

Identification of Financial Factors in Economic Fluctuations

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The views expressed in the paper are not necessarily the views of Norges Bank

- Recently, the financial sector has been seen also as a **source of shocks** (Christiano, Motto and Rostagno, 2014, Jermann and Quadrini, 2012)
 - Several kinds of financial shocks, all implying **investment and stock market booms**
- In this paper we consider financial shocks in a sign restricted VAR (Sims, 1980)
 - First step: one general financial shock
 - Second step: disentangle different financial shocks
- Contribution
 - Credit shocks, housing shocks and uncertainty shocks in the same framework
 - Size of the system and magnitude restrictions with restrictions on ratios

The model

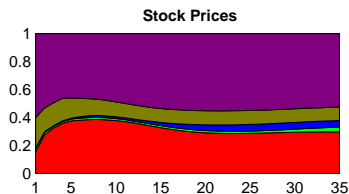
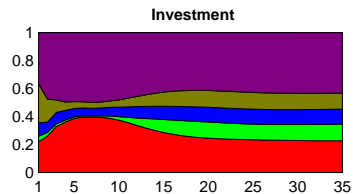
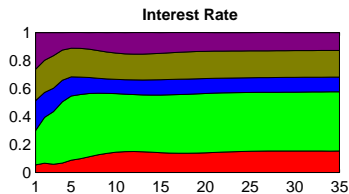
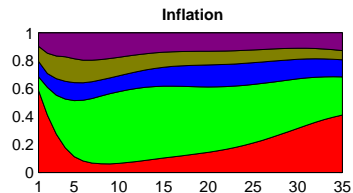
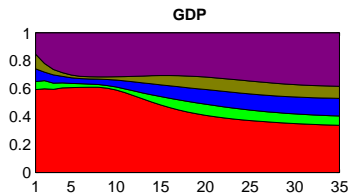
- Bayesian VAR in levels with 5 lags
- Minimum set of sign restrictions imposed only on impact
- 5 variables (output, GDP deflator, interest rate, investment, stock returns) in the baseline
- 5 shocks: supply and four kinds of demand shocks in the baseline
- Data: 1985 Q1-2011 Q4 quarterly for the US
- Priors: Uninformative priors.

Restrictions in the baseline model

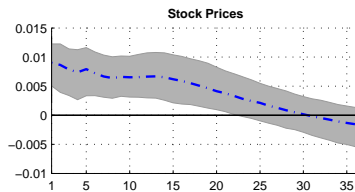
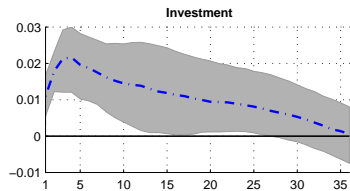
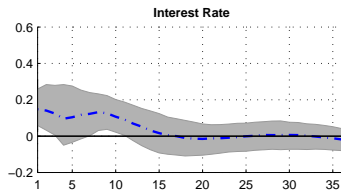
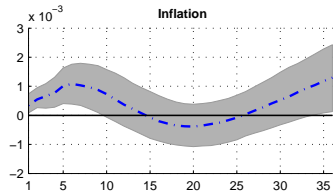
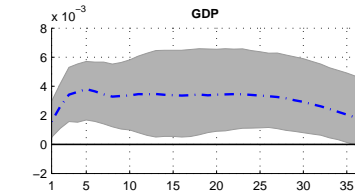
- Financial shocks create an investment boom and a stock market boom (consistent with all financial shocks in the literature)
 - Shocks to the demand of capital
- Theory: investment shocks move output and stock prices in opposite directions
 - Shocks to the supply of capital (Christiano, Motto and Rostagno, 2014)
- Restrictions:

	Supply	Demand	Monetary	Investment	Financial
GDP	+	+	+	+	+
GDP deflator	-	+	+	+	+
Interest rate	NA	+	-	+	+
Investment/Output	NA	-	NA	+	+
Stock market	NA	NA	NA	-	+

Variance Decomposition



IRF financial shocks



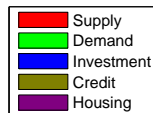
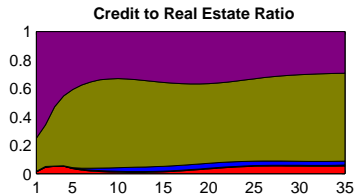
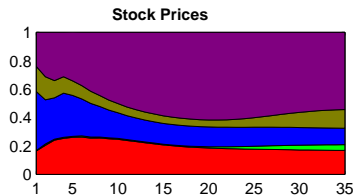
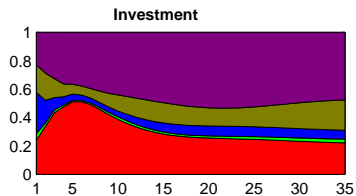
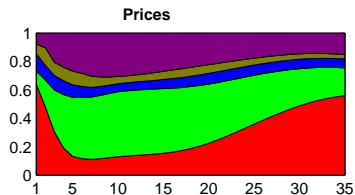
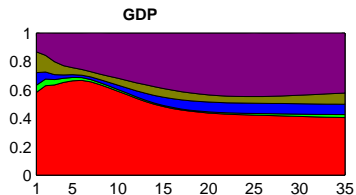
Next step: disentangling financial shocks

- Our financial shock is consistent with several possible stories
 - Originating in the housing market? (housing demand shocks as in Iacoviello and Neri (2009), Liu, Wang and Zha (2013); bubbles; decline in productivity in the housing sector)
 - Originating in the credit markets? (loan to value ratio shocks, financial liberalization, credit supply shocks)
 - Uncertainty (risk) shocks? (Bloom, 2009, Christiano, Motto and Rostagno, 2014)
- Our next objective: disentangle different kind of financial shocks
 - we remove the monetary shock from the system to include more financial shocks

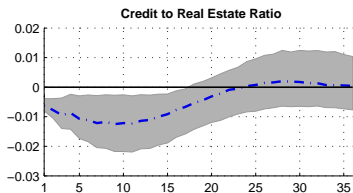
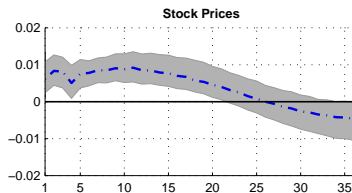
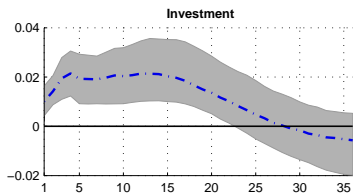
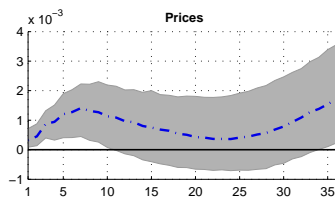
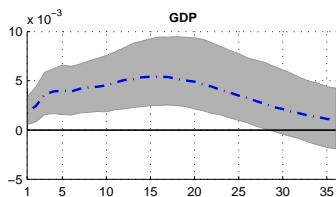
Disentangling financial shocks I: credit vs housing

- $\frac{\text{Credit}}{\text{Real Estate Value}}$
- Credit shocks have a larger effect on the numerator
 - Limited response of house prices to credit shocks
- Housing shocks have a larger effect on the denominator
 - Sluggish response of credit
 - No endogenous relaxation of credit standards

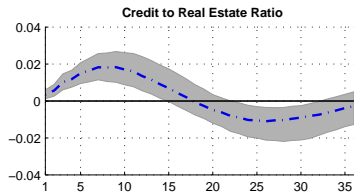
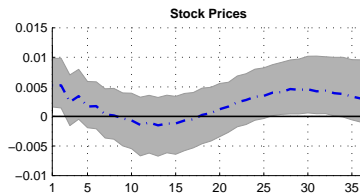
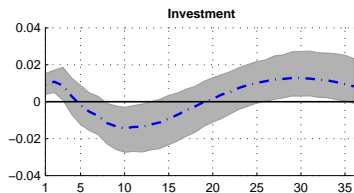
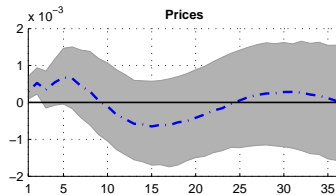
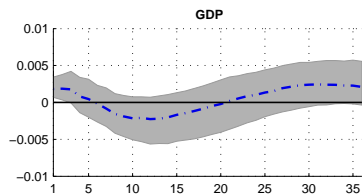
Variance decomposition



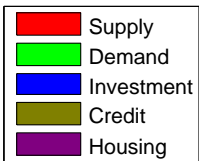
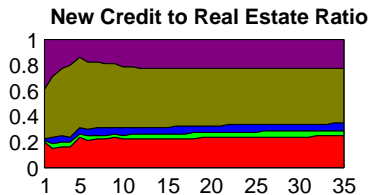
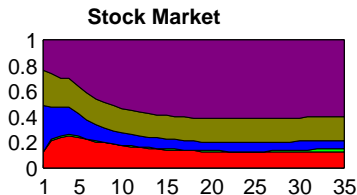
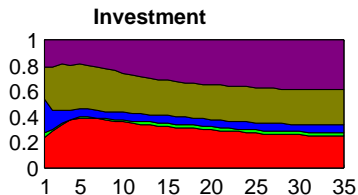
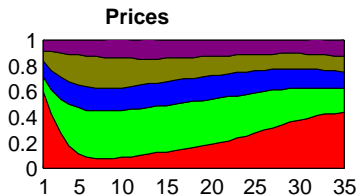
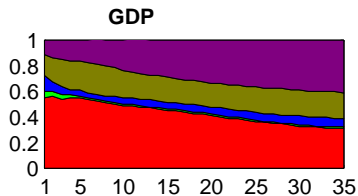
IRF housing



IRF credit



Cross-check: the slow-moving nature of credit



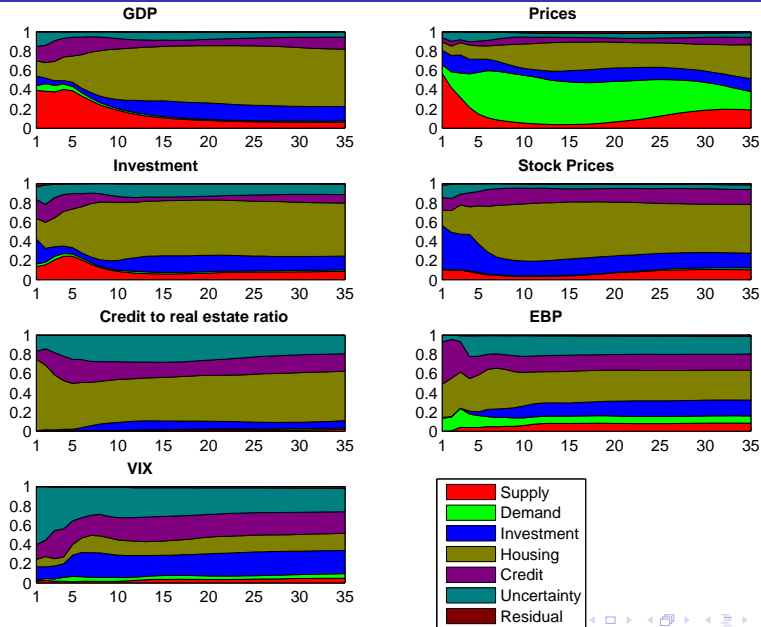
The interpretation of housing shocks

- Housing demand shocks (Iacoviello and Neri, 2010)
- Bubbles
- Low productivity in the construction sector (Galesi, 2014)
- Global saving glut

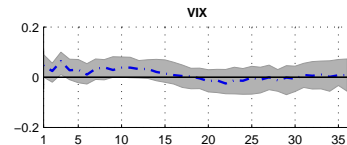
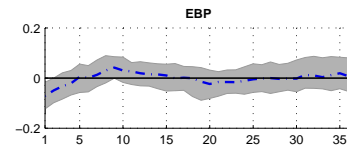
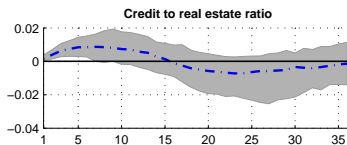
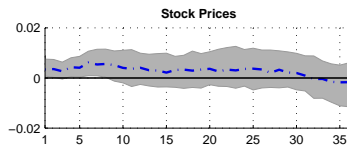
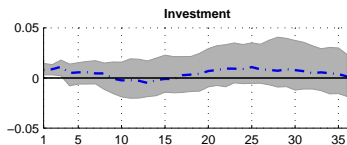
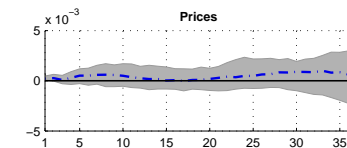
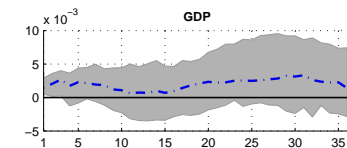
Disentangling financial shocks II: uncertainty vs credit vs housing

- $\frac{EBP}{VIX}$
- Positive credit shocks and positive uncertainty shocks both lower EBP and VIX...
- ...but EBP responds more to credit shocks
- ...and VIX responds more to uncertainty shocks
- Similar to Caldara, Fuentes-Albero, Gilchrist and Zakrajsek (2014)

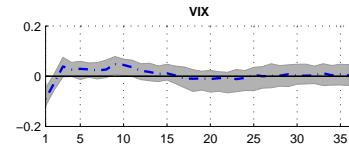
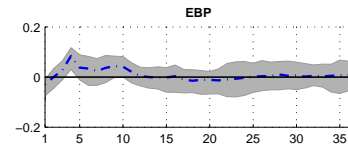
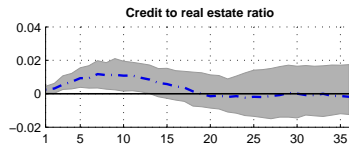
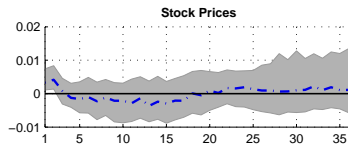
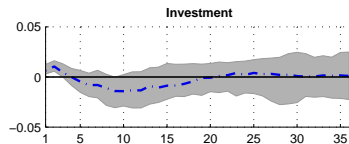
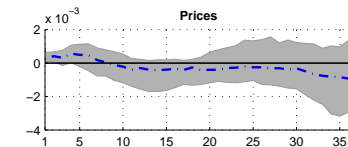
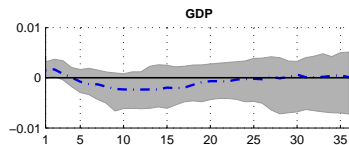
Variance Decomposition



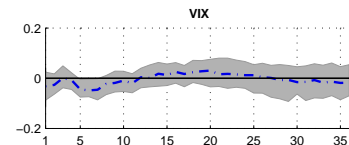
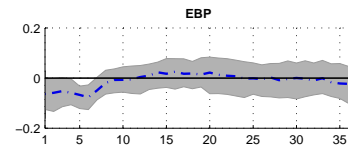
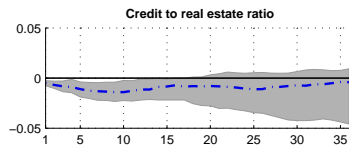
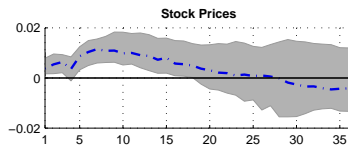
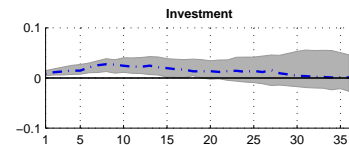
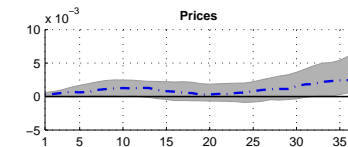
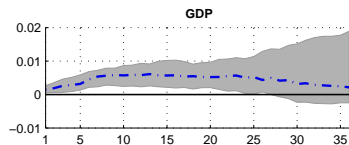
IRF credit shock



IRF uncertainty shock



IRF housing shock



- We have identified (several) financial shocks in a sign restricted VAR
- Financial shocks are important
- Financial shocks are non-inflationary
- Interpretation of financial shocks: support for housing shocks
- No support for uncertainty shocks and VIX is not driven by only one shock