

Tax incentives at work: The Norwegian Petroleum Tax Act and its impact on firm behaviour

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The high marginal tax rate of 78 per cent in the petroleum sector gives incentives for corporate profit tax avoidance. Together with the tax avoidance capacities of petroleum companies, this may affect real activity. The Norwegian State seeks to achieve neutrality in the investment and operational decisions of oil and gas companies. I investigate the neutrality features of petroleum taxation, and how tax-induced firm behaviour creates distortions to economic decision-making and optimal resource allocation on the Norwegian continental shelf. The underlying motivation lies in the specific features of the Norwegian Petroleum Tax Act (PTA), combined with the characteristics of petroleum companies, being vertically integrated and multinational. The general conclusion is that petroleum companies will have incentives to adjust their production structure for tax reasons as a result of systemic distortive properties of petroleum taxation and capacities for tax avoidance. Because the resulting corporate behaviour carries both concealment and efficiency costs, this results in a sub-optimal resource allocation on the shelf.

Natural resources provide a rare opportunity to raise tax revenue in a non-distorting manner. This is because natural resources are geographically immobile and fixed in supply. The economic value, after accounting for all costs of exploration, development and extraction, takes the form of a pure rent. Although a neutral tax on rents is easily applied in theory, it is difficult to put in practice. Among the problems, asymmetric information is a feature of all tax systems, and particularly evident in the resource sector where firms are vertically integrated and multinational. This provides companies with an informational advantage with the opportunity of avoiding taxes by shifting profits to maximize the value of tax deductions.

Tax avoidance and tax engineering activities have real effects on efficiency and operating activities of companies. Non-neutrality affects economic decision-making, and in consequence, resources and factor inputs, such as labour, natural resources and real capital may be used in a non-optimal way. Put differently, this means that companies adjust their production structure for tax reasons. In economics, *the excess burden of taxation*, also known as distortionary costs, is the economic loss that society suffers as the result of the tax. Thus, the potential costs of tax

engineering to society can be large. Therefore, it is important to evaluate the effects of the tax regime on the decision-making process of companies, both with respect to economic conditions, financing and profit shifting.

Using a theoretical approach, the thesis analyses the behaviour of a representative petroleum company, embedding strategies of tax avoidance, through transfer pricing and debt shifting, in a model that (closely) rebuilds the Norwegian Petroleum Tax Act. Assuming full certainty, a static model framework is employed, modelling the transaction flows between three tax jurisdictions: The offshore sector subject to the special tax regime, the onshore sector subject to ordinary taxation and a related financial centre domiciled in a low-tax jurisdiction. Modelling the choice of debt-to-asset ratios, transfer pricing and production structure, the company's decision-making process is analysed.

Through transfer pricing, petroleum companies will have incentives to excessively allocate costs to the offshore regime and transfer profits from petroleum production to the onshore sector as well as to related subsidiaries domiciled in low-tax jurisdictions. This is evident in the model through the mispricing of intra-group sales of petroleum and the overinvoicing of costs in intra-group services. Additionally, excessive allocation of fixed costs through insurance premiums contributes to transferring profits to tax haven affiliates.

The derived optimal capital structure outlines how tax allowances affect financing in petroleum companies, providing the answer to what degree this is essential for investment decisions. The offshore thin capitalization rule implies that companies would get interest deduction *as if* they had leverage equal to 50 per cent of offshore capital investments. The implication is that the companies will impose no leverage (internal or external) for any net tax gain lower than for the constant debt tax shield of this defined threshold. Only if the debt costs, incurred by increasing leverage to the threshold, are smaller than the net gain of exceeding it will companies incur leverage. The optimal mix of external and internal debt in this case is reached when the marginal cost of external debt is equal to the marginal tax payment in the internal bank. This implies that the external debt-to-asset ratio is in fact independent of the tax rate in the borrowing affiliate.

Applying a simplified production structure, oil production is derived from the use of three extensive factor inputs capturing the main phases of petroleum production: First, *exploration*

efforts (including seismic activity, exploration wells, field evaluation etc.) contribute to reserve growth. Second, the company may invest in *capital* to increase extraction in producing fields, contributing to a faster depletion profile of production. Additionally, the employment of an *intermediate input* provided by the onshore sector, comprising technology, services, rigs and other related activity, is necessary for the operational activity on the shelf. Assuming that companies maximize profits, firms determine their demand for factor inputs through seeking to produce the optimum level of output at the lowest possible cost. The effect of taxation on efficiency is thus measured theoretically by looking at distortive effects that the tax regime has on the equilibrium value where marginal revenue equals marginal cost, referred to as *tax wedges* for each factor input.

As a result of profit shifting in the sale of petroleum between the offshore and onshore sector, increasing the marginal value of petroleum, the use of all three factor inputs are increased. Moreover, the use of the intermediate input is further incentivised by a reduction in the effective marginal cost induced by transfer pricing in this factor. For capital investments, the main differences between offshore- and onshore capital investments are the additional special tax (51 per cent) and beneficial deductions (tax credits) given in the offshore regime. Tax credits include both faster depreciation allowances and uplift. Because the systemic features of the tax system and additional favourable financial deductions, the offshore marginal effective capital costs are reduced compared to the onshore sector, leading towards a disproportionate capital allocation to the offshore regime.

Resulting from multiple adaptations of the optimal offshore capital structure, this implies two different scenarios also for distortions from offshore financial deductions. If the firm finds it profitable to incur no leverage, tax distortions arise from denying full deductibility of capital given by the threshold of the thin capitalization rule. For any excess leverage above the threshold, distortions are more complex. Excessive debt financing will mitigate distortions on the margin caused by the lack of tax deductibility of equity, but imposes wasteful resource allocation through the incurred costs of the external and internal debt financing. Counteracting the complex distortions by the uplift seems implausible, and as a result, it may well be that the system fails to isolate the resource rent and turns into a capital subsidy on the margin. Hence, one policy conclusion could be to allow for full deductions of capital costs (debt and equity) in order to

make sure that distortions are eliminated, instead of vaguely approximating the normal rate of return by combining different tax instruments.

Tax distortions in single factor inputs will influence the demand for other inputs. The optimal relative factor input choice will depend on the technology and structure of the offshore petroleum production. The model suggests a higher capital- and intermediate-input intensity compared to exploration efforts. This implies that firms are overinvesting in existing fields, but might leave too many fields undiscovered. The implication could be that petroleum production in existing fields is excessive. However, the model results may be biased by disregarding the refund scheme for exploration, or by other model assumptions.