

# Asymmetric effects of monetary policy shocks across US States

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The aim of this paper is to assess the impact of monetary policy across US States. From a theoretical point of view, policy changes may affect States differently due to their heterogeneity in their industry-mix and their financial networks.

To test for this hypothesis, we use an unbalanced panel of 51 US States from 1969 to 2008, estimating the dynamic response of changes in personal income to policy shocks, controlling and interacting for States' structural variables and specific variables associated to monetary policy shocks transmission.

The paper follows the method proposed by Jorda (2005), which consists of estimating Impulse Response Functions (IRFs) based on local projections of the effect of monetary policy shocks on changes in personal income. We analyse the spatial distribution of the shocks accounting also for spatial interactions among States as proposed by Brady (2011, 2014).

In detail, in the first part, to establish the impact of monetary policy, for each future period  $k$  we estimate an equation where the change in States' personal income through time is regressed against a measure of unanticipated changes in policy rates, an autoregressive component to capture persistence and a set of controls.

In the second part of the paper, to take into account the role of several transmission channels in shaping the response of States to monetary policy shocks, we allow the interaction between policy changes and economic conditions. The set of such variables includes, the industry mix, the broad credit channel, the bank lending channel, the housing market channel and the initial level of income.

We find clear evidence of the asymmetric effects of monetary policy shocks across States and the presence of significant spatial effects. After a slight initial rise, monetary policy tightening generally leads to a long-lasting decrease in State's real personal income. The maximum effect is generally reached 8 quarters after the shock. In addition, our results suggest larger contractionary effects of monetary policy tightening in States with higher manufacturing share, smaller firms, smaller banks, higher house prices, and higher income.

**Keywords:** Monetary policy shocks, Transmission channels, Regional Asymmetries

**JEL Classification:** E52, R11, R12

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