

Taxation and Investment Decisions in Petroleum

Graham A. Davis, Colorado School of Mines, 303 499 0144, gdavis@mines.edu
Diderik Lund, University of Oslo, diderik.lund@econ.uio.no

Overview

When governments apply high tax rates targeted at natural resource rent, there must be generous deductions in order to avoid investment disincentives. How generous is disputed. Based on standard theory and recommendations from the OECD and the IMF, the value of future deductions depends on the risks of these, and the companies' after-tax weighted-average cost of capital cannot be applied directly. As an example, a simple model quantifies the difference between pre-tax and post-tax systematic risk when tax deductions are less risky than pre-tax cash flows. Osmundsen et al. (2015) suggest that the difference must be ignored by oil companies, since they cannot find the separate market values of tax deductions. But companies operating in different jurisdictions cannot then appreciate differences in tax systems, not even approximately, which will lead to suboptimal decisions. Tax designers may instead assume that companies gradually adopt more adequate methods.

Methods

Finance theory, literature review, financial modelling, Capital Asset Pricing Model.

Results

We show that past literature, past guidelines for taxation, and financial modelling all conclude that petroleum firms should and do take into account the details of depreciation shields when deciding upon investment discount rates. The suggestion by Osmundsen et al. (2015) that they do not is at odds with the evidence. We also produce a model of oil project CAPM betas under both certain and uncertain depreciation schedules, and show that the differences are substantial.

Conclusions

International organizations like the IMF and the OECD, as well as leading tax experts, as expressed in the Mirrlees Review, have given recommendations on tax reforms, both for business taxation in general and for taxation of natural resource rent. An explicit underlying assumption has been to regard future tax deductions as much less risky than other cash flow elements, from the firms' point of view. Some references have regarded the deductions as risk free, while some have pointed out the risk that the tax value of deductions may not be earned effectively if the firm never pays taxes.

In designing a petroleum tax system, the Ministry of Finance of Norway is largely in accordance with the advice of the IMF and the OECD. Tax deductions are carried forward with interest, and if an oil company closes down before earning the tax value of these, the balance is refunded. As long as current rules are unchanged, this means that deductions are risk free. Large refunds have been made and received public attention, but the system has survived a change of government between the two largest political blocks, so the political risk connected to these deductions seems to be small. Much of the criticism from Osmundsen et al. (2015) is misplaced, not only in principle, but in practice.

Since firms behave differently and adopt new methods gradually, tax authorities cannot rely on all firms behaving according to one theory. Competition between firms can help so that firms adopting the more advanced theories will outperform other firms. There is no guarantee that this will work perfectly, but the alternative suggested is to rely on firms being stuck with outdated methods (—using one discount rate in all jurisdictions for all projects—) which are denounced by standard textbooks. Firms have an interest in exaggerating their required returns. If authorities base taxation on the claims that are put forward, there will be some cases of overinvestment, i.e., firms investing more, at the margin, than they would have done in the absence of rent taxation since such taxation turns into a subsidy. If authorities base taxation on the theories suggested here, some firms may not realize the potential values, and there may be underinvestment at the margin. Neither of these deviations is desirable, but the potential harm is low, either way. After all, close to the margin, the net deadweight losses are low. In a wider context it may be better to base

taxation on the theories suggested here and encourage firms that adopt newer methods, as they will undoubtedly use decision methods over all aspects of asset management that produce results closer to the optimum.

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