

THE RELATIVE INEFFICIENCY OF PETROLEUM TAXATION IN LATIN AMERICA AND THE CARIBBEAN

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Overview

This paper examines the effectiveness of petroleum taxation policies in thirteen Latin American and Caribbean energy-producing countries. We focus on the ability of each country's system of taxation (i.e., fiscal regime) to foster development of petroleum resources in a manner that efficiently exploits the resource while allowing appropriate flows of project rents to the government. The innovation of the paper is to take actual project design and geology into account, with the resource geology specific to each country studied, and allow the private operator to avoid taxes by altering that design. We analyze 30 petroleum projects and compare the distortionary impacts on those 30 projects with the distortionary impacts of these countries' fiscal regimes on 15 mining projects. The results reveal the relative inefficiency of petroleum fiscal regimes.

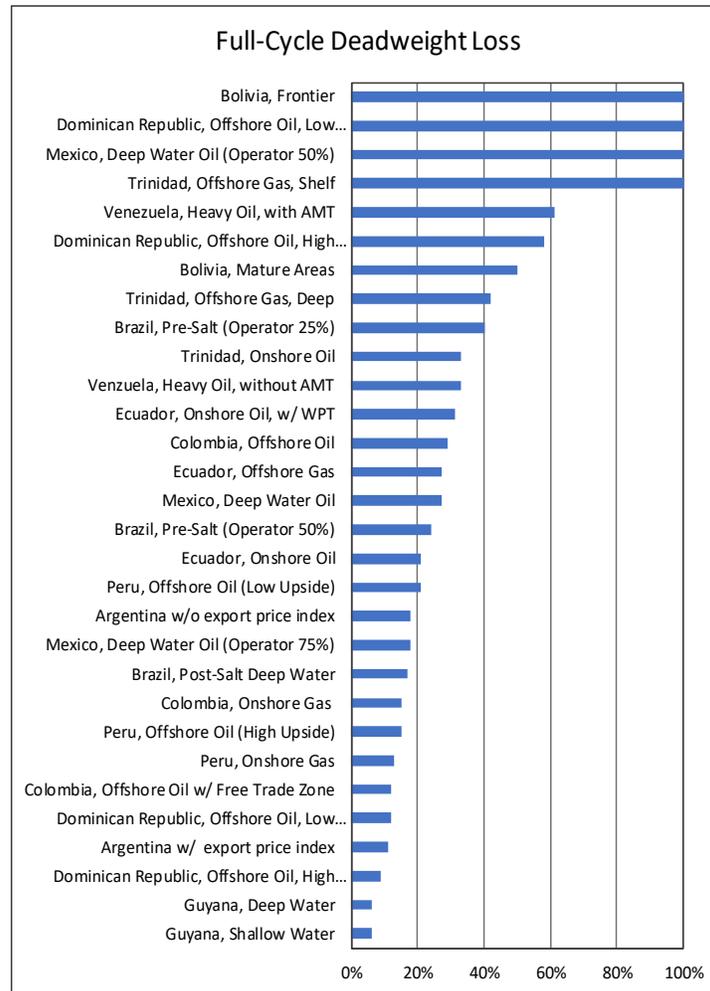
Methods

Following the methodology outlined in Smith (2014), we model mining and petroleum project engineering production functions unique to each LAC country studied and apply that countries' current fiscal regime to the projects. The project operator is assumed to maximize after-tax project value by varying the investment and operating choices available in the modelled production function. In petroleum, design choices include exploration, development, enhanced oil recovery, and production rate. In mining the choices include development, production rate, and cut-off grade. The results are analysed for best practices and lessons learned. To aid in the analysis we emphasize fiscal inefficiency (deadweight loss per dollar of government revenue) and fiscal yield (dollars of government revenue as a share of project rent in the absence of taxes).

Results

The fiscal regimes in LAC are complex and vary widely from country to country, both in design and the rate of taxation. None of the fiscal regimes studied are limited to a resource rent tax. As a result, they are all distortionary. Because it allows for recovery of investment, corporate income tax is the least distortionary tax instrument applied. Gross royalties are the most distortionary. Operator responses to the more distortionary instruments are in many cases dramatic. Some projects are estimated to be curtailed completely. Others have significantly reduced investment and production, with large deadweight losses (see the following figure, which shows the results for the modelled petroleum projects at the exploration stage). In almost all cases the fiscal regimes sterilize reserves. The petroleum fiscal regimes are much more aggressive than the mining fiscal regimes. The result is tremendous inefficiency in petroleum tax collection in some countries, where each dollar of tax income causes more than one dollar of deadweight loss on average. There is a taxation Laffer curve. Guyana has the least aggressive and least distortionary petroleum fiscal system, while several countries' fiscal systems extinguish petroleum exploration for marginal fields. Production royalties are the most distortive instruments and are ubiquitous within the petroleum fiscal regimes studied.

Project Deadweight Loss (Petroleum)



Conclusions

Most of the petroleum fiscal regimes in LAC are highly distortive of investment and production decisions. In comparison the mining fiscal regimes, because of their less aggressive rates of taxation and greater focus on corporate income tax as a main source of government revenue, are less distortionary. We estimate that for many projects of each type both the project operator and the government could enjoy more project rent, in a win-win outcome, if the fiscal systems were redesigned with efficiency in mind. Resource rent taxes are the obvious choice, but failing that a corporate income tax with accelerated depletion and no limits on loss carryforwards, supplemented by a surtax to increase government take, is a reasonable second-best option.

References

Smith, James L. "A Parsimonious Model of Tax Avoidance and Distortions in Petroleum Exploration and Development." *Energy Economics*, 43 (2014), 140-157.