

[Optimal Monetary Responses to Oil Discoveries](#)

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How should monetary policy respond to an oil discovery? With rapid technological advances in fracking, oil and gas discoveries are now a major issue in many developed countries. They are also important more generally, particularly in the quarter of the world's economies dominated by natural resources. Much has been written about the long term effects of oil discoveries on growth, de-industrialisation and governance. However, these discoveries also have important short-term effects. A particular challenge is that oil discoveries provide some news about the future (they are "news shocks"), because there is typically a delay between discovery and production. If the government does not smooth expenditure during this delay then the anticipation of oil revenues will affect the economy in advance.

This paper has three stages: it characterises oil discoveries, shows that they can cause a recession and illustrates how monetary policy should respond.

The first stage shows that oil discoveries should cause the real exchange rate to appreciate twice: when households learn they are wealthier and when oil revenues are eventually spent by the government. Each stage creates additional demand for goods produced at home, causing their price to rise relative to foreign goods - a "real appreciation".

The second stage shows that good news about future oil production can create a recession today under common monetary policies, because of forward-looking inflation. If the currency is pegged then a real appreciation cannot happen via the nominal exchange rate, so must happen through firms' prices instead. As these can only adjust slowly, prices start rising in advance, suppressing demand and creating unemployment. This is important because 74% of resource-exporters peg their currency. If the central bank tightens aggressively in response to inflation (a simple Taylor rule), then unemployment will be made worse.

Unemployment and inflation following oil discoveries has been observed in practice, such as after shale gas fracking was discovered in the US. After fracking was first demonstrated in the Barnett Formation (TX) in 1998 there was an increase in both unemployment and inflation in the surrounding counties relative to the national average. This dissipated before large scale production began.

The third stage shows that optimal policy is closely approximated by a Taylor rule that responds to expected changes in the natural level of output. In this case the central bank temporarily loosens interest rates just as oil revenues start to be spent. This causes the anticipated real appreciation to happen through the nominal exchange rate. Firms therefore do not need to raise their prices in advance, avoiding the costs of inflation and the associated unemployment.

Optimal monetary policy requires the central bank to credibly commit today to what it will do tomorrow. If the central bank is not credible, then it will try to exploit the foreign-denominated oil revenues by appreciating the exchange rate every period. This creates a bias in inflation, which is very costly. Thus, resource-exporters are better off pegging their exchange rate than having a central bank that is not credible. This may help to explain why 74% of resource-dependent exporters peg their currency.