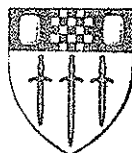


# UK Oil Taxation: Failings and Reform

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**UK OIL TAXATION: FAILINGS AND REFORM**

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## UK OIL TAXATION: FAILINGS AND REFORM

### 1.0 INTRODUCTION

Profits on North Sea oil extraction are subject to a plethora of tax regulations. This paper is concerned with the consequences of these regulations.

In May 1982, the Select Committee on Energy expressed some concern that the North Sea fiscal régime may act as a deterrent to future North Sea investment<sup>1</sup>. The Committee concluded:

"that the tax system, at its current level, complexity and frequency of change, has now passed the point at which its impact can be said to be 'broadly neutral' and that a substantial risk exists that development is being discouraged"<sup>2</sup>.

We maintain that the changes since 1982 have not altered the fundamental deficiencies of the North Sea tax system. Large-scale changes in the oil taxation system were introduced by the Chancellor of the Exchequer in the March 1983 Budget. These changes were met with "surprise and jubilation among the oil companies"<sup>3</sup>. We consider if the general contentment of government and industry with the tax system is appropriate. Moreover, we consider whether the view expressed by the Secretary of State for Energy and the Chancellor of the Exchequer that,

"The Government has devoted considerable effort and resources over the past few years to analysing a wide range of alternative tax systems ..... it does not believe that these alternatives would meet the various objectives involved more satisfactorily than the structure it now [in March 1982] proposes"<sup>4</sup>

is justified and we go on to advocate an alternative system.

In December 1981 a system of oil taxation was proposed by the Institute for Fiscal Studies<sup>5</sup> (IFS). The IFS recommendation was for a resource rent tax to be imposed on the offshore extraction industry. Because only pure profit would be taxed, the resource allocation decision would not be affected by the IFS tax, that is, it would have a broadly neutral impact. This paper examines the case for a resource rent tax in the UK North Sea.

In the next section, we highlight five important shortcomings of the existing tax system. These are that the tax system lacks progressivity, it fails to protect the normal returns on capital, it is unable to deal adequately with the special characteristics of risk in the offshore oil sector, it distorts incentives and it is inherently unstable.

Section 3 provides a history of the resource rent tax. It outlines how the IFS proposals would function and considers how it is an improvement over the existing system. The paper concludes that the existing tax system is intrinsically unsound and that the changes made to the system have not addressed the source of the tax problems, rather, they have tinkered with the symptoms of the deficiencies in a largely ad hoc manner. Moreover, the introduction of a resource rent tax, such as the IFS proposals, would result in net gains to the economy by stimulating more North Sea investment still meeting government targets for the size and timing of tax revenues.

#### 2.1 ABSENCE OF PROGRESSIVITY

Progressivity in a tax system implies that as profits increase the tax take, as a proportion of pure profits, increases at a more than proportionate rate. Pure profits may be defined as those profits in excess of the level necessary to induce economic activity - in the oil industry allowance must be made for some return on capital and risk. In practise, when pure profits are low, a progressive tax system will collect negligible sums but when pure profits are substantial, a significant proportion will be collected in tax. Progressivity should be an automatic feature of the tax system so that the tax take should increase progressively without changes being made; especially structural changes, for instance, to the allowances.

#### Relevance to Development Decisions

When compared to a non-progressive system, a progressive tax system has three beneficial implications for development decisions. First, for a given tax revenue target a progressive system will be less likely to impair project economics to such an extent that development decisions are jeopardised. At the point where companies are just earning marginal profits, the impact of a progressive system will be negligible.

Second, if the tax is progressive then the detrimental impact of other imperfections in the tax system will not be magnified. For example, if the

tax base includes part of normal profits then there will be a reduction in marginal field profitability. If the tax system is not progressive then this reduction may be severe and development decisions on many fields may be jeopardised.

Furthermore, if the tax system is progressive, then it is more likely to be stable. Under a progressive system price rises would automatically cause tax revenues to increase and there would be no need to change the system's rates or allowances to bring further additional revenues.

The third beneficial implication of a progressive tax system is that price signals to the developers of marginal fields will not be dampened. When prices fall or inflation rises, in a progressive system the impact on post-tax profits will not be cushioned for fields which are less attractive. Hence, when a field is just earning enough profits to warrant development, taxes will not be relevant to incremental economics and will not interfere with development decisions.

Apart from these three beneficial implications for development decisions, a progressive tax system would also adhere to the equity principle that 'the rich should pay more'.

#### Evidence

Progressivity may be implemented either by having a tax base that is proportional to profits with a rising schedule of tax rates, or by having a single tax rate with a tax base that grows progressively with profits. Of course, these two methods may be combined.

In the UK, the government opted for a tax system without rising schedules of tax rates. To discover whether the tax system is progressive or not, it is therefore necessary to investigate if the tax base rises progressively.

#### PRT

Within the PRT tax base, the progressive element is supposedly provided by the oil allowance, which exempts from PRT a certain volume of oil per year up to a cumulative total per field. Although the size of the oil allowance has been altered, twice, its aim remains to provide a progressive incidence in the tax system and to aid less profitable discoveries.

Being calculated purely in terms of a fixed quantity of oil, the oil allowance is of greater benefit to small fields than to large fields. If small fields are consistently less profitable than large fields then the oil allowance would be progressive. It is a fallacy, however, that big fields are necessarily more profitable per unit than small ones. In practise, the advantage of the oil allowance is enjoyed more by profitable than by less profitable fields. We found that the range of the tax takes across all fields in production or under development is widened by incorporating the oil allowance. However, the fields of lowest profitability are not the ones to receive the greatest benefits and the impact of the allowance on fields of similar profitability varies widely.

#### Corporation Tax (CT)

CT was not designed to be progressive and is, in practise, regressive. First, although pure profits are reduced by risk premia and normal returns to capital, the CT base is unaffected by these changes - an effect accentuated because PRT is non-progressive and PRT is a CT allowance. Second, in assessing the ability of CT to become less onerous when oil prices decline and risk premia become relatively more important, we have found that without exception, CT collects proportionately more from each field when prices are lower (and the risk premia is more important).

#### Lessons

Not only does the tax regime fail to collect the economic rent in a progressive manner by isolating the most prosperous fields from the less prosperous projects, but it fails to be progressive for individual field projects.

PRT is regressive because the PRT base does not grow progressively with profits. For a tax system to be progressively related to profitability in the absence of a rising schedule of tax rates, it must have a tax base that is lower than net revenues to reflect both a normal return to capital and risk premia. Both these factors are particularly difficult to quantify and measure. It is doubtful if any concession or combination of concessions could be designed to distinguish between the less profitable and the more profitable projects given the wide variety and complexity of economic circumstances surrounding North Sea oilfields. Hence, we are sceptical that a tax base could ever be designed that would rise progressively with profits.

Instead, the principal lesson of this section is that progressivity should be implemented via a rising schedule of tax rates, with a tax base that is proportional to profits.

## 2.2 THE RETURN ON CAPITAL

If a tax system is to be based on pure profits, (aside from the considerations for risk - see below) then its cost allowances must reflect not only the scale of expenditure but also the timing of expenditure relative to revenues. In tax systems that do not have full allowance for lead times and heavy front-end loading of capital expenditure, the normal return on capital will be depressed.

### The PRT Uplift Provision

In the absence of any special provision for the normal return to capital, capital would be diverted away from the North Sea into less productive spheres. While this misallocation of resources is likely to be greater in absolute terms for capital intensive projects, it will be most essential for the projects with the longest lead times where the importance for the tax to be assessed on real discounted profits rather than nominal undiscounted profits is greatest.

The uplift provision in PRT is the feature in the North Sea tax system most likely to alleviate this distortion. It creates an additional tax relief for development costs (relative to tax relief on operating costs) which tends to reduce any intra-industry distortion. However, examining the uplift's impact shows the inter-industry disincentive is not rectified.

In general as project lead times shorten, the advantage of the uplift increases. Indeed, we have found that most of the projects with the longest lead times, which therefore are likely to need greater protection for the normal return on capital, receive little benefit from the uplift provision. Conversely, oilfields that are less likely to be seriously affected because lead times are shorter, find the uplift valuable.

### Corporation Tax

Only if the CT base is identical to pure profits will the tax be non-distortionary. CT, however, is a tax on the excess of revenues over

historic costs and may affect development decisions since historic costs do not include any normal return on capital. Indeed, only under rather rare circumstances will CT be a neutral tax. Moreover, since the demand for North Sea oil from any one producer is close to being perfectly elastic, the burden of the tax cannot be passed on. At the margin, pre-tax discounted profits must be positive, and pre-tax rates of profit must lie above interest rates for post-tax discounted profits not to be negative. Consequently, investment opportunities will be depressed, investment will be held back, capital equipment will be under-utilized and fewer North Sea oilfields will be developed than might be developed in the absence of CT.

### Lessons

Because capital costs in the tax system are assessed in historic terms, the tax incidence tends to fall not only on pure profits but partly on the normal return to capital. Even the PRT uplift is just an arbitrary multiple again based on historic costs. For the tax system to leave the normal return to capital unaffected, an allowance reflecting the normal return to capital must be incorporated in the tax system. There are two components to this allowance - first, the real rate of interest that is available in alternative investment opportunities, and second, an item to reflect inflation between the date of expenditure and the date of allowance against tax.

We have demonstrated that the uplift allowance in PRT is too rigid to reflect these two components. Even if it could CT would still have a detrimental impact, particularly as a consequence of the limited first year allowances for capital expenditure. Thus an allowance for capital costs is needed which not only reflects the level of spending but directly and automatically increases as lead times lengthen, as inflation rates alter, and as interest rates change.

### 2.3 RISK

Exploration activity is dominated by risks; risks of drilling dry holes, risks of delineating a poorly defined deposit and risks in evaluating the commercial prospects of a discovery. Generally, in the exploration stage, the risks are related to the unknown about the geophysical attributes of a tract, whilst financial risks become more pronounced once development is underway.



### Relevance to Development Decisions

Financial risks reduce the incentives to delay production and makes capacity installation less attractive. In the absence of a complete set of forward and state contingent markets, oil producers must base their decisions on expectations of future demand. As demand in a future period will only be reached through a sequence of spot markets a risk of mis-estimating demand must be borne by companies developing oilfields that cannot be insured against by hedging in state contingent markets. Even assuming expectations are rational and the central estimate is unbiased, the wider the range then the more production will be shifted out of a period associated with greater risks and either into other periods or never produced. As more distant periods are associated with greater uncertainty, the effect of risks tends to be to generate a more rapid rate of depletion, from a smaller recoverable reserve base.

### Risk Profit and the Capacity Decision

In the margin, expected profits from installing North Sea capacity must be positive to attract investors to bear risks. Thus the tax base must be pure profits less an amount just sufficient to compensate for risk. Although such a tax system would probably not be distortionary, this is not guaranteed. The lack of any distortion rests on leaving the marginal profits unaffected and assumes the marginal risk premium will not be altered as the level of total profits fluctuates. However, risk premia are likely to vary with a company's total profits - hence, taxing intramarginal profits will tend to affect the size of the marginal risk premium required by the company. For a tax system to have no impact on the capacity choice it would have to be specifically designed to suit each company's view of its relationship between risk and expected returns. Although it is possible to envisage a tax system that might be capable of this for one or two companies, it is not possible to conceive of a system capable of such neutrality for the wide range of North Sea projects and companies.

Not only are the risks greater in the offshore industry than elsewhere, but as insurance possibilities are strictly limited they are economically more significant. On the one hand the risks in major variables such as oil prices or cost inflation tend to affect all projects in the same direction - so several prospects cannot be pooled - and on the other hand the scale of risks is so massive that even after they are spread amongst many shareholders each

shareholder will be aware of the uncertainty in his yield and capital gain. It follows that oil companies are likely to be risk-averse and must be persuaded to bear risks via receipt of pure profits. Thus there is a positive role for pure profits in the allocatory mechanism. Financial risk-bearing implies that risk-averse companies must be rewarded for holding risks by the receipt of profit. The current tax system cannot distinguish between risk profits and pure profits, and will tax both. As risk profits effect decision-making, the tax system will not be neutral - both depletion and capacity decisions are likely to be affected.

#### The Effect of Taxing Risk Profits and Compensating Losses

Taxation changes the risks, not only by reducing possible gains but also, because losses are allowable against tax payments elsewhere, by returning possible losses. A tax system will scale down the variance in marginal benefits from capacity installation. For the capacity choice to be unaffected by taxation, the reduced variance in marginal benefits must be equal to the required risk premium. If however, the necessary risk premium is not reduced by the same proportion as the variance in the marginal benefits, then the tax system will not be neutral in its effect on capacity decisions. If the required risk premium falls by proportionately more (less) than the fall in variance of marginal benefits, then capacity will appear more (less) attractive and more (less) North Sea activity will be likely. The outcome will be related to individual companies' circumstances and their views of risk. It seems most likely, however, that because lower income companies will require more compensation for exposure to an additional unit of risk, the tax system will be a disincentive to investment.

#### The Effect of Taxing Revenues but not Compensating Costs

The scale of offshore finances and the volatility of the economic climate around North Sea profits both tend to make a company's North Sea assets dominate its portfolio. This implies that the tax profits on non-North Sea operations are relatively small and that intramarginal units may not be unexposed to making a loss. Hence, the tax system may operate as a tax on profits with no offsetting tax subsidy available on losses, and companies will be deterred from installing capacity.

Evidence

Companies investing on the scale necessary to develop an offshore oilfield must be wary of events that could undermine their expected returns. Initial appraisals of field economics must incorporate a level of expected profits to compensate the firm bearing risks. These risk profits will be most crucial on the less profitable developments: the more promising reserves are likely to be worthwhile even under pessimistic forecasts of oil prices and costs. We are therefore crucially concerned that PRT does not impose an additional burden on the marginally commercial projects.

The tapering and safeguard restriction on PRT is designed to put a limit to the tax burden and a floor to possible profitability. In general the tapering clause is or has been helpful to some but not all of the less profitable fields; however, it also has been an advantage to several projects not needing protection and cannot guarantee to protect all of the least attractive fields. Moreover, of the yet to be developed fields examined, very few are affected by the tapering and safeguard provision. The restricted time period for use of this provision means it only operates when other allowances, particularly the oil allowances, are already shielding revenues from tax.

Tapering alters the impact of a decline in oil prices on project returns. We have assessed the decreases to project profitability caused by a decline in oil prices, first with all the PRT allowances and then with the tapering and safeguard clause removed. More often than not, the tapering clause makes no difference or a very small difference to the impact of depressed prices, despite the hopes for this provision. However, if events do change for the worse, the decrease in expected profitability for some of the less profitable projects is not guaranteed to be lessened by tapering, and this clause actually exaggerates the impact for some fields.

Tapering does little to stop PRT deterring the exploitation of marginal reserves. Tapering at best only partially protects a project's risk profits and PRT is likely to discourage companies from investing in the North Sea, although they might have been willing to invest and bear the risks in the absence of PRT.

## Lessons

Different tax systems will offer different incentives for bearing incremental units of risk. In the current North Sea system taxation is unable to distinguish between risk profits and pure profits. As a result, not only are the expected returns and the financial risks both reduced but the trade-off between expected profits and risks becomes more unfavourable. Hence companies are discouraged from bearing risks and North Sea developments are deterred. For the trade-offs between expected profits and risks not to become more unfavourable, taxes as a proportion of profits must decline as capacity increases and as marginally less attractive barrels are added to each field's recoverable reserves. It is because such progressiveness is lacking from the North Sea tax system that the topic of risk profits becomes important to development decisions.

One lesson that has emerged from this section is that the tax system should participate symmetrically in risk profits and risk losses as they affect the company. That is, first the risk profits/losses should be defined to reflect the company's opportunity cost of capital and second, they should reflect a company's risk aversity by recognizing the more significant consequences of making losses against the relatively smaller gain from an additional unit of profits. For this to occur, the oil taxation system should leave marginal profits untaxed and be progressive with respect to individual field profits. Furthermore, taxes as a percentage of profits should be sensitive to prices as otherwise the impact of taxing risk profits will be aggravated.

### 2.4 TAXING INCENTIVES

In the offshore oil sector concern that the oil companies will receive windfall profits has been expressed whenever oil prices increased. In order to capture at least a part of this apparent windfall, the government has increased the level of taxation. The economic rationale for taxing windfall gains is that the windfall, by definition, does not lead to any change in economic activity. In a North Sea context, though, the windfall nature of additional profits is questionable as companies will plan under a variety of oil price trends, some involving large price increases. Hence, sharp increases in oil prices are unlikely to be totally unforeseen and the possibility of an oil price rise (or fall) will be relevant to companies'

development decisions. Any attempt by government to tax those profits will tend to act as a tax on incentives and thereby to deter development plans.

Successive UK governments have acted as though they were unaware of the reasons why oil prices rise or the role of oil company profits as history shows a strong connection between increases in the oil price and increases in taxation. Oil prices, however, rise for the fundamental economic reason that there is a shortage of oil worldwide, and will continue to rise so long as oil demand exceeds supply. The rising price then acts as a signal both to reduce demand and to increase supply. By interfering with the incentive to increase supply, the government may jeopardise this desirable supply response.

The difference between progressivity and increasing taxation as prices change should be made clear. Progressivity refers to the tax take increasing as pure profits increase (at a more than proportionate rate) which leaves marginal incentives unchanged. Increasing taxation in response to an oil price increase, however, represents structural changes in the tax system that imply a new set of marginal incentives.

#### Relevance to Development Decisions

Rising prices indicate the need for more investment, which higher profits will provide the resources, and higher expected profits will provide the incentives, for more investment. We do not assert that market incentives yield in any sense an optimal allocation of resources in the UK offshore oil sector, but at least they reallocate scarce resources in the correct direction and tend to alleviate imbalances between demand and supply when pertinent economic factors change. This desirable reallocation presumes market incentives are allowed to direct resources.

The UK government however, appears to view oil company profit increases as 'windfall' gains without recognising the long-run changes that such profits induce. Companies planning to invest large scale funds are wary of factors that might undermine their revenues in years ahead. Once the government believes its responsibility is to tax away all or a part of the profit increases, the desirable link between higher prices and increased supplies is broken. With fewer resources and reduced incentives, the oil companies will be less eager to develop new North Sea oil fields.

## Evidence

### Tax Changes as Government's Response to Oil Price Changes

Amending North Sea taxation is by now the familiar British government response to rising oil prices. Support for these tax changes comes from all political parties and receives favourable comments from the Press. This section establishes that government policy is to raise North Sea tax rates or lower allowances as oil prices rise. Seven periods of taxation can be identified - the original system plus six groups of changes - which have been set out in Chart 1. We now trace the history of North Sea taxation from its origins in 1975 to demonstrate the link between oil price changes and tax changes, and in particular to demonstrate that this link is a deliberate intention of policy.

When the then Paymaster General, Mr Edmund Dell, finalised Petroleum Revenue Tax (PRT) in 1975, he was confident of the impact of the tax:

"By this tax we are trying to achieve a great and irreversible switch of profits from the oil companies to the British Government. However ..... we have to accept that the oil companies must make a reasonable return on their investment. That is all we have done. We have established a reasonable sharing between the British people and the companies"<sup>6</sup>.

The Paymaster General, made clear the action that would be taken if oil prices rose faster than the commonly held expectations for depressed oil prices (outlined below).

"I am, of course, fully seized of the fact that a change in the price of oil relative to price levels generally could have a profound effect on profitability. I therefore made it clear on Second Reading, and I take this opportunity to reaffirm that the Government will stand ready to review and adjust the incidence of PRT in the event of a sustained and significant change in the price of oil in real terms"<sup>7</sup>.

Although the passage of PRT through Parliament generated much debate the lack of debate on the necessity to amend PRT in the light of movements in the real price of oil reflected a consensus of view. By 1978, then Chief Secretary to the Treasury, Mr Joel Barnett, considered the oil price to have moved significantly from its 1975 level:

"We have come to the conclusion that there is scope for increasing the share of North Sea profits which accrue to the public. Now, however,

CHART 1: THE EVOLUTION OF THE NORTH SEA TAX SYSTEM

<u>Date of Proposal</u>	<u>Date of Implementation</u>	<u>Description of Change</u>
March 1975	January 1975	PRT introduced at a 45% rate with 175% uplift, annual oil allowance of 1m tonnes, field oil allowance of 10m tonnes and tapering provision
August 1978	January 1979 July 1978 January 1979	PRT rate increased to 60%. Uplift decreased to 135%. Oil allowance in PRT halved. Payment of royalties accelerated.
March 1980	January 1980 January 1981	PRT rate increased to 70%. Advanced payments of PRT introduced.
March 1981	January 1981 January 1982	Special Petroleum Duty (SPD) introduced. Uplift limited to period up to PRT payback. Tapering and safeguard limited to a period half as long as the period to PRT payback, once PRT payback is reached.
March 1982	January 1983 July 1983	SPD abolished, Advance Petroleum Revenue Tax (APRT) introduced, PRT rate increased to 75%. Advanced payments of PRT replaced by a system of spreading PRT payments.
June 1982	January 1983	APRT applies for 5 years only with any outstanding APRT settled at the end of the 5th year.

CHART 1: THE EVOLUTION OF THE NORTH SEA TAX SYSTEM (Continued)

<u>Date of Proposal</u>	<u>Date of Implementation</u>	<u>Description of Change</u>
March 1983	July 1983	APRT rate reduced to 15%.
	January 1985	APRT rate reduced to 10%.
	January 1986	APRT rate reduced to 5%.
	January 1987	APRT abolished.
		All exploration and appraisal expenditure can be deducted from PRT profits on any field. For fields granted development approval after April 1982, excluding Southern Basin fields: (i) PRT oil allowance doubled to 10m tonnes per field and 1m tonnes per year per field; (ii) Royalty payments abolished.
March 1984	April 1983	CT rate reduced to 50%.
	April 1984	CT rate reduced to 45%.
	April 1985	CT rate reduced to 40%.
	April 1986	CT rate reduced to 35%.
	April 1984	CT first year capital allowance reduced to 75%.
	April 1985	CT first year capital allowance reduced to 50%.
	April 1986	CT first year capital allowance reduced to 25%.



though many uncertainties remain we are in a position to take stock and it is apparent that companies are obtaining very large profits from the national resources of the nation. We believe that the public share of these profits can and should be increased without endangering the exploitation of the less well-placed fields"<sup>8</sup>.

The same conclusion was drawn by the then Conservative opposition spokesman on energy, Mr Tom King.

"We accept that there is clear scope for adjustment of the tax regime"<sup>9</sup>.

Early in 1980 the situation had changed further. The Chancellor, Sir Geoffrey Howe, was not oblivious to the changes in the oil industry.

"Since my last Budget, world oil prices have increased dramatically. North Sea oil prices, which follow world prices, have risen by more than half, from about \$20.70 to \$33.75 a barrel. This substantial change has greatly favoured the oil companies. I therefore propose ... to increase the rate of petroleum revenue tax. The increases in oil prices have greatly strengthened the industry's cash position"<sup>10</sup>.

The Chancellor went on to introduce a higher rate of PRT, which received no opposition from the Labour Party - Mr Callaghan replied:

"There is much to be said for increasing the petroleum revenue tax from 60% to 70%"<sup>11</sup>.

Later in the same year, however, further tax changes were announced by the Chancellor:

"Since March there has been time to assess more fully the implications of the steep rise in the price of oil since 1978. This has been on as large a scale as that in 1973-4. The government have concluded that there is scope for a further increase in oil taxation"<sup>12</sup>.

On behalf of the opposition party, Mr Denis Healey, the Shadow Chancellor, concurred with this view.

"The Opposition welcome the Chancellor's announcement that he will put a tax on the windfall profits of the oil companies"<sup>13</sup>.

At the start of 1982, though, current oil prices were depressed and the forecasts for rapid real oil price growth throughout the 1980's and 1990's

were revised downwards. The Chancellor reviewed these changes in his March 1982 Budget speech.

"The current fall in oil prices reduces the revenue that the Exchequer receives. I recognise that it reduces the revenues of oil companies as well - but it also reduces the tax they have to pay. Detailed study has convinced me that ... the total tax burden is not such as to discourage exploration or development. Nor is it so high as to deprive the oil industry of a reasonable, and often attractive, yield. In these circumstances, I cannot reduce the overall tax burden to the extent that the industry would have wished. But I do agree with it on the need for some change of structure"<sup>14</sup>.

Without any serious debate the Chancellor's measures were legislated. APRT replaced SPD and the rate of PRT was increased to make up the bulk of the shortfall in tax revenues that might otherwise have occurred.

The history of North Sea taxation has seen numerous substantive changes since PRT was first formalised. Continuing his Budget speech, Sir Geoffrey referenced these changes:

"I am aware of the concern felt by the industry about the number of changes in the regime there have been in recent years. For this reason, my hope is that the new tax structure that I have proposed will provide a more secure and stable regime for the future, permitting development to go ahead uninhibited by major fiscal uncertainties"<sup>15</sup>.

A hope that was dented some three months later when, in June 1982, adjustments to the new system of taxation (which had then not even been in operation) were announced.

"I believe there are adequate returns on North Sea projects at the current broad levels of taxation. I do, however, accept that the operation of my proposals, particularly as they affect some more marginal fields, could be improved by modification"<sup>16</sup>.

In his press statement issued to explain the modifications, the Chancellor confirmed the connection between tax changes and oil prices.

"It has been an opportunity to take further stock of the position in the light of the latest prospects for oil prices"<sup>17</sup>.

The 1983 Budget in March occurred in the wake of OPEC's London meeting. Amidst predictions of a dramatic oil price fall OPEC finally agreed upon a \$5 decrease in the OPEC reference price from \$34 per barrel to \$29 per barrel. In his budget statement the Chancellor explained the large-scale tax changes:

"Tax is not the only factor sustaining North Sea potential. Steps taken by the industry to cut costs and the future level of oil prices will be at least as important. But the tax structure must adapt as well. I am therefore proposing a substantially more favourable regime to assist the companies as they move on to develop new fields"<sup>18</sup>.

Mr Lawson, in his first Budget as Chancellor of the Exchequer announced in March 1984 that oil tax changes were being considered. Again, oil prices had been falling in real terms and the expectation of more price reductions remained.

"The Government are already committed to a study of the economics of investment in incremental development in existing fields. This is of increasing importance ... I therefore propose to review this area with the industry, and to legislate as appropriate next year to improve the position"<sup>19</sup>.

#### Taxing Incentives in the North Sea Oil Industry

Although the government has consistently stated a desire to collect a 'fair' share of North Sea profits, its notion of 'fair' seems to change to suit changing political interests. The precedent is clear and now companies probably expect further tax changes if oil prices continue to rise. Once the private sector begins to expect further government interference, one of two possibilities is likely.

##### (i) Outcome if Oil Prices Rise

Even if oil prices rise continually oil investment may be deterred by governments who change the tax system in response to higher oil prices. One desirable consequence of rising oil prices is that an impetus will be given to oil investment and fields which had previously been non-commercial will be developed. This, however, is based on two pre-requisites - that the capital funds exist and that the incentives are sufficiently improved. In the North Sea, however, it may be that the first of these pre-requisites is broken since even if oil prices do rise there will be negligible additional funds for

investment in new fields as the level of taxation is likely to be increased in line with oil prices.

It would be expected that as a result of an oil price increase the North Sea industry would be, *ceteris paribus*, more profitable and there would be ample finance available to expand and develop new oilfields. Above we demonstrate that an increase in taxation tends to be associated with a price increase. Incorporating tax changes associated with higher oil prices into calculation of aggregate net cash flows, it is apparent that the effect of the tax changes is to moderate substantially the increase to industry cash flows resulting from increased oil prices.

Whereas the preference for higher oil prices is a preference that one would expect the North Sea industry to demonstrate, this preference may no longer hold if oil price changes necessarily induce tax changes. Indeed, one consequence of taxing incentives is that the industry might actually prefer lower oil prices (and less harsh taxation) to higher oil prices (with harsh taxation). However, what is definite is that oil price increases tend to bring forth tax changes that nullify the advantages of higher oil prices and the increased attractiveness of North Sea investment will be attenuated, the expansion of the North Sea industry will be moderated and companies' keenness to develop new fields will be lessened.

Field-by-field analysis for a range of possible new discoveries emphasises the possibility that the second pre-requisite for the desirable supply response - sufficient incentives for new project developments - may also be broken by a policy of increasing the level of taxation in response to higher oil prices. So long as there are no tax changes, higher oil price expectations will lead to a rise in the real net present values per tonne on new oilfields. After considering tax changes actually implemented, however, the benefit of higher oil prices on unit profits of new discoveries is severely diminished.

(ii) Outcome if Oil Prices Fail to Rise

The government's policy of raising taxes in response to higher oil prices is likely to have an undesirable consequence even if oil prices do not rise.

Once history has established that governments will increase the tax take whenever oil prices rise then there will be an impact in the future even if prices do not continue to rise and there are no further tax changes. Before an oil company undertakes an exploration or development project in the North Sea it goes through a complicated process, evaluating the factors that may affect the profitability of its investment. The company might use its contemporary forecasts of inflation, exchange rates and real costs under a variety of oil price scenarios in order to quantify the expected profitability and riskiness of any discovery. Incorporating the link between tax policy and oil prices might alter this evaluation process dramatically.

The chance that oil prices may be lower than some central estimate, and that losses for the companies involved in these discoveries might arise, is unlikely to be significantly affected by a less severe tax regime. However, the chance of earning substantial profits, with higher than forecast oil prices, is affected markedly with possible unit profits and rates of return unlikely to rise substantially due to tax changes. The commercial attractiveness of all new projects is likely to decline, and the likelihood of each project being pursued is lessened.

#### Lessons

A government policy of continually meddling with oil taxation adds a disincentive to long term company planning that will reduce North Sea investment and consequently North Sea oil supplies. Government is either unaware of the long-term damage caused by interfering with the profit incentive or is so dominated by short term considerations that it has little concern for adverse effects in the more distant future.

A fundamental lesson of this analysis is that the government must appreciate the importance of oil company profits in times of oil price changes. The volatile nature of oil prices makes it unlikely that price increases are entirely unforeseen and entirely unanticipated, and thus profits must be allowed to rise if the positive impact on development decisions is to occur. Governments must understand that it is not possible to alter the distribution of profits by interfering in the profit mechanism without distorting the decision-making process.

It is crucial for government interference to be minimized. This objective would be helped if the tax system automatically increased the tax take in response to higher oil prices (that is, as fields' profits increase). This will lessen the need for tax changes to be introduced on the basis of short term consideration of the Public Sector Borrowing Requirement.

If, and only if, the political pressure is such that adjustments to the tax system still have to be made in response to oil price increases then the structure of taxation should not be altered. Providing the tax system protects the normal returns to capital and risk premia, then limiting tax changes to tax rates, although undesirable, will have less detrimental consequences than altering the tax structure since this will not compound other faults in the tax system. If this proviso is not satisfied then even this second best alternative should be avoided.

## 2.5 INSTABILITY

Tax instability in the offshore oil sector refers to unpredictable government imposed tax changes. No other sector in the UK economy has been subject to such instability. In the UK oil sector however, there is uncertainty both as to when tax changes will occur and as to what tax changes will occur. Tax instability is an additional source of risk in the offshore industry which imposes additional costs on oil companies.

We first establish why tax instability is important in the oil extraction industry and then outline how instability affects North Sea oil economics.

### Relevance to Development Decisions

Our interest in this section is with tax changes per se. Although we have argued in previous sections that UK oil profits taxation does not match the peculiarities of the North Sea extraction industry, so that taxation needs to be restructured, the tax changes that have been implemented were not designed specifically to improve the structure but were merely a response to changed government needs.

It is important to make clear the distinction between taxing incentives and instability. We have attempted to establish the connections between tax changes and oil prices, whereby increases in tax rates or reductions in allowances tend to occur as oil prices increase. This link should be seen as

a predictable government response following from the (misplaced) intention to tax increased profits following oil price increases. However, while history shows us that oil price changes have preceeded tax changes, so that a significant change in crude oil prices seems to be a sufficient condition for tax changes, a crude oil price change is not a necessary condition and is not the only event that will generate oil tax changes. Indeed, whenever the capacity of the UK oil industry to bear taxes alters in the eyes of the electorate, the government is likely to respond to such changed perceptions by adjusting oil taxation, especially in the months close to an election, in its attempt to maximize votes.

Instability then refers to ad hoc changes in the level or structure of taxation which are not easily predicted. The unpredictable nature of these tax changes creates a further level of uncertainty which increases the riskiness of North Sea investment.

### Evidence

#### Political and Bureaucratic Pressures

In order to maintain political power, governments like to be seen to be in control of the oil sector. In their desire to maximize votes, governments will attempt to adopt policies that are popular with the electorate on all important issues. For a sector as important and with as high a profile as North Sea oil, this results in governments forming policies which are perceived to control foreign based multi-national oil companies, to protect a 'valuable national asset' or to guarantee secure oil supplies for the domestic economy. Generally, this pressure is most intense at election times or when the oil sector is at the forefront of the public's attention - for instance, an international oil supply crisis receives considerable media attention and politicians introduce or modify policies in an attempt to be seen to be in control.

In addition, government bureaucrats often favour a changing, complex policy in order to reinforce their status and prestige. The more complex a policy and the more times it is changed then the more their expertise becomes exclusive and the more their expertise comes into demand. Hence, by advocating and promoting change to an already complicated tax structure, the bureaucrat's job security and status are protected. As a result of political and bureaucratic pressures on government, seemingly random tax changes occur which are not, at least by oil companies, predictable<sup>20</sup>.

## Instability and Taxing Incentives

### (i) Changed Expectations

While it is important not to describe government intentions to tax incentives as increasing instability, (because the intentions are predictable) the increases in tax rates or reductions in allowances following oil price changes have an element of instability in them. The government's intention is to increase taxation in line with oil industry profits, which it views as synonymous with oil prices. In principle this link may have detrimental consequences. In practise this link may also create instability for two reasons. First, oil prices are not the only major factor contributing to oil industry profits. Instead oil price moves should be analysed alongside the paths of exchange rates and inflation. As this has not been the case, additional uncertainty over when tax changes will occur has been created. Second, the cumbersome North Sea tax structure has meant that any tax changes have had vastly different impacts across the range of fields. This creates additional uncertainty for any company which will not know if their fields are to bear the brunt of higher taxation or if their fields will be minimally affected - that is, additional uncertainty is created about the type of tax changes.

### (ii) Changed Aggregate Profitability

In the previous section on Taxing Incentives we suggested that taxing profits increases would be damaging in principle. However, because tax changes have been made in response to nominal dollar oil prices rather than sterling oil profits, the government's attempts to tax profit increases have tended to fail and instead have increased taxes even when the improvement to incentives was questionable. The government does not seem to have fully appreciated the range of economic factors affecting the industry or has chosen to subjugate them to more immediate political considerations.

In either case, the government acts as if it has a myopic view of the factors affecting oil profits and investment. Whereas the oil industry's fortunes are more related to the change in real profits between different times, the government acts on different criteria, focusing on the change in the nominal dollar oil price alone. This creates two differences in perceptions between the industry and the government. First, the unit of measurement adopted by the government may be nominal rather than real sterling. This emphasises not only the government's relatively short time horizon but also its appreciation



of public perceptions which are largely based on nominal prices. Second, the government tends to analyse the effect of oil price changes while ignoring the effect of any changes in other economic conditions.

However, by ignoring changed exchange rate and inflation expectations the government perceives the impact of tax changes as not too burdensome, especially given the improvement to oil revenues following favourable movements in oil prices. The industry, on the other hand, is not only concerned with oil price changes but also with changes to other key economic variables, such as the sterling dollar exchange rate and the rate of inflation. Hence, tax changes have often appeared onerous to the oil industry. Indeed, the most startling example of this was in March 1981 when the tax changes took more from the industry than the industry had gained from the changed economic background and outlook.

#### Changed Field-By-Field Tax Burden

A further way in which tax instability may affect development decisions is through the field-by-field burdens imposed on the industry by changes to the tax system. Apparently, the government, tempted by the enhanced returns forecast for the more rewarding oilfields, considers it justifiable to alter the tax parameters because the tax allowances are believed to offer sufficient protection for the less rewarding discoveries. However, the allowances do not protect the returns on fields most needing protection, and the North Sea tax system burdens the less profitable finds while giving relatively favourable tax treatment to the more prosperous oilfields. Whenever tax changes are invoked there is uncertainty over what tax changes will occur and therefore additional uncertainty as to which fields will be affected.

Furthermore, we have found that as the tax level creeps upwards over time the field-by-field distribution of the tax burden has tended to worsen and the field-by-field impact of the various changes to tax rates and concessions has tended to be increasingly indiscriminate and arbitrary. Fields that have benefitted little in recent times and can least afford to pay more tax are penalised just as heavily as the more prosperous fields which have benefitted greatly.

Such an ad hoc approach has to date back to a two tier structure of North Sea taxation with a relatively lenient tax system for new fields, to encourage

their development, while older fields are subject to a much higher average tax rate, in order that government revenues are maintained. Our reasoning, however, suggests that when these new fields commence production the government may tighten the fiscal regime<sup>21</sup>.

### Lessons

We have outlined the dangers of attempting to tax profit increases that follow oil price increases as, in principle, this may negate the incentives to install additional capacity. This section has suggested there are additional dangers of altering North Sea taxation in practice. First, because oil prices are not the only factors that play on oil company profits and second, because the cumbersome North Sea tax structure means tax increases tend to fall on the fields that can least afford to shoulder additional tax burdens.

Tax stability would be more desirable. Apart from the additional uncertainty created by governments who seem unaware of the dangers of altering North Sea taxation whenever it is politically expedient - which in itself would be sufficient to deter development decisions - arbitrarily altering allowances and concessions within the oil tax package has a detrimental impact on oilfield economics - progressivity is impaired, the return on capital is depressed and risk profits are penalised.

If, and only if, the tax structure can discriminate between rich and poor fields should the government consider raising extra North Sea revenues from the existing tax system. As the burden of taxation is badly misplaced, and as the changed tax rules serve only to accentuate the unfair tax distribution, tax changes seem ill-advised. An indiscriminate additional tax burden is not only unfair but also dangerous to the economy. For if the profits from the more complex, more risky and more costly fields are taxed away, companies will have no incentive to develop these reserves, North Sea investment will be lower than it would otherwise be, and potential North Sea output will have to be replaced by relatively expensive imports.

If however, the political pressures on the government, stemming from the need to be seen to be in control of the oil sector, are so strong that oil taxes must frequently be altered, then a second best approach should be adopted. If this is the case, then to satisfy governments needs to be seen to be in control, changes to oil taxation should be restricted to changes to tax rates alone - rather than changes to tax allowances. This though cannot be achieved

within the present system because changing tax rates does not make a sufficiently material difference to the level of taxation. In any case, if the tax system is highly complex, changes in tax rates may still create uncertainty. Hence a simple system whose tax rates have a meaningful impact on the level of taxation would help tax stability by reducing the uncertainty over the type of changes that may occur. It would, of course, be better if no changes were to occur, thereby also eliminating uncertainty over when changes will be made.

The only remaining rationale for tax changes is if the oil tax system is to be reconstructed in the light of the problems encountered in, and the peculiarities of, offshore oil projects - an approach that should have been adopted in 1975. Greater emphasis would be placed on the plight of the barely commercial discoveries while the better projects would bear more of the burden of taxation. This reconstruction would need to be major, as piece-wise tinkering would be unlikely to provide any rectification of the problems outlined in this paper.

### 3.0 THE RESOURCE RENT TAX

Before we can finally condemn the present tax system we must introduce an alternative that has less of an impact on development decisions but which still satisfies government revenue requirements. As we have tried to emphasise, a tax system ought to extract the economic rent - and only the economic rent - from an industry because the producer's decision-making process would not then be affected by the tax. That is, in the oil sector, the pace of production, the technique of extraction and the choice between competing projects, would not be distorted by a government that captures economic rent via the tax system.

In principle, there are two ways in which the economic rent may be extracted<sup>22</sup>. First, some system of competitive cash auctioning of oil licences (including all rights of extraction) could be used to stimulate each company or consortium to bid their valuation of the expected economic rent. As a result, it would be reasonable to expect the lowest cost producer would win the licence<sup>23</sup> and providing sufficient competition existed amongst companies or consortia, the full value of the economic rent would accrue to the licensing authority and no further taxation would be necessary. There are two main drawbacks to this procedure. First, the auction must be truly

competitive, otherwise not all the rent will be extracted. Second, as it is an ex ante method of rent extraction, there is always the danger that at a later stage some further tax may be imposed in response to political pressures or changed economic expectations. This danger will itself depress the level of bids in an auction. In addition, auctioning may no longer be a practical option for the UK North Sea given the extent of acreage already licensed.

The second method of capturing the economic rent is by some form of ex post tax. Taxes, however, tend to distort the decision-making process, particularly when applied to long lead time extraction industries. In response to these problems, economists such as Brown<sup>24</sup> initially, and Garnaut and Clunies Ross subsequently<sup>25</sup>, developed what has become known as a Resource Rent Tax, which formed the basis of the 1981 IFS proposals.

### 3.1 AN ALTERNATIVE PROPOSAL

In short, the IFS Committee recommended that the contemporary tax regime of royalties and PRT be abolished and that Corporation tax no longer apply to North Sea oil operations.<sup>26</sup> In its place, Petroleum Profits Tax (PPT) would be levied. PPT was constructed as a field-by-field tax based on revenues minus all costs and with any losses not only carried forward but compounded at various rates of interest.

The rates of interest are related to real rates of return on investment. The three threshold rates of interest, below which no tax in each band is payable, would be set at 15%, 25% and 35%, with corresponding tax rates of 50%, 25% and 10%. This implies that until a 15% rate of return is reached no tax will be payable, between rates of return of 15% and 25% profits will be taxed at a rate of 50%; between rates of return of 25% and 35% and additional tax of 25% will be payable (giving a total rate of 50% + 25% = 75%) and for profits yielding a rate of return above 35% an additional tax of 10% is levied (giving a total of 85%).

We have explained the weaknesses of the current tax system and made suggestions for its improvement. On the one hand, we discovered that the provisions in PRT do not perform the functions they were intended to perform, and, on the other hand, we found that the relationship between PRT and Corporation Tax impedes the proper functioning of the tax system and the distribution of its burden. Improvements would then fall into one of two

categories - either simplifying PRT or simplifying the interconnections between PRT and other taxes. Since the IFS proposals represent both types of simplification, there are strong reasons for believing it will be an improvement.

The impact of implementing these proposals has been assessed, first on the government's position via a comparison of the aggregate tax revenues likely under the different tax systems and then on the industry via an examination of inter-field profitability.

#### Impact on Government

The government appear to have several criteria in its requirement for North Sea taxation. The criterion with the highest priority is probably the scale of early tax revenues. If early revenues fall short of the level expected under the existing tax system, the impact on the PSBR may be significant enough to force government to alter its macroeconomic strategy. Any tax system which failed to produce a tax yield similar to the current tax system would be unacceptable.

Another criterion for government North Sea policy relates to more general principles of political strength. It is in the government's interests to be seen to be in charge of the oil sector particularly in times when there is considerable public awareness of events in the oil industry. This suggests a system which increases the tax take when oil prices are high - such that tax revenues increase more than proportionately to pre-tax profits - would be favoured.

These criteria all relate to aggregate tax revenues. The Chancellor emphasised this concern at the start of 1981 when he called for suggestions to change the system of taxation<sup>27</sup>. He invited proposals that would not significantly affect total tax revenues and declared that all such proposals would be given serious consideration. Conversely, the field-by-field distribution of the tax burden does not seem to be an area receiving high government priority.

#### Aggregate Tax Revenues

The IFS Report maintains that total tax revenues from oilfields under the existing system and with PPT are remarkably similar and we are able to confirm

this. The IFS proposals satisfy the first government priority of a sufficient take. In addition with a low oil price forecast, the IFS proposals are likely to produce a little more in aggregate tax revenues than the existing tax system. The bulk of additional revenues would occur later, so that discounted tax revenues would not be much affected. With a relatively high oil price, PPT collects significantly more than the existing system. PPT would be likely to improve the sensitivity of the tax revenues to oil prices and because PPT acts progressively with respect to oil prices, stability in the system is promoted.

#### Inter-Field Burden of Taxation

In principle, PPT fulfills many of the desirable features raised in Section 2 of this paper: (i) PPT achieves progressivity not by arbitrary concessions or allowances but instead via a rising schedule of tax rates. The high tax rates will be levied where profits exceed prescribed rates of return - a better measure of field profitability than field size as suggested by the oil allowance in PRT. Thus with PPT, the average tax take is likely to be positively related to field-by-field profitability.

(ii) The tax allowance for capital spending automatically reflects both each field's exposure to front-end loading of costs and the interest burden implied by such front-end loading. Indeed, the IFS recommend that changes in either real interest rates or inflation that lead to a significant movement in nominal interest rates should be matched by altering the threshold rates, thereby keeping the normal returns to capital protected.

(iii) By constructing a tax base that conceptually matches pure profits, available risk premia in the margin will not be affected by taxation.

(iv) If government still wish to be seen to be in control of the international oil companies operating in the UK North Sea, PPT offers a simple and effective route for government intervention through the adjustment of tax rates. Although uncertainty over the timing of tax changes will not be eliminated, at least uncertainty over the type of tax changes may occur would not hold back development decisions.

Furthermore, since the PPT tax base resembles pure profits more closely than the tax base under the current tax system then tax instability will not aggravate other defects in the tax system.

(v) PPT is able to distinguish between the profitable and the less profitable fields, and to be sensitive to the factors which effect the attractiveness of North Sea investment on a field-by-field basis. Average government takes tend to be closely related to field profitability and fall or rise automatically with unfavourable or favourable oil market conditions (that is, lower or higher oil prices). Again, because the changes are automatic PPT would not tax incentives.

The inter-field tax burden under PPT seems to shift the burden of taxation away from the marginally commercial fields which are adversely affected under the existing system. It seems probable that, if the IFS proposals were adopted, North Sea investment would appear more attractive in the margin, more fields would be developed, the period of net oil exports would be lengthened and the balance of payments would be boosted.

#### 4. CONCLUSION

One theme developed is that the effect of the North Sea oil tax system on the offshore oil extraction industry appears to be misunderstood. Attention has tended to focus on the aggregate level of taxation and on the average level of the tax take over the lifetime of a typical North Sea field. As a consequence, the issue of taxation is seen as a matter of equity, where one side (the Treasury or the oil companies) can only be made better off at the expense of the other side. We contend, however, that by altering the structure of taxation both sides can be made better off. By alleviating the fiscal deterrents on new development projects, offshore recoverable reserves will be increased. The distribution of the increase in value may be a question of equity, but the failure to achieve the increase in value is a question of economic efficiency.

A dangerous level of complacency has now developed, especially since the 1983 Budget tax changes, evident in inconsistency between the industry's and government's perception of each other's requirements from the oil tax system. For instance, the industry believes taxation will not be made harsher and that the government would be willing to forego short term tax revenues. The government, on the other hand, does not believe damage may be done by increasing the burden of taxation on companies especially after capital expenditures have been sunk.

Marginal oilfield projects would benefit the economy as they offer rates of return higher than obtainable elsewhere by more than enough to compensate for higher risks. However, at the post-tax level these marginal fields are often not commercially attractive. This basic problem of the oil taxation system was not alleviated by the 1983 changes. The scale of the problems both to the offshore industry and to the domestic economy is such that the tacit acceptance of the tax system (especially by the government which has a role in protecting the economic interests of the UK), and the failure to adopt an alternative system is of considerable concern.

Clearly, the lack of government concern and its contention that no better alternative exists are connected. If negligible problems are created by the current tax system then improvements will be difficult. This paper attempts to emphasise that development decisions are being deterred and a better alternative does exist. It is worth noting Clunies Ross's approval of the IFS tax proposals:

"This system would be extremely simple, it would be responsive enough to profit to be very probably stable; it would, with some qualifications, approach neutrality in the most important respects; it would be unimpeachable on grounds of fairness; and the Committee show ..... that it would be expected to raise revenue comparable on average to that raised by the existing system on each field exploited"<sup>28</sup>.

Government revenues would become more sensitive to oil prices if the IFS proposals were adopted. Thus, some of the pressure to amend tax rules whenever oil prices change would be relieved. This seems particularly important given the inherently volatile nature of the world oil market. Changing economic and political circumstances cause pressure to be brought on the tax authorities to alter and amend the tax system. Recently, for instance, attention has focussed on the need to introduce tax concessions so as to encourage incremental investment and EOR in the UK North Sea. A tax system with a tax base of pure profits would not discriminate against capital expenditure incurred late in a field's life (that is, after Payback). With some sort of resource rent tax - PPT - the tendencies towards distortions and instability would not disappear but they would be much diminished as compared to the existing system. In times of low and falling oil prices the oil tax system - particularly because of its impact on marginal decisions - is extremely important. In attempting to maximize oil production on the UKCS the



government should seriously consider changes to the tax system. We feel that it is not too late for the changes, as discussed in this paper, to have a substantial impact on future oilfield developments maintaining the offshore activity into the twenty-first century.

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