public education campaign designed to win some political support from the general public, that is from where the Government draws its electoral power base. Esso informs the community that lower secondary taxation levels will encourage increased oil exploration, and therefore, higher oil self sufficiency. The community will also benefit from increased industry activity in the form of greater employment and general economic growth (Esso 1987, 5).

What the advertisements do not point out is that the industry will enjoy greater profits from the relaxation of taxation. There is no argument that the oil industry has an interest in maximising its own profits, and so, will act in a manner to achieve this. This will include mounting a political campaign designed to reduce one of the most significant cost items limiting its profitability. Oil producers perceive Government taxation as a major obstacle to what would otherwise be higher profits and so, as with any other cost item affecting returns, will act in a way to minimise its impact. The arguments presented by the industry in support of reduced taxation are designed to promote the self interests of the industry, and therefore, are not objectively based.

Political analysis of the oil industry taxation debate will inevitably lead us to the conclusion that the respective parties will both act in their own self interests, and representations presented by either party must be viewed from this perspective. The relative merits of either party's position can only come through objective analysis of impact of the present portfolio of taxation on the oil industry.
The Equality of Secondary Taxation - The Communities Right to Returns

The focus of the present Labour Government’s argument in support of secondary taxation is the proposition that the community is entitled to a share in the value of the natural resources exploited by the oil companies. The oil industry accepts this notion but contends there is a question of degree which has not been satisfactorily addressed. The industry, through its representative association A.P.E.A. (1987, 11), concedes that petroleum along with other minerals is a community resource and the community has a right to charge for its exploitation or share in the profits of exploitation. Yet the industry asserts that this right is met through profit-related income tax and through royalties. In 1985/86, it is estimated that oil producers contributed $1.06 billion in company tax and royalties to Federal revenue and more than $200 million in State royalties. If there had not been a crude oil excise of $4 billion, company tax and royalties would have been $2 billion higher (A.P.E.A 1987, 11). The net benefit to the industry would have been in the order of $2 billion in additional profits for the same year.

The industry also argues that the community will benefit through employment and technical expertise which would not have been enjoyed if crude oil was imported. Whether or not the community has benefited from a more secure supply of cheaper petroleum products, as claimed by the industry, is not so clear. It is likely Australia’s largest petroleum reserves would have been developed no matter which company received the right to do so and the fact that the reserves were within Australia’s territory is more the reason for the secured supply. As far as employment and technical expertise are concerned all industries could make the same proposition, and therefore, this aspect should not be used in this context.

What might constitute an equitable return to the community, remains the contentious issue. However, we will find that it is difficult to sustain the Government’s community based argument when we view it from the following perspectives. The failure of a comprehensive fundamental base behind secondary taxation raises serious doubts as to the horizontal equity applied to the industry.

When the Government talks about compensation for the community for the diminution of its natural resources it presupposes that the injection of funds into Federal consolidated revenue is an effective means of benefiting the whole Australian community. If we were to examine Government expenditure we would find that the beneficiaries are a limited class of people.
One might suggest that only certain sectors of the community, those who directly consume most Government expenditure benefit from the compensation for the diminution of Australia’s natural resources (whilst others contribute in the form of personal income taxes). Conversely, it may be argued that personal taxation levels would otherwise be higher if not for the secondary taxation of the oil industry. Yet there is a political limit to the level of personal taxes a Government can impose and this level may have already been reached in Australia.

Whilst the redistributional aspects of Government policy may possess a deal of merit and are soundly based in the social qualities required by the Australian community, it is misleading for the Government to assert that the community at large will benefit from the injection of funds into the public purse. Any community benefit is subject to the expenditure choice of the Government of the day. Some sectors receive no benefit from the diminution of Australia’s natural resources. Moreover, many political scientists believe that public based expenditure is wasteful and politicians will only act in self interest, rather than in the interests of the community, thus leading to suboptimal benefits to the community (see The Political Process above).

The Government’s community based argument, also ignores any rights of future generations of Australians to such benefits. The Government take in respect of oil presently produced is being consumed now and will yield no benefits for future Australians who will find those resources fully expended.

The oil producer’s position is that the industry is unfairly discriminated against by virtue of the secondary taxes imposed on them. These include the crude oil excise/royalty or resource rent taxation. The profits derived in other industries, it is argued, are subject only to Company Income Taxation at a rate of 39%, whereas, oil producers pay an effective rate of between 63% to 86% after the imposition of secondary taxes.

At first glance it would appear industry is unfairly discriminated against in respect of taxation, and suboptimal economic investment decisions will necessarily follow. However, the Government will argue that such additional taxes are returns of wealth to the community for the depletion of its store of natural resources. It necessarily follows that such taxes are in the nature of compensation to the community for the proprietary rights it has vested in the resources traded by the oil industry. This being the case, an element of non-neutrality remains in respect of the taxation treatment of oil producers. Charging oil producers for the capital cost of activity in proportion to production or any eventual profitability is inconsistent with the conditions imposed on ordinary commercial transactions. Royalties are an exception, yet these are usually set at strictly identifiable amounts which are negotiated between interested parties. Moreover, these charges are applied after cash bids have been made for the right to explore within the permit areas.
Oil producers are unable to make one capital payment for the right to use resources but are instead subject to onerous tax liabilities should any risk prone venture become successful. The eventual capital cost paid in secondary taxes at the end of a successful production project may be far in excess of the actual discounted value of the investment proposition prior to exploration when the associated uncertainties were first taken into consideration.

Oil projects are by their very nature, highly risky investments. Risk is inherent in a number of key elements of the profitability equation including the estimated oil reserves to be found, extraction capabilities, future oil prices, exchange rate fluctuations and political uncertainty of possible unfavourable short term changes to taxation policy. Therefore, this method of imposing the capital cost of oil production based on production rates or profitability discriminates unfairly against the oil industry as it imposes onerous liabilities which are unfairly weighted in favour of the Government, and are beyond what would could be described as ordinary commercial practice.

Nellor (1983, 302) described the situation where the community will suffer an aggregate welfare loss if specific taxes are imposed on the petroleum industry instead of the same revenue being raised by a broader based tax. This will arise when the imposition of discriminatory taxes interferes with investment choices within the petroleum industry as opposed to all other industries. However, this distortion would not arise if the additional taxation was in the nature of a charge for the economic rent enjoyed by the producer for his use of limited natural resources. Yet Nellor cites the inherent difficulties in measuring economic rents as a problem which will inevitably preclude this base from effective taxation. Potential income is not regarded as an operational tax base, and consequently, taxation will be related to economic activity which will give rise to economic inefficiencies.

A further issue arises as to the amount of entitlement of the community to returns from oil production (i.e. above normal company income taxation). It may be conteded that the extremely costly and risk prone exploration carried out by potential oil producers in locating oil reserves in commercially recoverable quantities, is payment enough for the proprietary rights vested in the geographic community. Without any oil exploration the community would have no indigenous oil reserves in the first place. Does the community have any right to compensation for depletion of oil reserves, that it bore no costs to develop and made no effort to locate. Returns do accrue to the community in the form of primary company income taxation but the case for secondary taxation is far less justified and may be deemed excessive at present levels.

The favourable treatment afforded to the gold mining industry in respect of resource taxation is in stark contrast to the petroleum sector and raises doubts about the integrity of the Government’s arguments in support of petroleum taxation (See Appendix 6).
Summation

If the accepted mode of secondary taxation is an effective measure of economic rents enjoyed by the oil producers, no excess burden will arise from its imposition and, in terms of horizontal equity, oil producers will not be unfairly treated. However, any tax in excess of economic rents will impose an excess burden on the community which will suffer an aggregate welfare loss when resources are diverted away from their most productive use. Moreover, channelling funds through Government redistributitional institutions is likely to aggravate any total community loss.

Yet economic rent is an inherently abstract concept and is extremely difficult to interpret in a practical sense. Neither the Government nor the industry have provided a sound rationale for charging the community’s entitlement, and therefore, proposals in support of, or against secondary taxation, and the mode in which it is applied, are difficult to sustain from either perspective. All sectors agree the community is entitled to returns, so an objectively based decision must be made. The more superior of the present alternatives must be Resource Rent Taxation because it measures economic rents in terms of actual returns to the producer. The value of any benefit can be best assessed in terms of the profit derived from trading in the petroleum commodities. Oil producers can successfully sustain an argument that no economic rents are enjoyed in an environment of low profitability. The presumption must be however, that an accurate measure of profits is adopted for this purpose and RRT in its present form does not provide it.

(1) Another viewpoint exists as to what ought to be the objective of energy taxation policy. Many regard oil conservation as the most important goal of policy making. See Appendix 7.
6. OTHER ECONOMIC CONSIDERATIONS

Oil industry taxation has implications beyond the scope of merely the economics of the petroleum industry. Due to the scale of production and a relatively inelastic economic demand for petroleum products industry activity has a significant impact on Australia’s balance of payments and even economic security.

Balance of Payments

The discovery of new oil reserves in recent years has failed to keep pace with consumption, resulting in a steady decline in Australia’s known reserves. Bass Strait production peaked in 1985 and is now falling. The Government and the industry agree that domestic crude oil production has begun its decline. Furthermore, lower world prices have the effect of reducing the level of commercially recoverable reserves as more costly development projects become uneconomic at low crude prices.

The immediate consequence of declining self-sufficiency on the Australian economy will be a substantial growth in the balance of payments deficit. This will arise when more oil is imported to meet the shortfall in domestic production. The timing of the fall in self-sufficiency could not have occurred at a worse time. Australia is currently experiencing an escalation of foreign debt and a dramatic deterioration in the terms of trade. This position has arisen even before the impact of our declining oil self-sufficiency has taken effect.

Continuing current account deficits result not only from our poor trading position but the high cost of servicing the debts previously incurred. Downward pressures on the Australian Dollar will persist, and inflation and interest rates will remain at their present high levels. The Federal Treasurer, Mr Paul Keating has made it quite clear that he will continue to pursue a monetary based offensive against our current account problem. His view is that excessive consumer demand is the cause of high import levels and is prepared to support even higher interest rates to "cool" economic activity and the demand for imports.

Whilst demand for imports is one aspect of the problem, the Treasurer is more than aware of other more deep seated problems contributing to our worsening international position. Australia’s small and relatively inefficient manufacturing sector will mean continued reliance on countries like Japan for manufactured products. Low commodity prices and the effect of U.S. trade subsidies, has reduced the impact of Australia’s traditional export base.
These structural problems experienced by the Australian economy are even more far reaching than the immediate problem of reducing consumer demand. The picture looks far worse when we consider the projected contribution yet to be made by the cost of additional oil imports.

A study performed by the National Institute of Economic and Industry Research indicated that oil imports could increase Australia’s current account deficit by as much as $14 billion (or 2.3% of the Gross Domestic Product) by the mid 1990s (A.P.E.A. 1989, 4). The dollar amount is expressed in 1996 terms. Australia’s ability to service debts of this scale is indeed questionable. The present Government has not devised a means of restraining foreign debt to levels which might be considered manageable.

A.P.E.A. (1989, 5) advocate a shift away from monetary to a more balanced mix of monetary and fiscal policies. The effect of higher interest rates is to make domestic commercial activity more costly than that of overseas competitors. It also inflates the exchange rate so that it is more difficult for explorers to compete overseas. Meanwhile a drop in Government expenditure commensurate with the easing of taxation levels on exporting industries will encourage exports.

Oil Prices

The Government has stated that the declining level of domestic oil supplies will be less of a problem if stable, reasonably priced international oil supplies are available. The outlook, however, points to the contrary. Oil analysts believe that Saudi Arabians will be in a position to control the world oil price by the early 1990s. This will arise when the major consumer, U.S.A., moves to import much of its needs (Orchison 1987, 8) and the North Sea reserves decline. A consequent sharp price rise seems inevitable as O.P.E.C. will eventually regain its former command over world markets.

Arty (1981, 88) examined the effect of the quadrupling of the price of oil by O.P.E.C. between late 1973 and early 1974. He observed significant effects on the world economy in 3 distinct areas:

1. Micro-economic effects on world employment and inflation in oil importing countries.

2. Problems posed by the financing of the unprecedented current account deficits of those importing countries.

3. The distribution of real world income amongst the world economies.

Australia’s domestic supplies, at the time of the shock, were of a scale which insulated the domestic economy from the severe economic impacts as experienced by many other import dependent nations.
However, as domestic reserves are depleted our future ability to remain removed from such price rises will be limited. The Government will be unable to retain economic stability when we consider the scale of previous controlled price rises and our present oil consumption patterns.

Higher oil prices do, however, have the effect of increasing our stock of commercially recoverable reserves as known marginal fields become economic at higher price levels. Yet the impact of these will be limited to those areas where a great deal of exploration work has already been performed and, if occurred today, would not significantly increase known Australian reserves. The development of synthetic fuels may also become attractive at higher prices, but present technologies do not make this a viable solution and the long lead times for such developments may postpone any immediate import relief.

National Security

The relatively low price of oil (pre-1973) in comparison with alternative energy sources has largely influenced Australia's present consumption pattern. The oil price shock of 1973/74 initiated the significant swing away from petroleum as an energy source but present consumption levels are still in the order of 40% of our total energy consumption (Energy 2000 1988, 11).

The Government has recognised the importance of the Australian economy moving away from petroleum to other energy sources which are in more abundant supply domestically (Energy 2000 1988, 4). A strategy which includes a greater proportional mix of gas and coal and a lower emphasis on petroleum is required if Australia is to have any degree of energy independence. However, the Government has also conceded that the transportation industry is still heavily reliant on petroleum. This has occurred because world suppliers of transport equipment have concentrated on the development and manufacture of petroleum powered vehicles and, when combined with current low oil prices, still make petroleum energy foremost in Australian transport consumption. Our capital stocks in the transport industry are powered largely by petroleum.

A severe problem will arise if oil prices rise dramatically or if supplies are cut off. If either of these were to occur, we will be left with an industry which will not function. Australia is extremely vulnerable in this situation because we have an economy which is dispersed over a wide geographic area. The Department of Primary Industries and Energy reports that oil still forms 51% of Australia's end use (as opposed to primary energy consumption) because of its substantial direct use in transportation and is expected to fall by only 3% to 48% by the year 2000. Therefore, the Government must recognise the need to retain a maximum level of domestic reserves. The only way to do this is to encourage exploration now with the hope that reserves are found and facilities are constructed to provide a continuing longer term supply. Given the length of time required to locate and develop oil reserves, there will be no short-term solution for the Government if overseas supplies are cut.
If we were to consider Australia’s position in an international conflict, imported oil would be unobtainable if military steps were taken to close our long and vulnerable sea routes. Australia would necessarily have to depend on domestic oil supplies or face economic stagnation. As such, the maintenance of domestic oil supplies as opposed to imported oil has obvious strategic importance to the defence of Australia as a nation.

The policies of the present Federal Government have the effect of discouraging oil exploration particularly when we consider the selective imposition of secondary taxation on the industry. Their actions may be viewed as irresponsible in light of the potential implications for national security.

The Prospectivity of Australia as an Oil Producer

Many writers have cited Australia’s relative lack of prospectivity for oil reserves as a valid reason for the removal of secondary taxation. Prospectivity refers to the estimated undiscovered crude oil reserves. A.P.E.A. (1987, 8) reports Australia’s prospectivity is much lower than most other producing countries and the exploration risks are therefore higher (Appendix 4.). Oil reserves are more difficult to find and greater expenditure is required to locate them. Higher exploration costs per unit discovery rate, have the effect of inducing lower returns from petroleum investments.

Of the oil discovered in Australia, most has been located in a small area of the Gippsland basin and despite efforts to locate oil elsewhere none has been found to compare with the scale of the Gippsland discoveries.

A.P.E.A. suggest that it follows that our tax regime should be lower than other countries to attract investment both domestically and from abroad. Australia’s relative taxation rate is regarded as medium when compared with other countries, however, given our low prospectivity the taxation rate is considered by A.P.E.A. to be too high.

Summation

The extent to which Australia’s decline in self-sufficiency will aggravate our already weak balance of payments position, will necessarily depend on future economic conditions. Not the least of which will be the prevailing oil price which is expected to rise. Price rises will be very difficult to predict if not determined by market forces (i.e. O.P.E.C.).

This analysis does, however, highlight the importance of retaining domestic reserves from both an economic and security point of view. The Government’s policy response to these conditions has been described as inappropriate and even contradictory (Bulletin 27 October, 1987)) when we consider the impact of secondary taxation on the incentives to explore for oil reserves. Moreover, Australia is considered to possess low prospectivity for undiscovered reserves when compared to other Western countries and therefore exploration costs are higher, even before the imposition of taxes is taken into account.
7. QUANTITATIVE ANALYSIS

We have examined many of the theoretical issues raised in the discussion of the most appropriate form of petroleum taxation policy. Arguments in support of the current level of taxation are based on the community's right to share in the depletion of its natural resources, whilst those in support of the relaxation of taxes call for an economic environment where returns are such that they will induce investment in petroleum activity. In terms of tax reform, the task at hand must inevitably be directed towards striking a suitable balance between these opposing, but not necessarily incompatible objectives. Clearly, in an environment of low world oil prices there is a smaller "cake" to be divided and taxation policy must tread a very fine line between what may be mutually exclusive objectives. At higher prices, however, the task is made easier.

A taxation policy is therefore required that is both suitable and flexible to cope with an inherently volatile oil environment. Any decision on tax reform cannot be made objectively by examining merely the theoretical issues, but must also be accompanied by sound quantitative analysis which will either support or counter the arguments raised.

To this end a model will be used to simulate the current economics of Australian offshore oil exploration and production. The model is intended to analyse the sensitivities of profitability to the alternative secondary tax regimes which prevail in the contemporary Australian setting. Whilst many of the parameters built into the model are based on assumptions which are subject to daily fluctuations, the direction of the results will be instructive as they pertain to petroleum tax reform (See Appendix B for the assumptions and parameters used in the model).

For the purposes of this exercise, it will be assumed that each petroleum project is a new discovery made in 1989. Therefore, the Excise system will be applied at the "New Oil" rates with a 30 MB Excise free threshold. RRT will be applied in its existing form.

Analysis is directed firstly towards the impact of the alternative tax regimes on the range of field sizes to be encountered from a large 143 MB (Million Barrel) field, to a 100 MB field, a 50 MB field, and finally, a small 14 MB field. Within each field size the project will be examined in isolation and then with full exploration costs, as will the effect of removing all secondary taxes or allowing full exploration deductibility under the RRT system.

The 143 MB field will then be subject to recalculation at a range of possible crude prices which may occur when world markets move or exchange rates fluctuate.

143 MB Field - Table 1. indicates there is only a small difference in profitability/ Government take under either regime when full exploration costs are taken into account. The mix of Government revenue under the RRT system will favour RRT as opposed to income tax. However, the total Government take is only 1.4% higher than the excise/royalty system when full exploration costs are included. Perhaps the Government designed RRT to be commensurate with the excise/royalty system on its introduction to Australia. Neutrality between the alternative systems may assist acceptance whilst manipulation of the RRT rate could be achieved if later desired.
Table 1. - 143 MB Field

<table>
<thead>
<tr>
<th>Excise/Royalty (A$M)</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income Tax</td>
<td>965.2</td>
<td>827.5</td>
<td>1,269.8</td>
</tr>
<tr>
<td>Excise</td>
<td>655.0</td>
<td>655.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Royalty</td>
<td>479.0</td>
<td>479.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total Government Take</strong></td>
<td><strong>2,099.2</strong></td>
<td><strong>1,961.5</strong></td>
<td><strong>1,269.8</strong></td>
</tr>
<tr>
<td>Percnt (%) of Tot Profit</td>
<td>(58.2)</td>
<td>(60.2)</td>
<td>(39.0)</td>
</tr>
<tr>
<td>Net Cash Flow to Prod</td>
<td>1,510.5</td>
<td>1,295.2</td>
<td>1,986.8</td>
</tr>
<tr>
<td>IRR (%)</td>
<td>(32.5)</td>
<td>(18.5)</td>
<td>(24.8)</td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
<td>3,609.7</td>
<td>3,256.7</td>
<td>3,256.6</td>
</tr>
</tbody>
</table>

(Diagram 1.)

<table>
<thead>
<tr>
<th>Resource Rent Tax</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income Tax</td>
<td>896.0</td>
<td>799.8</td>
<td>1,269.8</td>
<td>1,035.8</td>
</tr>
<tr>
<td>RRT</td>
<td>1,311.4</td>
<td>1,204.9</td>
<td>0.0</td>
<td>599.9</td>
</tr>
<tr>
<td><strong>Total Government Take</strong></td>
<td><strong>2,207.4</strong></td>
<td><strong>2,004.7</strong></td>
<td><strong>1,269.8</strong></td>
<td><strong>1,635.7</strong></td>
</tr>
<tr>
<td>Percnt (%) of Tot Profit</td>
<td>(61.2)</td>
<td>(61.6)</td>
<td>(39.0)</td>
<td>(50.2)</td>
</tr>
<tr>
<td>Net Cash Flow to Prod</td>
<td>1,402.2</td>
<td>1,251.9</td>
<td>1,986.8</td>
<td>1,620.9</td>
</tr>
<tr>
<td>IRR (%)</td>
<td>(37.1)</td>
<td>(19.8)</td>
<td>(24.8)</td>
<td>(23.5)</td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
<td>3,609.6</td>
<td>3,256.6</td>
<td>3,256.6</td>
<td>3,256.6</td>
</tr>
</tbody>
</table>

(Diagram 2.)

Explanation of Test Cases:

**Test 1** - Is the single petroleum project in isolation without considering the cost of unsuccessful wells required before this discovery was made.

**Test 2** - Includes the estimated cost of 49 unsuccessful offshore wells prior to this successful discovery (Base Case).

**Test 3** - Excludes all secondary taxes (Excise/Royalty and RRT).

**Test 4** - Reworks the RRT calculation on the assumption that all exploration drilling is deductible for RRT purposes, even those wells drilled outside the immediate exploration permit area.
**Full Exploration Costs**  - What is significant to note from the data is the sensitivity of returns to the producer when all exploration costs are considered. A major criticism of Government policy is an apparent failure to recognise the full exploration effort in locating commercial quantities of hydrocarbons.

The success rate for offshore exploration wells in Australia is 2% (A.P.E.A. 1987, 15). Therefore, we can assume that 49 unsuccessful wells have been drilled before this successful case. If the average cost of an offshore well is A$M 7.2 (Energy 2000 1988, 47) then an additional cost of A$M 353 would have been spent on exploration prior to this discovery. When these costs are included in the analysis the Internal Rate of Return (IRR) of the total exploration project drops by 14.0% under the excise/royalty system and 17.3% under RRT. It is assumed for RRT purposes that 10 of the additional wells are within the same exploration permit, and therefore, deductible from RRT defined taxable income.

The argument contended by the industry that the most crucial investment decision is made at the exploration stage, and not at production, is borne out by the analysis. RRT and, even more so, Excise/Royalty have a severe impact on profitability at the exploration stage. Returns of merely 18.5% or 19.8% are insufficient to induce an oil producer to consider exploration when his cost of capital is approximately 25.0% (see Appendix 8.). The high cost of capital is indicative of the risky nature of the business.

Full deductibility of exploration under the RRT system would bring returns up to 23.5% which is much closer to the hurdle rate required for a producer to make the decision to invest in exploration.

Furthermore, the data demonstrates the sensitivity of profitability to the producer’s decision to explore within an existing RRT paying area, as opposed to a new area where RRT is not presently being paid. The IRR of the large field project is 3.7% higher in the case where full exploration expenditure can be offset against other RRT income. Therefore, the producer’s decision to explore will be influenced by the better returns to be made in the RRT area as opposed to the prospect which may hold the best geological potential.

**100 MB Field**  - The results for the 100 MB field are consistent with those of the 143 MB field. When full exploration costs are included in the analysis (Test 2) the RRT regime places a slightly lower tax burden on the oil producer than the Excise/Royalty system. The lower returns reflect the higher per barrel capital costs associated with the development this smaller fields. The larger the oil field, the more economies of scale available to the producer. Again, the rates of return required by the producer are approached only when secondary taxes are removed (22.2%) or full exploration deductibility is available under RRT (22.0%).
<table>
<thead>
<tr>
<th>Table 2. - 100 MB Field</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Excise/Royalty (A$M)</strong></td>
</tr>
<tr>
<td>Income Tax</td>
</tr>
<tr>
<td>Excise</td>
</tr>
<tr>
<td>Royalty</td>
</tr>
<tr>
<td>Total Government Take</td>
</tr>
<tr>
<td>Percet (%) of Tot Profit</td>
</tr>
<tr>
<td>Net Cash Flow to Prod</td>
</tr>
<tr>
<td>IRR (%)</td>
</tr>
<tr>
<td>Total Income</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource Rent Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test 1</strong></td>
</tr>
<tr>
<td>Income Tax</td>
</tr>
<tr>
<td>RRT</td>
</tr>
<tr>
<td>Total Government Take</td>
</tr>
<tr>
<td>Percet (%) of Tot Profit</td>
</tr>
<tr>
<td>Net Cash Flow to Prod</td>
</tr>
<tr>
<td>IRR (%)</td>
</tr>
<tr>
<td>Total Income</td>
</tr>
</tbody>
</table>

Explanation of Test Cases - as per 143 MB field.
50 MB Field – The analysis applied to the 50 MB field (Table 3.) supports the Government’s contention that RRT, as opposed to the Excise/Royalty system, will encourage the development of smaller marginally profitable fields. Returns are 3.1% higher for the project in isolation or 2.4% when full exploration costs are included. This is because RRT is applied after at least some measure of profitability has been considered whereas Excise, and Royalties in particular, are charged regardless of actual profitability. This aspect is a fundamental shortcoming of Excise and Royalties. They lack flexibility to successfully move to maintain the balance between Government revenue and the incentives for producer exploration and development.

One might observe that the low rates of return after full exploration costs will not necessarily mean that the fields will not be developed. Oil producers will have commenced exploration in search of larger fields such as those of the 143 MB or 100 MB reserves. If smaller fields such as this one are located during exploration, the explorer may seek to recover some of its prior losses by development. Since the exploration decision has previously been made the decision to develop this field will be subject to the analysis of Test 1 where higher returns are calculated when this project is considered in isolation. Earlier unsuccessful exploration costs will not form part of the development decision.

Yet this does not negate the previous observation that the most important investment decision is made prior to exploration. The economics of the entire system must yield returns sufficient to encourage the producer to engage in exploration otherwise development decisions such as this one will not even arise.

14 MB Field – For the 14 MB field (Table 4.) the conclusions made in respect of 50 MB field are the same. The results strongly favour the RRT regime as opposed to Excise/Royalty from the producer’s position. It is unlikely, however, that this field will be developed as the return is only 7.6% or 9.7% even when only income tax is applied and no external exploration costs are considered.
### Table 3. - 50 MB Field

<table>
<thead>
<tr>
<th>Excise/Royalty (A$M)</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income Tax</td>
<td>248.2</td>
<td>192.0</td>
<td>246.7</td>
</tr>
<tr>
<td>Excise</td>
<td>8.6</td>
<td>8.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Royalty</td>
<td>131.8</td>
<td>131.8</td>
<td>0.0</td>
</tr>
</tbody>
</table>

| Total Government Take   | 388.6  | 332.4  | 246.7  |
| Perct (%) of Tot Profit | (50.0) | (52.5) | (39.0) |
| Net Cash Flow to Prod.  | 388.3  | 300.5  | 386.2  |
| IRR (%)                 | (16.2) | (9.7)  | (12.1) |

**Total Income**

<table>
<thead>
<tr>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>776.9</td>
<td>632.9</td>
<td>632.9</td>
<td>632.9</td>
</tr>
</tbody>
</table>

**Resource Rent Tax**

<table>
<thead>
<tr>
<th>Income Tax</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRT</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

| Total Government Take | 302.9  | 246.7  | 246.7  | 246.7  |
| Perct (%) of Tot Profit | (39.0) | (39.0) | (39.0) | (39.0) |
| Net Cash Flow to Prod. | 474.0  | 386.2  | 386.2  | 386.2  |
| IRR (%)             | (19.3) | (12.1) | (12.1) | (12.1) |

**Total Income**

<table>
<thead>
<tr>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>776.9</td>
<td>632.9</td>
<td>632.9</td>
<td>632.9</td>
</tr>
</tbody>
</table>

**Explanation of Test Cases** - as per 143 MB field.
Table 4. - 14 MB Field

<table>
<thead>
<tr>
<th>Excise/Royalty (A$M)</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income Tax</td>
<td>36.4</td>
<td>(19.7)</td>
<td>(10.3)</td>
</tr>
<tr>
<td>Excise</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Royalty</td>
<td>24.2</td>
<td>24.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Total Government Take</td>
<td>60.6</td>
<td>4.5</td>
<td>(10.3)</td>
</tr>
<tr>
<td>Perct (%) of Tot Profit</td>
<td>(51.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Cash Flow to Prod</td>
<td>57.0</td>
<td>(30.9)</td>
<td>(16.1)</td>
</tr>
<tr>
<td>IRR (%)</td>
<td>(7.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
<td>117.6</td>
<td>(26.4)</td>
<td>(26.4)</td>
</tr>
</tbody>
</table>

Resource Rent Tax

<table>
<thead>
<tr>
<th></th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income Tax</td>
<td>45.8</td>
<td>(10.3)</td>
<td>(10.3)</td>
<td>(10.3)</td>
</tr>
<tr>
<td>RRT</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total Government Take</td>
<td>45.8</td>
<td>(10.3)</td>
<td>(10.3)</td>
<td>(10.3)</td>
</tr>
<tr>
<td>Perct (%) of Tot Profit</td>
<td>(39.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Cash Flow to Prod</td>
<td>71.8</td>
<td>(16.1)</td>
<td>(16.1)</td>
<td>(16.1)</td>
</tr>
<tr>
<td>IRR (%)</td>
<td>9.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Income</td>
<td>117.6</td>
<td>(26.4)</td>
<td>(26.4)</td>
<td>(26.4)</td>
</tr>
</tbody>
</table>

Explanation of Test Cases - as per 143 MB field.
Oil Price Variations - At higher oil prices (Table 5) the IRR, under either regime, remains remarkably consistent. However, as prices rise the comparative advantage for the producer under the RRT regime is lost to that of the Excise/Royalty system. At lower prices RRT will be favoured yet at higher prices the balance will shift to Excise/Royalty. The equilibrium point is at the A$ 35 price per barrel (Refer to Diagram 3). Note that the percentage of total Government take is consistently higher under the RRT system whilst the IRR remains relatively constant. This indicates that the timing of positive cash flows under RRT is better than that of Excise/Royalty, but the nominal value of cash flows to the producer are greater under the Excise/Royalty system.

At first glance one would have expected RRT to attract even greater portions of returns as profitability rises. This is because it is a so called "profits based" tax. Yet in reality we find that the impact of positive adjustments to past year expenditures under RRT and the fact that both Excise and Royalty are calculated using actual selling values; the impact of the alternative systems is very similar.

This analysis supports the use of RRT from the Government’s point of view. At low returns RRT will impose a lower cost on the producer and so will encourage development. Yet as returns rise RRT assumes a greater share of profits which are beyond the level required to induce the producer’s activity. It is for this reason the RRT mechanism is a more suitable form of taxation for the oil industry than the alternative Excise/Royalty system.
Table 5. - The impact of market selling prices on profitability/taxation on the 143 MB field.

<table>
<thead>
<tr>
<th>Excise/Royalty (A$M)</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income Tax</td>
<td>569.8</td>
<td>1,085.7</td>
<td>1,342.6</td>
<td>1,858.3</td>
</tr>
<tr>
<td>Excise</td>
<td>520.3</td>
<td>789.6</td>
<td>923.9</td>
<td>1,193.2</td>
</tr>
<tr>
<td>Royalty</td>
<td>365.2</td>
<td>592.7</td>
<td>706.0</td>
<td>933.4</td>
</tr>
<tr>
<td><strong>Total Government Take</strong></td>
<td><strong>1,455.3</strong></td>
<td><strong>2,468.0</strong></td>
<td><strong>2,972.5</strong></td>
<td><strong>3,984.9</strong></td>
</tr>
<tr>
<td>Perc (%) of Tot Profit</td>
<td>(62.0)</td>
<td>(59.2)</td>
<td>(58.6)</td>
<td>(57.8)</td>
</tr>
<tr>
<td>Net Cash Flow to Prodr</td>
<td>891.4</td>
<td>1,698.4</td>
<td>2,100.6</td>
<td>2,907.3</td>
</tr>
<tr>
<td>IRR (%)</td>
<td>(14.3)</td>
<td>(22.1)</td>
<td>(25.2)</td>
<td>(30.7)</td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
<td>2,346.7</td>
<td>4,166.4</td>
<td>5,073.1</td>
<td>6,892.2</td>
</tr>
</tbody>
</table>

Resource Rent Tax

<table>
<thead>
<tr>
<th>Income Tax</th>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRT</td>
<td>600.0</td>
<td>1,008.9</td>
<td>1,217.4</td>
<td>1,636.2</td>
</tr>
<tr>
<td><strong>Total Government Take</strong></td>
<td><strong>1,409.2</strong></td>
<td><strong>2,588.0</strong></td>
<td><strong>3,167.9</strong></td>
<td><strong>4,331.9</strong></td>
</tr>
<tr>
<td>Perc (%) of Tot Profit</td>
<td>(60.0)</td>
<td>(62.1)</td>
<td>(62.4)</td>
<td>(62.9)</td>
</tr>
<tr>
<td>Net Cash Flow to Prodr</td>
<td>938.5</td>
<td>1,578.4</td>
<td>1,905.2</td>
<td>2,560.3</td>
</tr>
<tr>
<td>IRR (%)</td>
<td>(16.4)</td>
<td>(22.9)</td>
<td>(25.6)</td>
<td>(30.4)</td>
</tr>
<tr>
<td><strong>Total Income</strong></td>
<td>2,346.7</td>
<td>4,166.4</td>
<td>5,073.1</td>
<td>6,892.2</td>
</tr>
</tbody>
</table>

Explanation of Test Cases:

**Test 1** - Base case for the 143 MB field including full exploration costs at a selling price reduction of A$ 5 (or 20.5%).

**Test 2** - As per Test 1 with an increase of A$ 5 (or 20.5%) in the selling price.

**Test 3** - As per Test 1 with an increase of A$ 10 (or 41.1%) in the selling price.

**Test 4** - As per Test 1 with an increase of A$ 20 (or 82.2%) in the selling price.

Diagram 3. - Returns to the Producer at varying crude prices for the 143 MB field.
8. CONCLUSION - PETROLEUM TAX REFORM

The objective of this paper has been to examine the effect of the range of taxes which are imposed on the petroleum industry.

Of all of the taxes, income tax is the least negotiable in tax reform because of its general application to all Australian industries. Income tax is usually considered the base structure upon which secondary taxes are imposed. The oil producer is afforded favourable treatment under income taxation due to special depreciation concessions which have the effect of increasing the present value of tax savings. Opportunities to reduce income tax were also identified in the alternative means of business finance, and the retention of profits within a company, instead of paying dividends to shareholders. However, it is difficult to isolate the impact of these items as they affect the economics of petroleum investment decisions. Also they are not the focus of attention when we consider the more significant issues relating to secondary taxation. As a tax on profit, income tax is otherwise neutral in respect of petroleum decision making. The measure of income, although not perfect, is better than that defined by the Resource Rent Tax system.

Within the realms of secondary taxation, excise is a precarious performer requiring continual modifications and compromise to maintain the balance between Government revenue and industry returns. As a system it fails to meet the range of investment circumstances encountered by producers such as low oil prices and smaller development proposals. Suffering from the absence of a sound underlying rationale, this tax has created an environment of uncertainty in those areas in which it applies. The cost of which is necessarily reflected in the willingness of oil producers to pursue potential investments which are vulnerable to an element of political risk. These would include the more marginally profitable projects, with long lead times between development and eventual production. Taxation based on production rates, without an adequate measure of profitability, will always fail in the volatile oil environment.

Royalties suffer largely from the same problem. Some consideration is made for actual profitability when certain costs are allowable deductions against income for the purposes of calculating royalties. However, these are limited to the extent where royalties are charged even where very small profits are made. Again, because of its lack of flexibility to meet the many varied conditions, royalties in their present form are unsuitable as a system for taxing oil production.

Whilst this paper has identified fundamental flaws in the application of RRT in the Australian setting its ultimate financial impact on the profitability of petroleum projects is slightly better for large fields and significantly better for small/marginal fields at current world crude prices. This is because Excise and Royalty ignore profitability, while RRT is imposed after at least a modified measure of profitability has been considered. The RRT mechanism performed better in respect of smaller fields and low oil prices. In both situations the producer is faced with a very close decision as to whether to commence development or not. In such cases RRT imposes a lower cost and will therefore encourage investment.
Yet at current world prices, it is only by the removal of either secondary tax system, that profitability can be restored to the industry. If one were to accept the premise that producers are primarily in search of large oil fields, then the financial returns sought will only approach the cost of raising capital when only income tax is imposed (See Table 1). This will reduce the Government take by 21.2% of the total revenue generated by a large field under the Excise/Royalty system, and 22.6% under the RRT system. It is unlikely that the Government will forgo this revenue unless forced to by exogenous circumstances, other than by industry profitability.

This paper also examined some of the more qualitative issues associated with the taxation of the oil industry. Although the conceptual basis for, and the existing mechanisms of community returns are questionable, one cannot deny that the general community ought to share in returns of oil production above those which provide adequate industry incentives. The inability to measure the economic benefits derived by oil producers should not preclude the community from receiving any benefit. A system of collection, although not perfect, must be applied. By default, secondary taxation under the present modes could be adopted so long as returns are measured after all costs have been recovered and an adequate margin for profit commensurate with industry risk. In the low oil price environment, however, the maintenance of industry profitability must take precedence over returns to the community beyond those of income taxation. Common sense will indicate that no one will benefit if exploration activity ceases. The excise/royalty system is inappropriate at low prices because it does not fall at the same rate as profitability. Excess returns may accrue to producers if the oil price were to recover substantially. In which case, a secondary taxation should be considered to ensure the community shares in any abnormally high returns that may accrue to producers for their exploitation of natural resources.

However, at current low prices and relatively high taxation levels, we have demonstrated that there is little incentive for oil exploration in the Australian environment. If new reserves are not located and developed, Australia will become increasingly dependent on imported oil to meet the short-falls between domestic production and projected oil consumption. This situation will aggravate our ailing balance of payments position and has serious strategic implications for national security. As a short term measure the absence of secondary taxes will restore industry profitability, but this would be an unsuitable policy to sustain in the longer term. If oil prices were to rise, the community ought to share in any excess profits (or economic rents) derived by the industry.

The most desirable option would be to change the RRT base to include full deductibility of all exploration costs. It is contended that this will enhance the RRT tax base, while quantitative analysis demonstrates full deductibility will restore current profitability to a level which approaches the returns required by the industry. At higher prices this modified RRT mechanism will also ensure that the community will assume a greater share of the increasing returns.
It was determined that actual profitability is the only suitable measure of economic rents enjoyed by the producers, and therefore, the community's entitlement should only be charged with reference to this value. Any business related expenditure excluded from the profit calculation will subvert the effective measure of economic rents conferred upon the producer. It is submitted that such a secondary taxation mechanism will better maintain the balance between industry profitability and the enforcement of the community's entitlement.

What becomes increasingly obvious is that the prescribed changes are moving RRT closer to the more superior definition of "profit" under income tax legislation. Yet the income tax definition lacks an allowance for the effects of inflation on the depreciation of capital expenditure and carried forward losses which have received more appropriate treatment under RRT. Clearly, opportunities exist for tax reform under either mode of legislation but the obvious solution would be to tax the petroleum industry under an improved income tax system alone.

Aside from economic issues the Federal Government has failed to coordinate its revenue raising activities and has introduced RRT without using the existing mechanisms available for collecting income tax. Unnecessary administrative and compliance costs have been imposed as the new legislation has redefined concepts of taxable income and the supporting systems, all of which could have been achieved through an increment to the income tax rate for petroleum sourced income.

In closing, it is more than apparent that oil industry taxation is in need of reform, particularly in the present economic environment. In terms of oil reserves, Australia is now poised at a turning point in regard to self sufficiency and the direction of future stocks will depend on the opportunities taken now. Oil taxation policy must reflect the critical importance of retaining domestic reserves. Reform, in the manner suggested, will benefit both the community and oil producers in the longer term. In the short term the cost will be felt in lower Government revenue. However, it is hoped that the policy makers will have the foresight and courage to sacrifice any immediate expenditure restraint, in the longer term interests of the community.
Bibliography


Appendix 1. - Petroleum Industry Income Tax Concessions

The concessions available to the petroleum industry are in the form of extensive capital expenditure deductions for the cost of exploration, and to some extent deductions associated with the costs of production. Deductions in the form of depreciation are generally available for plant and equipment, however capital expenditure for items such as permit bidding and exploration well costs would not otherwise be deductible for income tax purposes.

Under Div. 10AA (sec. 124-124AR) of the I.T.A.A. deductions are allowed in respect of "prescribed petroleum operations". "Prescribed petroleum operations" are defined by sec. 124 to mean mining operations in Australia for the purpose of obtaining petroleum. Australia in this context includes operations carried out offshore on the Australian continental shelf.

All capital expenditure incurred by a well operator in carrying prescribed petroleum operations qualifies as "allowable capital expenditure" unless expressly excluded by the Act. Expressed inclusions are expenditure on:

- Buildings and other improvements necessary for carrying on the operations and the associated costs of providing water, light, power, access and communications to the well site. The cost of residential accommodation and other amenities for employees also qualify for deduction.
- Petroleum pipelines, terminal facilities and road vehicles for use primarily in petroleum mining operations.
- Transport facilities used primarily in transporting unrefined petroleum from the site of operations.
- Construction or acquisition of port facilities, earthworks, bridges and tunnels. Harbour surveys, dredging of a harbour or channel, navigational aids etc.

Plant used in the refining of petroleum or petroleum products are excluded.

Allowable capital expenditure is deductible by the lower of 10 years or the life of the field on a linear basis. This means that a deduction may be claimed for the capital costs in equal instalments over the lesser of 10 years or the life of the field. Deductions of this nature may be transferred to other companies within the same corporate group.

Petroleum exploration or prospecting expenditure is deductible. The meaning of "exploration or prospecting" is drafted very widely to capture most expenditure items involved in prospect mapping, surveying and appraisal drilling; geological, geophysical and geochemical surveys. Expressly excluded is development drilling or operations in the course of working a petroleum field.

The Act also confers deductions for cash bids paid to Federal or State Government bodies for the award of offshore petroleum exploration permits or production licences. Cash bids are treated as development expenditure for the purposes of the petroleum mining provisions and so may be depreciated in the manner described above for allowable capital expenditure from the year in which a production licence is granted for the permit area.
### Appendix 2. Energy demand by major fuel type, Australia

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<td>Electricity</td>
<td>457</td>
<td>9.6</td>
<td>13.4</td>
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**Note:** Totals of the percentage shares will exceed 100 per cent due to the double counting effect where some fuels are used to produce others i.e. black coal to produce electricity.

Appendix 3. - Crude oil excise rates from July 1, 1989.

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<th>Production Rate ML/yr</th>
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<th>Marginal Excise Rates</th>
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<td></td>
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<tr>
<td></td>
<td>50 - 100</td>
<td>0.315 - 0.629</td>
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<tr>
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<td>800 +</td>
<td>5.034 +</td>
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Appendix 4. - Discovered oil and prospective area.

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<th>Country</th>
<th>Oil Discoveries End 1982 Million BBLs</th>
<th>Prospective Area K.SQ Miles</th>
<th>Oil Discovered Per Prosp. Area BBLs\kms 2</th>
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<tr>
<td>Australia</td>
<td>3,472</td>
<td>2,370</td>
<td>560</td>
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<tr>
<td>U.K.</td>
<td>17,219</td>
<td>227</td>
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<td>Norway</td>
<td>7,907</td>
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<td>U.S.A.</td>
<td>173,806</td>
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<td>Indonesia</td>
<td>20,167</td>
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<td>Germany</td>
<td>116</td>
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Appendix 5. — Energy 2000 — the Government’s response to representations made by the Oil Industry in respect of taxation policy.

The Energy 2000 document (1988, 53) simply states:

The Government believes RRT meets two fundamental requirements of a taxation regime: efficiency and equity.

In respect of the excise regime the Government refers to the introduction of the 30 MB excise free threshold as providing the impetus for a significant upturn in exploration activity.

The Government’s response to the position of the oil industry has clearly failed to address the key issues raised concerning the disincentives imposed by secondary taxation.

It is curious to note that both the Government and the industry site the statistics on exploration activity in support of their contrary points of view. The Government does concede that their has been a downturn activity but suggests that has been largely in response to falling world crude prices and not taxation policy. In fact, it is satisfied with the level of activity when compared with similar trends being experienced by other countries since the world price collapse.

The industry, on the other hand, suggest that falling world prices are all the more reason for Australia to relax its taxation levels. Furthermore, it contends that any immediate signs of recovery are driven by permit drilling requirements and concentrated exploration efforts rather than any change in the perception of industry profitability.

Senator Peter Cook, Minister for Resources, in a statement made on 24 April, 1989, quite appropriately made reference to the financial interests of the oil explorers in advancing their position yet failed to mention the financial interests of the Government in the same manner.

Furthermore, it was inappropriate for him to suggest that in response to the call for the relaxation of taxation levels ".... the industry cannot guarantee a greater exploration effort, nor can they guarantee positive exploration results." This is an extraordinary statement for the Minister to make when we consider that the oil companies will bear all the risks of exploration without any contribution from the Government and if successful the Government will help itself to up to 86% of the profits generated by the ventures.
Appendix 6. - Horizontal Equity - The case of the Gold Mining Industry.

The Government's position, as stated earlier is that petroleum resources are community property and it believes that the community as a whole should share in the potentially high returns from the exploitation of these scarce, non-renewable resources (Mr Kerin, Second Reading 21/10/87). The community's share of the exploitation is received in the form of secondary taxation.

If we were to turn our attention to the Gold Mining industry we would find the Government does not hold this view for all "scarce, non-renewable resources". In fact, not only is secondary taxation non-existent but primary income taxation has not yet been levied on the profits generated by gold production.

Under section 23(o) of the Income Tax Assessment a mine operator is exempt from tax on all income resulting from working a gold mining property in Australia. To secure this exemption the operator need only meet certain tests in respect of the proportion of gold output to other minerals such as copper which are commonly found in gold bearing geological formations. This exemption ceases in January, 1991.

What is significant, however, is the Government's stated reasons for deferring the introduction of income taxation in a joint statement issued on December 16, 1986, given by the Federal Treasurer, Paul Keating, and the then Resources and Energy Minister, Senator Gareth Evans:

The importance of encouraging active exploration and development and of maximising production and the consequent export income generated by the gold mining industry outweigh the arguments in favour of removing the industry's long standing tax exemption.

Oil producer, Esso (1987, 5), has pointed out that implicit in this statement is an acknowledgement that taxation is a disincentive to an optimum level of exploration. This is a key argument of the gold exploration industry but one not acknowledged by the Government in relation to petroleum.

Not only gold but all other mining industries are not subject to secondary taxation which has been imposed on the oil industry. Clearly, this inconsistent approach raises serious doubts as to the equality of contemporary taxation of the oil industry and the soundness of the Government's arguments in support its taxation policies.
Appendix 7. – An alternate energy/taxation policy of oil conservation.

An alternate oil/taxation policy can be taken from a broader view that our current oil reserves should be conserved, and immediate domestic demand should be met by imports at the prevailing low price levels. This will reduce reliance on future exploration to maintain reserve levels. Oil conservation was, in fact, one of the stated reasons in support of the introduction of crude oil excise in 1975. Yet the impact of either secondary tax regime has a significant positive effect on the domestic selling price of oil and, will therefore, encourage oil conservation to the extent that oil demand is sensitive to price rises. Conservation of present oil stocks is contended as a means of ensuring energy security.

In reality such a policy does not seem likely in the present political/economic environment. This is because both the Government and industry require immediate cash inflow from the sales of oil. Therefore this policy, whilst it may be in the best interests of the community, is not carried as a viable option in the discussion of taxation and petroleum policy making.
Appendix 8. - Simulated economics re the impact of the various forms of taxation were based on the following assumptions/parameters. All production and technical data has been provided by industry sources.

143 MB Field

1. Field Size - 143 MB which would be produced over a period of 18 years starting from Year 4 at high rates in the earlier years and decreasing exponentially as field pressure reduces and larger amounts of water are extracted with the petroleum.

2. Market Selling Price - Although extremely difficult to predict with any certainty this paper will carry the prevailing price of approximately US$ 18.50 per barrel (West Texas Intermediate, July 26, 1989) converted at an exchange rate of 0.7600 giving a initial price of A$ 24.34. The nominal price is expected to rise at a rate of 6% per annum.

3. Capital costs of exploration and development are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
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<tr>
<td>22</td>
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<td>65</td>
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</table>

4. Operating costs assumed to be A$M 8 for each year of production rising at a domestic rate of inflation of 7.5% for each year after year 4. Costs are expected to be A$M 1 Upstream of the wellhead and A$M 7 Downstream of the wellhead.

5. Income Taxation will be imposed under the prevailing law at the corporate tax rate of 39% of taxable income. There is a 1 year lag between income and the payment of tax in respect of that income. The benefit of tax credits are realised in the year incurred as it will be assumed that they are offset against other sources of income.

6. Excise Regime - The field will be treated as if it were a discreet oil accumulation discovered at the date of this paper. New oil rates of excise will be imposed with the 30 MB excise free threshold.

7. Royalty - Is imposed in accordance with the Bass Strait system at a total rate of 12 1/2% for primary and secondary production licences.
8. Petroleum Resource Rent Tax - Is applied under the prevailing law at the rate of 40% on RRT defined taxable profits. Non RRT deductible operating costs include an amount of $0.50 per barrel for administration costs. All other operating costs are considered deductible for RRT purposes.

The Augmented Bond rate was taken at 24% and the GDP factor rate at 5%.

9. Cost of Capital – For the purposes of profitability analysis all projected cash flows will be discounted at a cost of capital rate of 25%. The cost of capital for an Australian Petroleum Company is derived by taking the prevailing secured interest rates of 20% (Westpac Overdraft Rate 14/7/89) plus a premium to reflect the risky nature of oil exploration activities of 5%. This rate was verified by an Australian oil producer.

100 MB Field

1. Field Size – 100 MB which would be produced over a period of 18 years starting from Year 4 at high rates in the earlier years and decreasing exponentially as field pressure reduces and larger amounts of water are extracted with the petroleum.

2. Market Selling Price – As per the 143 MB Field.

3. Capital costs of exploration and development are as follows:

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<tr>
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<th>Description</th>
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<td>8.0</td>
</tr>
<tr>
<td>22</td>
<td>Platform Removal</td>
<td>51.7</td>
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4. Operating costs assumed to be A$M 6 for each year of production rising at a domestic rate of inflation of 7.5% for each year after year 4. Costs are expected to be A$M 0.6 Upstream of the wellhead and A$M 5.4 Downstream of the wellhead.

5. Income Taxation – As per the 143 MB Field.

6. Excise Regime – As per the 143 MB Field.

7. Royalty – As per the 143 MB Field.

8. Petroleum Resource Rent Tax – As per the 143 MB Field.

9. Cost of Capital – As per the 143 MB Field.
50 MB Field

1. Field Size - 50 MB which would be produced over a period of 17 years starting from Year 3 at high rates in the earlier years and decreasing exponentially as field pressure reduces and larger amounts of water are extracted with the petroleum. The higher than proportional capital costs of this field arise because it is assumed that the oil reserve is located in deeper water than the other fields.

2. Market Selling Price - As per the 143 MB Field.

3. Capital costs of exploration and development are as follows:

<table>
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<tr>
<th>Year</th>
<th>Description</th>
<th>Amount A$M</th>
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<td>Platform materials</td>
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<td>1</td>
<td>Onshore Construction</td>
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<td>21</td>
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4. Operating costs assumed to be A$M 6 for each year of production rising at a domestic rate of inflation of 7.5% for each year after year 4. Costs are expected to be A$M 0.6 Upstream of the wellhead and A$M 5.4 Downstream of the wellhead.

5. Income Taxation - As per the 143 MB Field.

6. Excise Regime - As per the 143 MB Field.

7. Royalty - As per the 143 MB Field.

8. Petroleum Resource Rent Tax - As per the 143 MB Field.

9. Cost of Capital - As per the 143 MB Field.

14.2 MB Field

1. Field Size - 14.2 MB which would be produced over a period of 17 years starting from Year 3 at high rates in the earlier years and decreasing exponentially as field pressure reduces and larger amounts of water are extracted with the petroleum.

2. Market Selling Price - As per the 143 MB field.
3. Capital costs of exploration and development are as follows:

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<th>Year</th>
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<tr>
<td>21</td>
<td>Platform Removal</td>
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4. Operating costs assumed to be A$M 3 for each year of production rising at a domestic rate of inflation of 7.5% for each year after year 4. Costs are expected to be A$M 0.3 Upstream of the wellhead and A$M 2.7 Downstream of the wellhead.

5. Income Taxation - As per the 143 MB Field.

6. Excise Regime - As per the 143 MB Field.

7. Royalty - As per the 143 MB Field.

8. Petroleum Resource Rent Tax - As per the 143 MB Field.

9. Cost of Capital - As per the 143 MB Field.
DIAGRAM 2. - The cash flow of a large oil field project under the RRT system.

- The cash flow is depicted on a graph with the x-axis representing years (2005-2025) and the y-axis representing A$ millions. The graph shows multiple lines indicating different cash flow components such as net cash flow to the producer (Net Cash Flow to the Prod') and income tax (Income Tax).
The Taxation of the Offshore Oil Industry

- Dominic Smith
PLEASE NOTE

The greatest amount of care has been taken while scanning this thesis,

and the best possible result has been obtained.
18 November, 1989

Dominic Scott Smith
56 Helena Street
Auburn N.S.W. 2144

To the School Graduate Committee,

This is to certify that this work has not been submitted for an award at another institution.

[Signature]

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Supervisors: Terry Alchin and Mac Collings
Course: Master of Business - Taxation (I066X)
Unit No: 58001
Unit Name: Taxation Thesis

Topic: The Taxation of the Offshore Oil Industry.
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List of Abbreviations

A$M – Australian Dollar Millions.
IRR – Internal Rate of Return.
KBD – Production rate measured in units of one thousand
   barrels per day.
MB – Million Barrels.
RRT – Resource Rent Tax.
SND – Substantial New Development.