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Commodity Price Volatility with Endogenous Natural Resources☆

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Abstract

Natural resource reserves are exogenous in models of small commodity exporters. Changes in the stock of reserves play no role in the macroeconomy including in business cycle volatility, trade dynamics or exchange rate volatility. We consider richer supply dynamics and model exploration and depletion. We show that an endogenous supply of reserves is important for capturing the stylised facts associated with commodity price shocks including a commodity currency, the crowding-out of non-commodity activity (Dutch-Disease) and a volatile business cycle.

We also consider how exploration and depletion affect the ranking of optimal monetary and taxation policies. When natural resource reserves are held fixed, monetary policy is an efficient tool for stabilising the effects of commodity price shocks. However, when exploration and depletion are accounted for, using interest rates to stabilise the effects of commodity price changes becomes inefficient. Using taxes on the resource sector, specifically an ad valorem royalty, remains efficient.

Keywords: Commodity currencies, commodity prices, Dutch Disease, non-renewable resources, optimal policy.

JEL Codes: E63, F41, Q33, Q38

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