

DEVELOPING ALBERTA'S OIL SANDS: WHO BEARS THE RISK?

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Overview

In many parts of the world, including Alberta, royalties and taxes shape the distribution between developers and governments of net benefits generated by the development and production of crude oil reserves. In a recent paper, Plourde (2009) examines the consequences for the distribution of ex ante economic rents associated with stylized projects of different royalty and tax regimes either proposed or implemented in Alberta's oil sands since the mid-1990s.

A related set of issues concerns the sharing of the consequences of changes in cost and revenue conditions under different approaches to government revenue collection. In jurisdictions where governments act as agents for the resource owners, this amounts to asking how royalties and taxes affect the distribution of cost and price risks between developers and owners. The key objective of this paper is to address these issues in the context of the development and production of Alberta's oil sands. Computer simulation models are used to shed some light on the risk-sharing properties of specific royalty and tax regimes of relevance to oil sands activities in Alberta since 1997.

Methods

The simulation models used in this paper are versions of those described in Plourde (2009) for a surface mining operation and for an *in situ* production plant (specifically, a steam-assisted gravity drainage, or SAGD, facility). These models also include detailed representations of three royalty and tax regimes that were either applied or proposed for oil sands activities.

To establish a basis of comparison for the results of analysis to be undertaken the paper, estimates of the distribution of (real, discounted) divisible income between developers/producers and governments (federal and provincial combined) are first considered. Simulations of both SAGD and surface mine models are performed for real (2007) WTI prices of \$(US) 50 to \$(US) 150, in five-dollar increments. The three royalty and tax systems described earlier are each considered in turn in this simulation work.

The effects of six pairs of cost and revenue "shocks" on divisible income are simulated using the same models of stylized SAGD and surface mining operations. Results are reported and discussed for a subset of these shocks.

Results and Conclusions

The results suggest that there is a direct relationship between the share of divisible income accruing to one of the parties (producers or governments) and the risk (that is, the share of the change in divisible income) shouldered by that party with respect to possible cost/revenue shocks.

A characteristic of the three royalty and tax regimes considered is that, for a wide range of circumstances, producers bear a larger share of the risk associated with cost/revenue shocks (in the sense that they shoulder a greater proportion of the resulting effects on divisible income) than the portion of divisible income that accrues to them in the absence of such shocks. The reverse is true for both provincial and federal governments individually under all three regimes: each bears a smaller share of the risk than the proportion of divisible income that it is estimated to capture in the absence of shocks.

The exposure of producers to variations in capital expenditures is here estimated to be greater than their exposure to changes in other cost and revenue/price factors. Producers thus appear to bear proportionately more of the risks associated with capital expenditure shocks than those linked to the other types of shocks considered in this paper.

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