

Investment Allocation with Capital Constraints. Comparison of Fiscal Regimes

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The dramatic fall in oil prices after 2014 has led to more extensive capital rationing in international oil companies, and subsequent fierce competition between resource extraction countries to attract scarce investment. This situation is not adequately addressed by the large general literature on international taxation and multinational companies, since it fails to take account of capital rationing in its assumption that companies sanction all projects with a positive net present after-tax value. The paper examines the effect of tax design on international capital allocation when companies ration capital. We analyse capital allocation and government take for four equal oil projects in three different fiscal regimes: the US GoM, UK upstream and Norway offshore. Implications for optimal tax design are discussed.

The analysis examines the portfolio investment decision when applying a formal portfolio model and when using industry metrics. Our analysis seems to confirm textbook warnings against using internal rate of return (IRR) as decision criteria; we find that the IRR metric yields the lowest portfolio net present value (NPV). In our analysis the net present value index method (NPVI) yields the same choices as the portfolio maximization approach. We also find that the breakeven price method (BEP) corresponds to the NPVI method when investments are calculated on an after-tax basis.

The paper also casts light on current petroleum tax systems. Starting off with a mathematical portfolio optimisation model, we find that no Norwegian projects are developed with the tightest capital constraint (USD 40 billion), while three in the UK and two in the USA will be. With a less stringent capital constraint of USD 70 billion, the same two projects in the USA are developed, all four in the UK, and only the large project in Norway.

So, what are the implications of our research for petroleum tax design? Our analysis has some immediate implications for tax levels. We find that strict capital rationing by oil companies leave profitable fields undeveloped. The suboptimal investment level is likely to instigate tax reduction which may develop into tax competition between resource rich countries. On the basis of our analysis, one might in particular question the competitiveness of the Norwegian fiscal regime. This concurs with recent observations; the majors are reducing their presence on the Norwegian shelf. The US authorities, on the other hand, should worry about cream-skimming, since projects perceived to be marginal by capital-rationing oil companies—and which therefore fail to be sanctioned—may be profitable for society.

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