# Monetary policy, oil price shocks, and the Japanese economy

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## Abstract

Hamilton's [J. Monetary Econ. 38 (1996) 215] measure of oil price shock is statistically significant in explaining real activity in Japan and also has a statistically significant impact on the stance of Japanese monetary policy. It is estimated that the call money rate was higher by 2.0 percentage points due to the first major oil price shock in the mid 1970s and was higher by about 2.5 percentage points due to the second major oil price shock in 1979–1980. It is found that between 30 and 50 percent of the negative impact of oil price shocks on Japanese output is attributable to monetary tightening induced by oil price shocks. This result continues to hold when the effects of domestic fiscal policy, US monetary policy, and exchange rate regime are recognized. © 2001 Elsevier Science B.V. All rights reserved.

## 1. Introduction

A large body of empirical evidence indicates that oil price shocks are related to slowdowns in output growth. Hamilton (1983) found that oil price shocks and real economic activity have been strongly correlated in the United States since World War II, even in the period 1948–1972 prior to the first oil price shock. More recently, Hamilton (1996) has recognized that oil price changes are an unreliable instrument for capturing the macroeconomic influence of oil shocks subsequent to 1986. He finds that a new variable,

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"net oil price increase", has a statistically significant negative relationship with GDP growth from 1948:1 to 1994:2 which strengthens his earlier conviction concerning the macroeconomic importance of oil price shocks in the US economy.[1,2]

Oil price shocks have also been found to have influence on real activity in other countries. Burbidge and Harrison (1984) find that oil price rises have a statistically significant effect on industrial production in the US, Japan, Germany, the United Kingdom, and Canada, and Hutchison (1993) and Takenaka (1991) find that oil price shocks influence real GDP in Japan.[3] Following similar work for the US, Mork et al. (1994) report asymmetric effects of oil price shocks in a number of countries. They find a statistically significant negative correlation between oil price increases and GDP growth (but no statistically significant effect of oil price decreases) for the US, Canada, Japan, West Germany, France, the UK, and Norway over the period 1967 through 1992.[4] Thus, the evidence that oil price shocks play a significant role in explaining macroeconomic activity is well established for a number of countries, including Japan.

In a related work, Hoover and Perez (1994) note that US recessions of the past 30 years have been preceded by oil price increases and by contractionary monetary policies. This raises the question as to what extent the ensuing economic declines can be attributed to oil price increases and to tight monetary policies.[5] Bernanke et al. (1997) set out to answer this question. They find that Hamilton's net oil price increase is the most appropriate indicator for investigating the macroeconomic effects of oil prices in the US, and that a positive innovation in oil prices is followed by a rise in the federal funds rate. Bernanke et al. estimate that most of the impacts of oil price shocks on the real economy are attributable to the Fed's tightening in response to adverse oil price shocks. They find that between 2/3 and 3/4 of the reduction in US output following an oil price shock is accounted for by the monetary policy tightening in response to adverse oil price shocks.

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[1] The net oil price increase is defined as the percentage increase of oil price over the maximum of the last four quarters. If the current price is less than the maximum of the last four quarters, the net oil price increase takes a zero value.

[2] A number of authors have investigated the influence of oil price shocks on the macroeconomy as well as that of the issue of the appropriate measure of oil price shock. Contributions include work by Darby (1982) and Dotsey and Reid (1992) on the macroeconomic effects of oil price shocks, Mork (1989) and Mory (1993) on asymmetric effects of oil shocks, and Hooker (1996, 1997) and Federer (1996) on the robustness of the effects of oil shocks over time.

[3] These authors reach the conclusion that oil prices influence real activity in Japan even though their data, methods, and definitions vary. Burbidge and Harrison (1984) utilize a seven-variable VAR model using monthly data for the period 1961:1–1982:6. A uniform measure of oil price shocks for all countries given by the ratio of the Saudi Arabian price, in the US dollars per barrel, to a weighted average of the consumer price Indices in the five countries studied. Hutchison (1993) uses a four-variable VAR with quarterly data over 1964:2–1990:1 and Takenaka (1991) analysis is descriptive. Komine (1981) discusses the duration of the effects of oil price shocks on the Japanese economy.

[4] Mork et al. (1994) finding of an asymmetric effect of oil price movements was reasonably robust in most countries. The negative effect of oil price increases appears to be stronger for the US, Canada, and the UK than for the other economies including Japan.

[5] There has been a well-known debate on this issue. Romer and Romer (1989) argued that exogenous tight monetary policy is the primary cause of US economic contractions. Hoover and Perez (1994) show that the Romer and Romer (1989) approach cannot discriminate between monetary and nonmonetary shocks as a source of recessions by showing that oil shocks produce results of the same character as the monetary shocks that Romer and Romer identified.