

Monetary Policy, Asset Prices and Macroeconomic Conditions: *A Panel VAR Study*

Katrin Assenmacher-Wesche
Swiss National Bank

Stefan Gerlach
IMFS and CEPR
University of Frankfurt

Using Panel VARs (PVAR) to look at issues concerning monetary policy and asset prices:

A-W & G (2008a): importance of financial structure?

A-W & G (2008b): role of credit & international transmission of shocks?

A-W & G (in progress): non-linearities?

Motivation

- Asset prices provide a link through which macro economic shocks can cause financial instability.
 - AP collapses have played a key role in many episodes of financial instability.
 - AP booms raise the risk of a “correction,” triggering defaults among borrowers and banks.
 - AP bubbles can be spotted, e.g. by looking at credit.
- Policy prescription:
 - Use monetary policy to lean against AP bubbles!

Raises many questions:

1. Does monetary policy impact predictably on AP?
 - a) Do APs react “quickly” to monetary policy?
 - b) Do different APs react at the same rate?
2. Are the interest changes necessary to stabilize AP so large as to raise output and inflation volatility?
3. Do credit shocks have large implications for APs and macroeconomic conditions?
4. How do AP shocks impact on the economy?
5. How are US shocks transmitted internationally?

Objectives

1. Study CPI, GDP, credit, 3-m interest rate, property & equity prices.
 - Estimate a PVAR for 17 countries:
 - Australia, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, UK and US.
 - Quarterly data for 1986-2006.
 - Tool to summarise the data.
2. Evidence on transmission of US shocks.

Some Related Literature

Goodhart and Hofmann (2007):

Cross-country studies of the role of AP.

Goodhart and Hofmann (2008):

Panel VARs; same 17 countries.

All variables endogenous and correlations high.

Need to understand structure.

Some differences:

Variables:

Equity prices instead of money.

Treatment of data:

Levels; property prices $I(2)$.

Estimation:

Slope heterogeneity and serially correlated regressors give rise to bias in the case of the standard fixed-effect estimator.

Mean group estimator of Pesaran and Smith (1995).

Parameters differ randomly across countries; seek to estimate mean.

Ordering.

Shortcomings

Assume a single regime.

Non-linearities and asymmetric responses?

G&H (2008) use “boom dummies.”

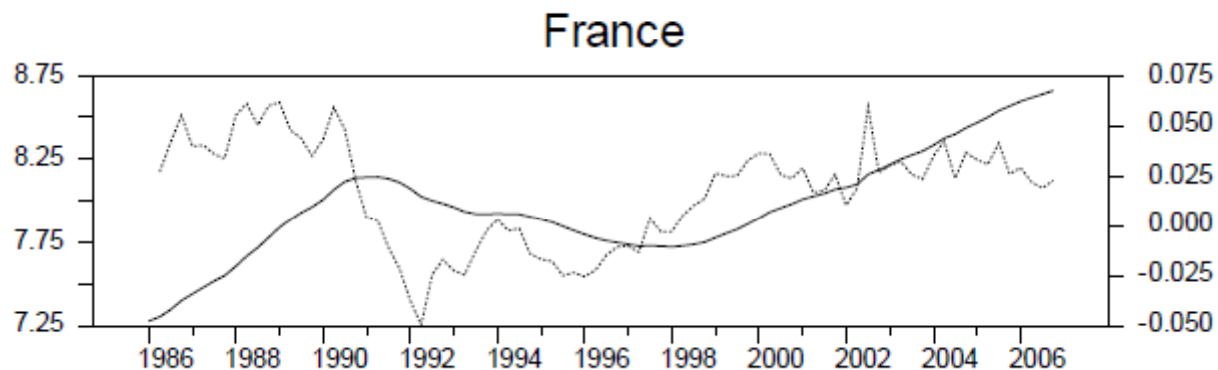
Kaufmann and Valderrama (2007) allow for MS.

Lucas critique:

Behaviour of economy may (or may not) change if a *leaning-against-the-wind* policy is adopted.

I. PVAR Analysis

- Six variable system:
 - CPI, real GDP, credit, 3-month interest rate, property prices & equity prices.
 - Property prices appear to be I(2).
 - More work needed on order of integration.

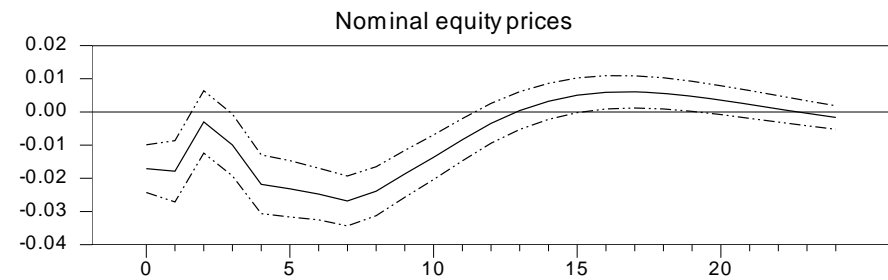
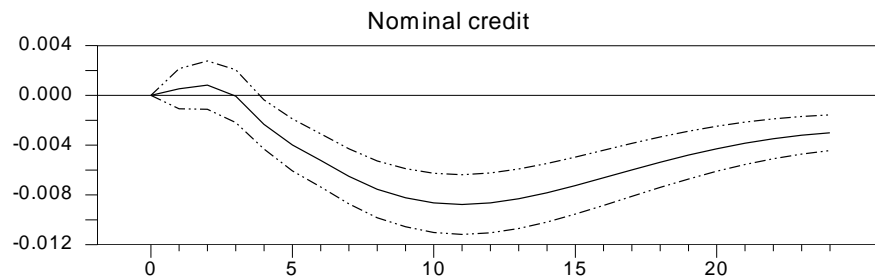
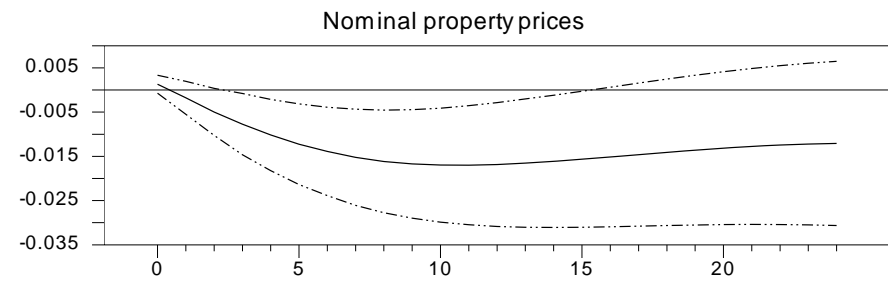
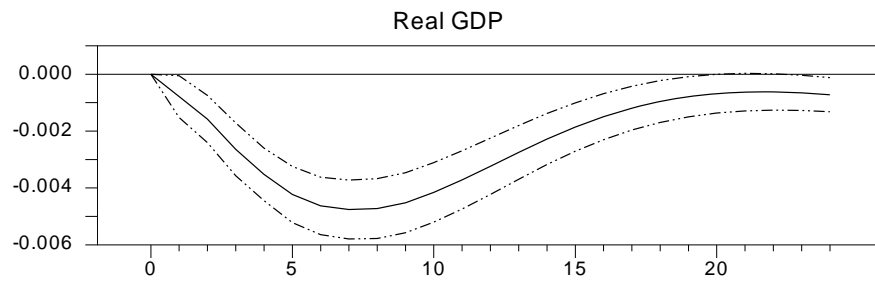
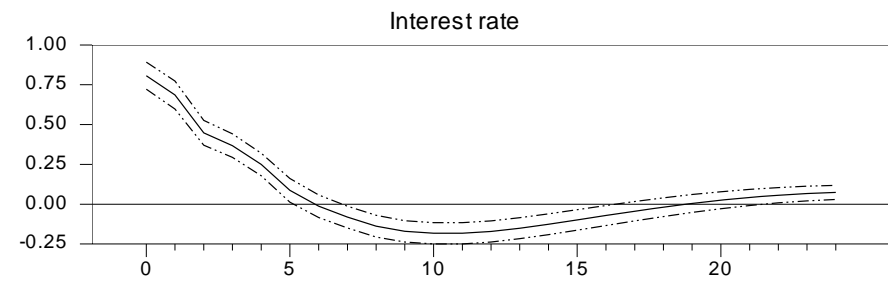
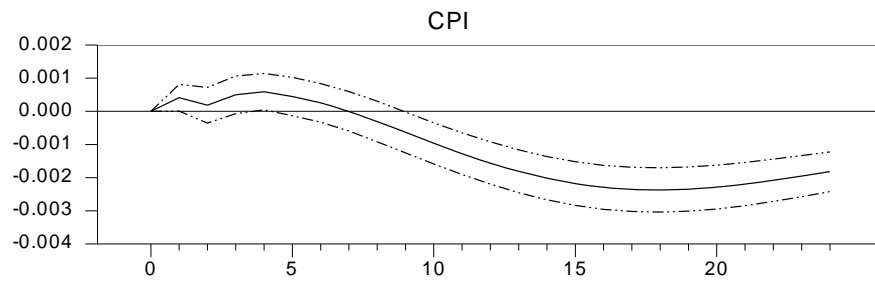


- Standard recursive identification scheme:
 - Interest rate ordered after CPI, GDP and credit but before residential property and equity prices.
 - Contemporaneous correlations:

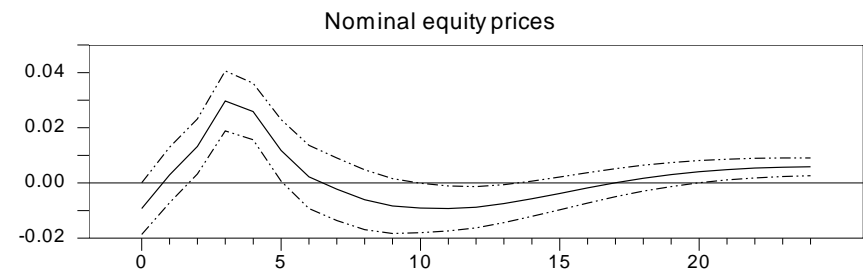
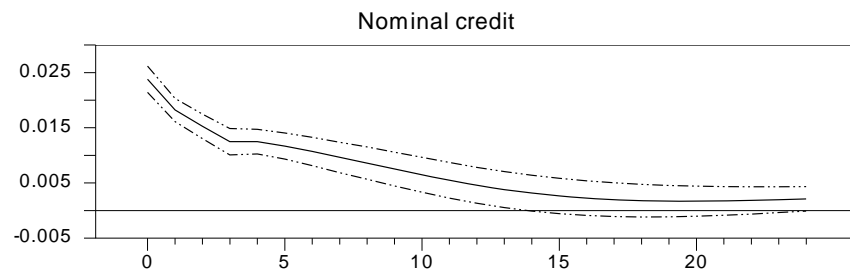
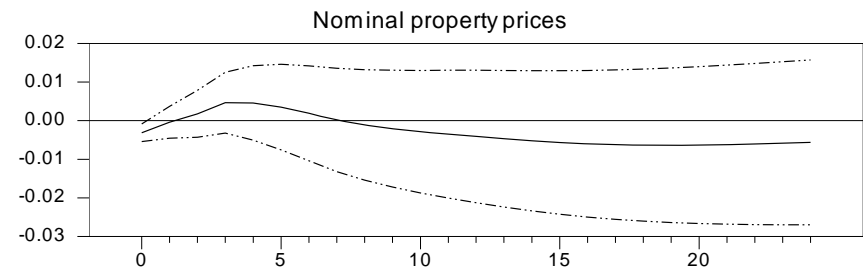
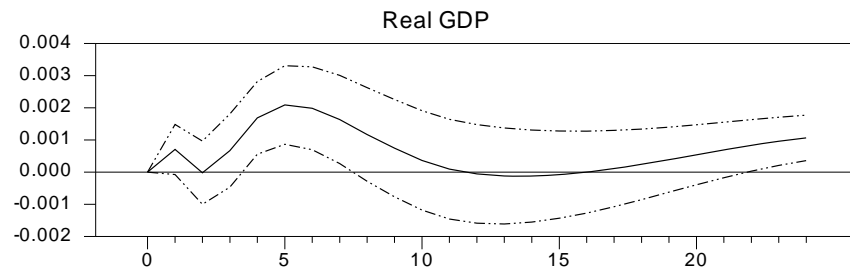
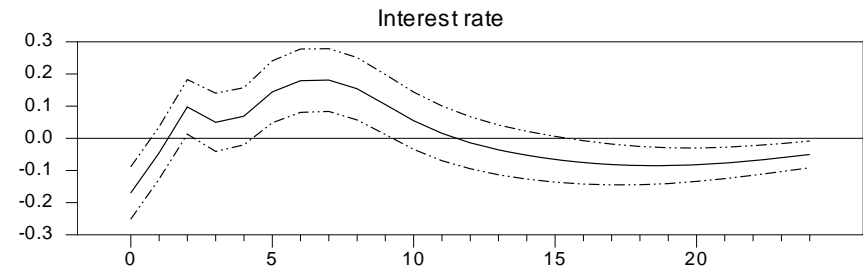
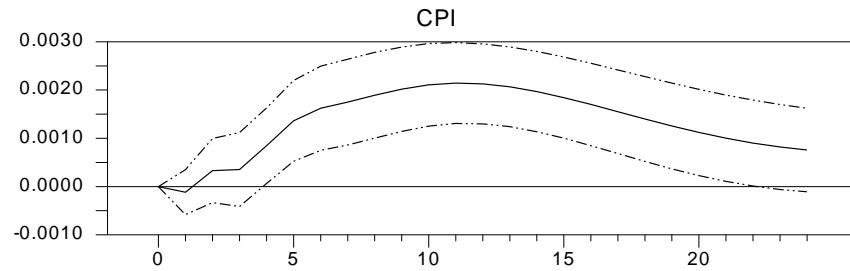
$$P, Y, CR \rightarrow R \rightarrow HP, SP$$

- Results insensitive to identification scheme.
 - Highest correlation 0.39 (between CPI, HP).
 - G&H (2008) do NOT interpret results as structural.
- Do NOT seek to identify AS & AD shocks.

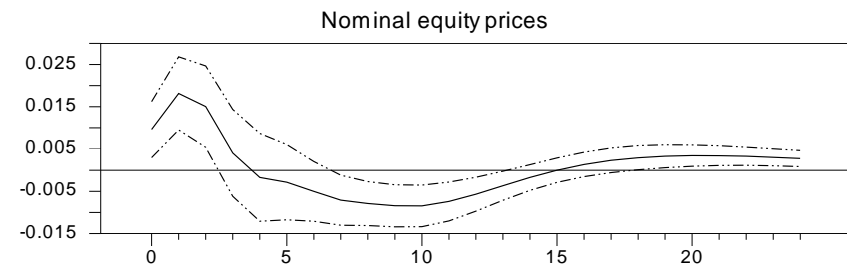
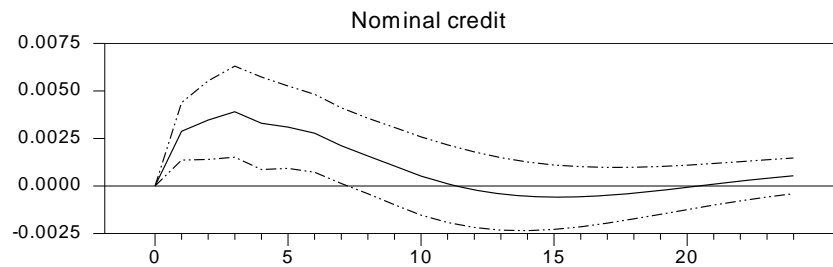
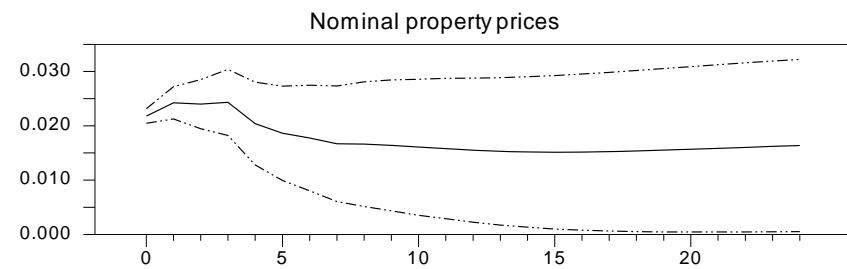
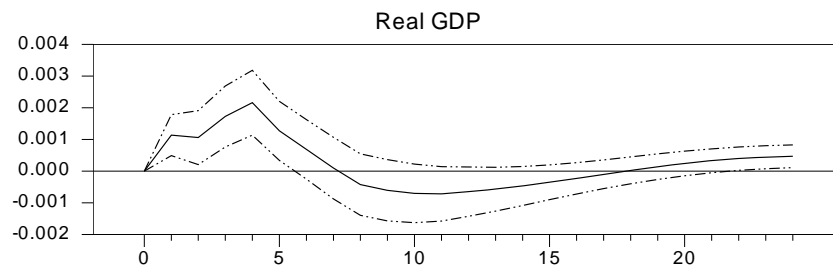
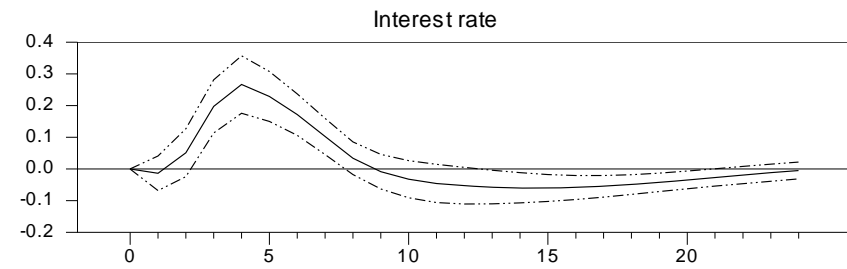
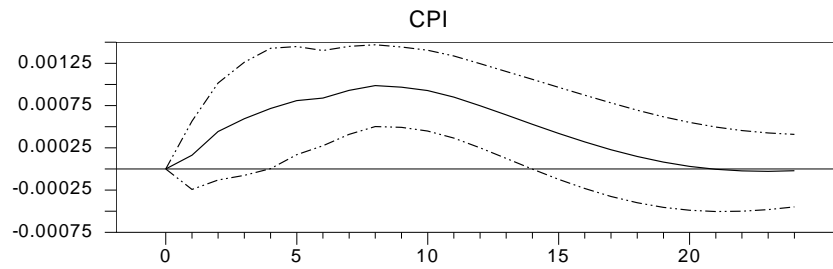
Monetary Policy Shocks (± 2 SE)



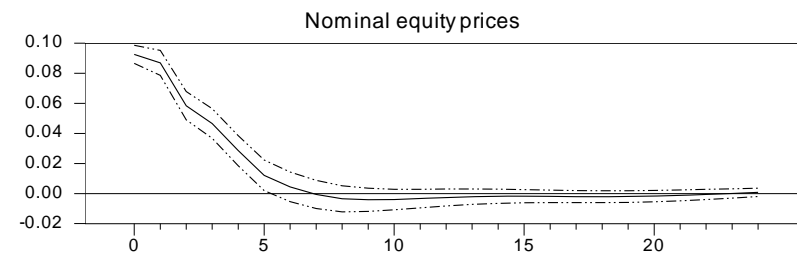
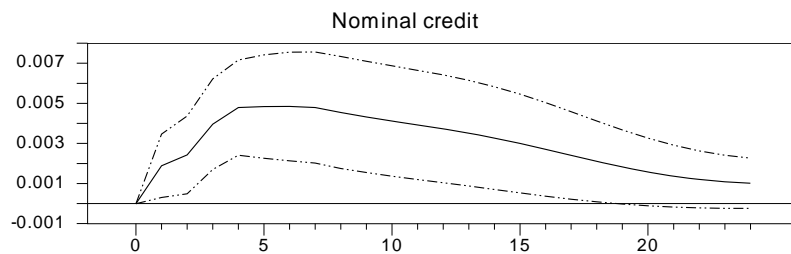
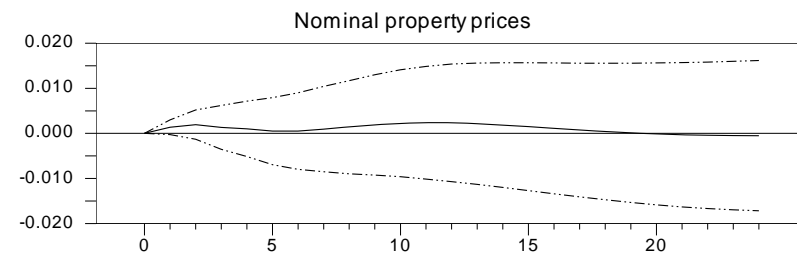
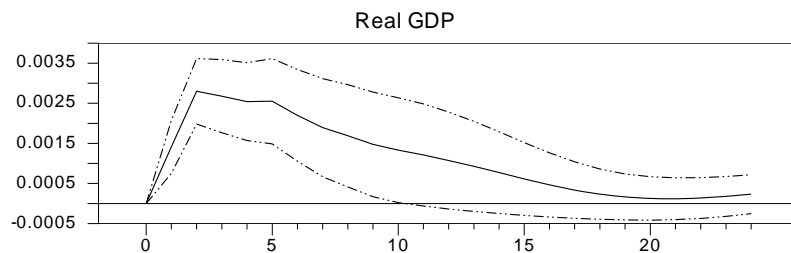
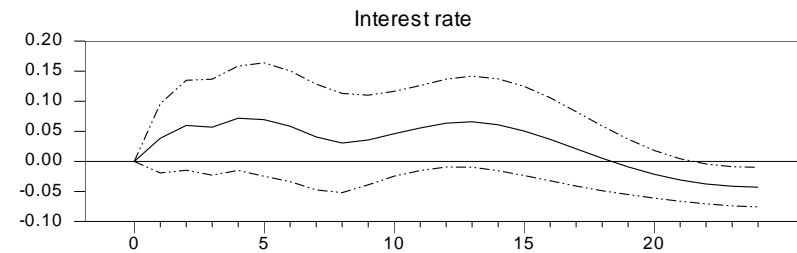
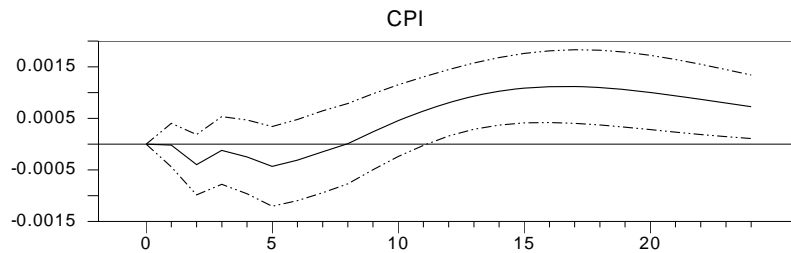
Credit Shocks (± 2 SE)



Property Price Shocks (± 2 SE)



Equity Price Shocks (± 2 SE)



Some Conclusions

Monetary policy has “large” effects on Y , relative to those on AP .

Credit shocks impact on P & Y but not on HP .

AP shocks impact on P , Y & CR .

Implications for MP ?

Large output losses from *leaning-against-the-wind*?

CBs reacting to P & Y will respond to CR & AP shocks.

Does CR contains marginal information for HP ?

II. Multi-Country VAR

How do US shocks spread internationally?

Highly preliminary!

Use a multi-country VAR.

Traditional VAR overparametrized.

Canova and Ciccarelli (2006).

Let Y_{nt} include all variables for all countries.

$$y_{n,t} = \mu_n + A_n(L)Y_{n,t-1} + \varepsilon_{n,t}$$

$$Y_{n,t} = (y'_{1,t}, y'_{2,t}, \dots, y'_{N,t})$$

$$y_{n,t} = (p_{n,t}, y_{n,t}, cr_{n,t}, i_{n,t}, \Delta hp_{n,t}, sp_{n,t})$$

VAR with 17 countries and 6 variables \Rightarrow 7140 coefficients.

Not estimable without restrictions.

C&C's idea is to summarize the information in the data using linear combinations of the data.

Intuitively, imposes restrictions on VAR parameters.

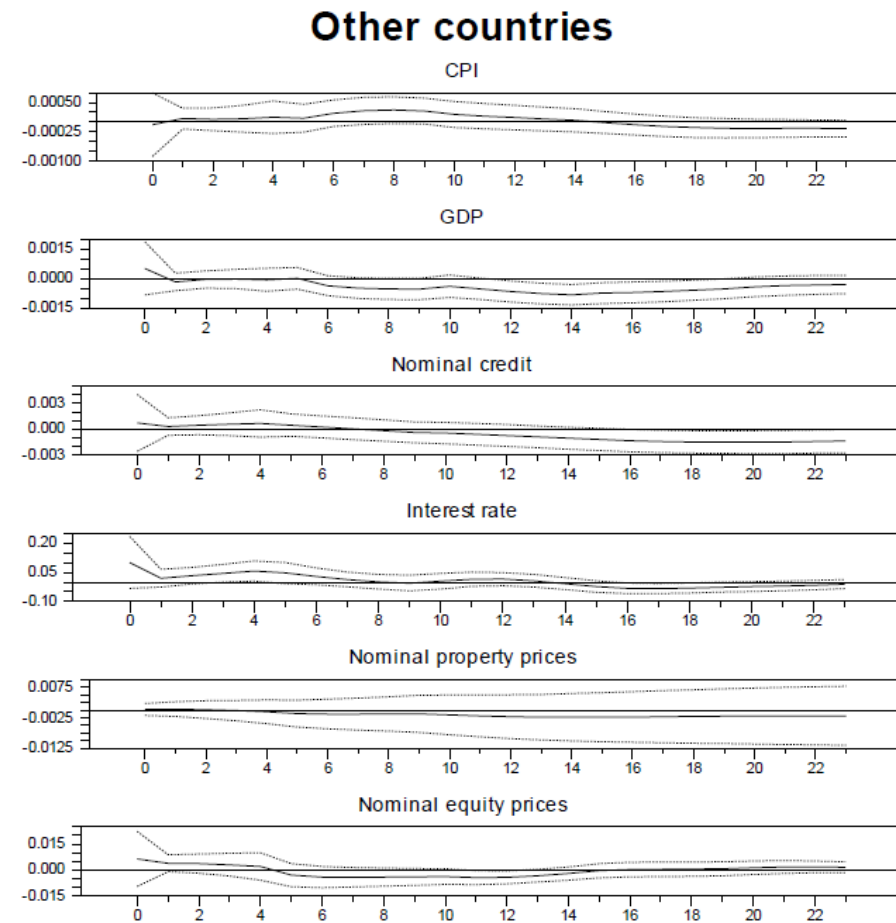
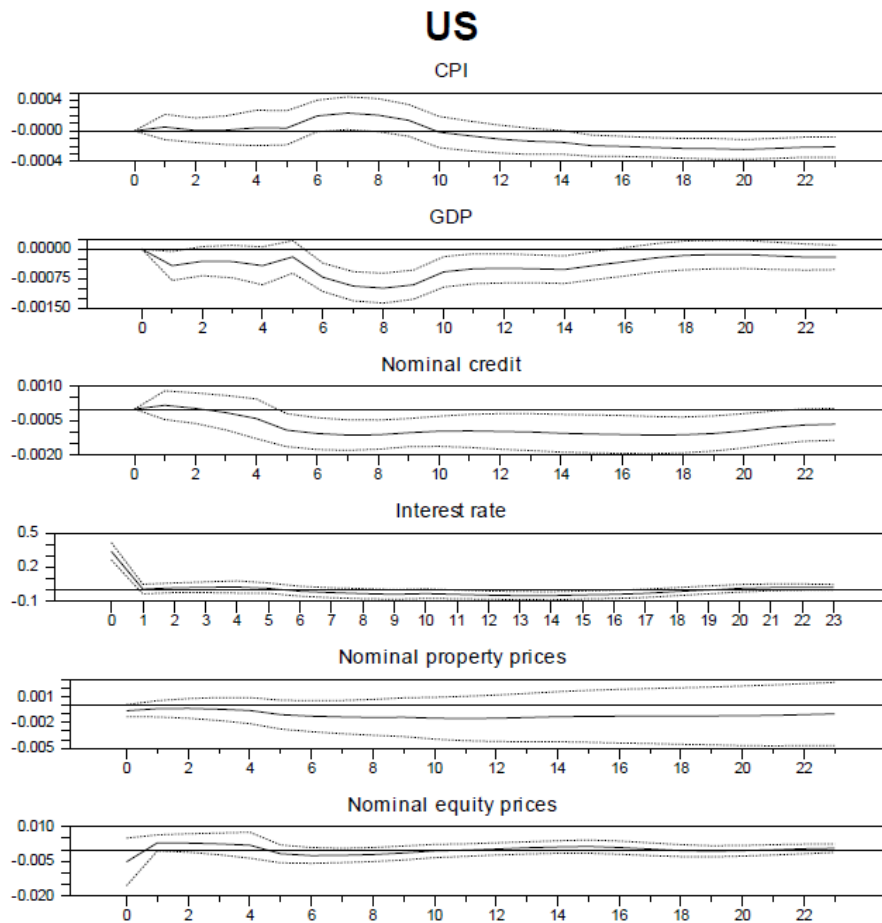
VAR parameters, δ , can be factored:

$$\delta = \sum_{f=1}^F \Xi_f \theta_f + u$$

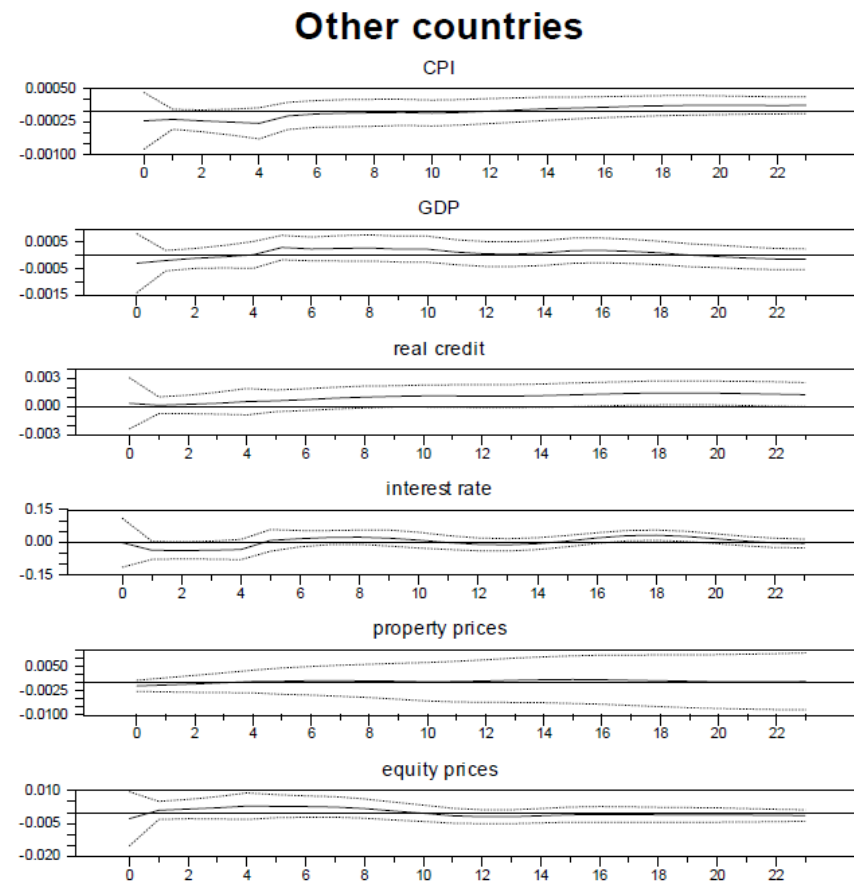
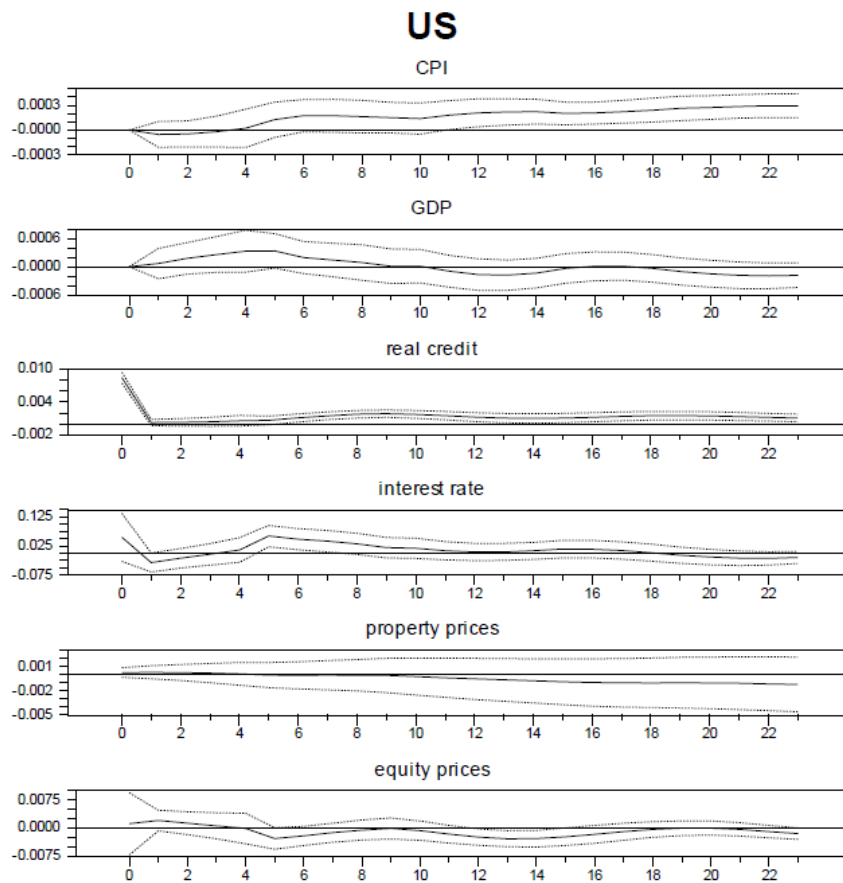
We let θ have a common, country-specific, variable-specific and lag-specific parts.

Estimate θ using a linear transformation of the data, $X\Xi$.

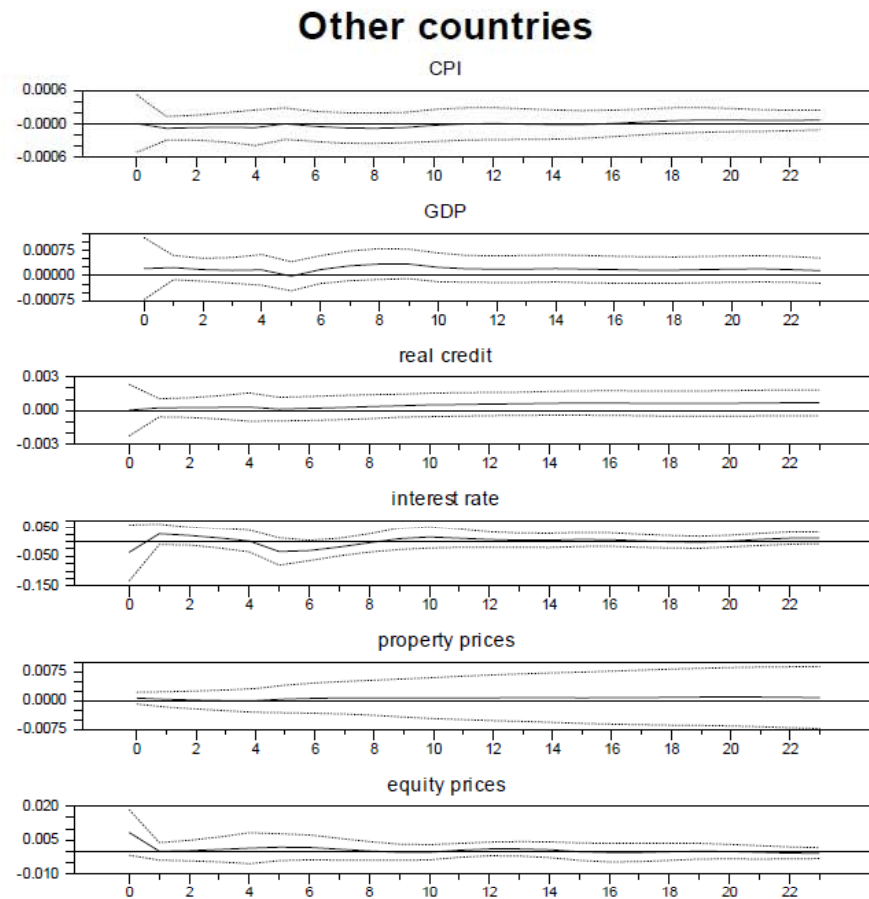
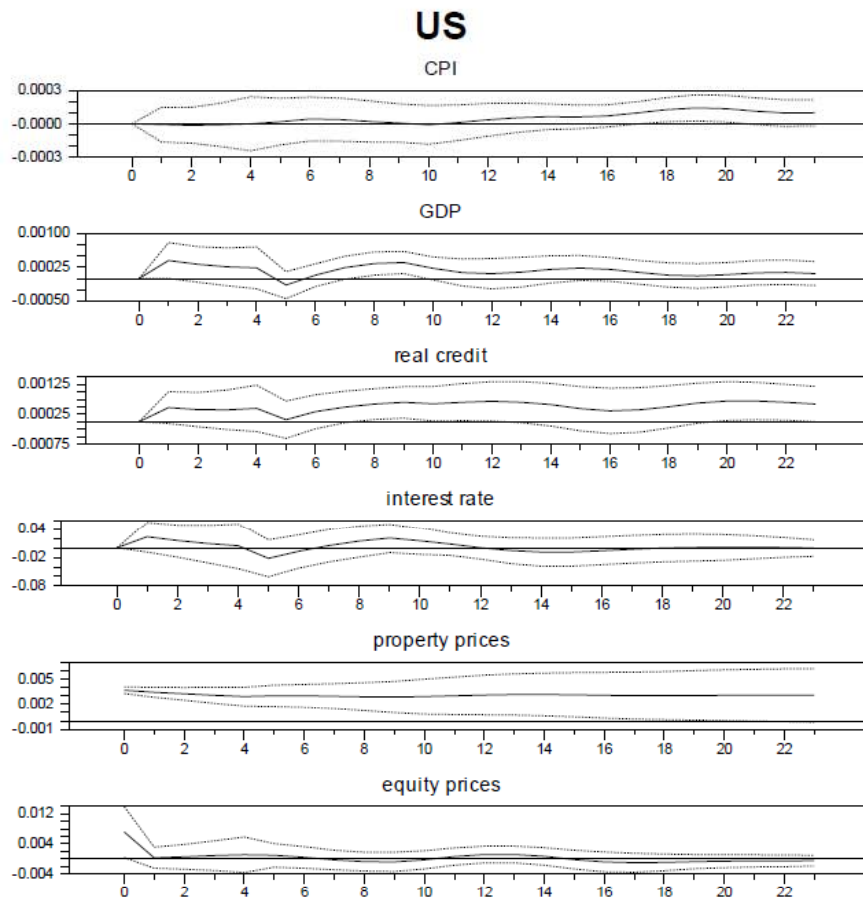
US Monetary Policy Shocks (± 1 SE)



US Credit Shocks (± 1 SE)



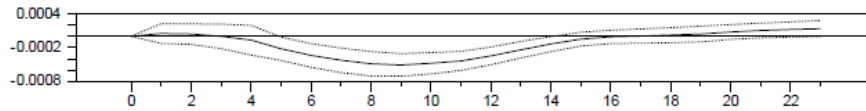
US Property Price Shocks (± 1 SE)



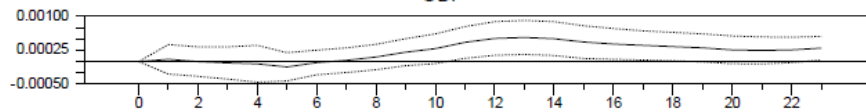
US Equity Price Shocks (± 1 SE)

US

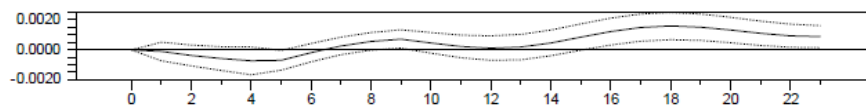
CPI



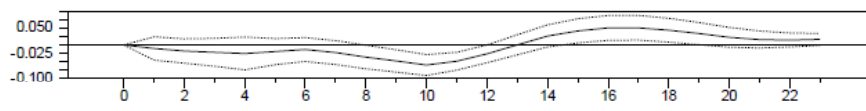
GDP



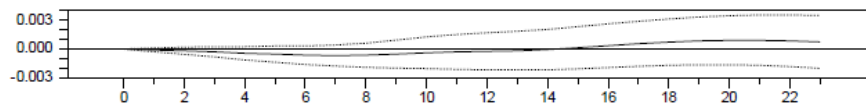
real credit



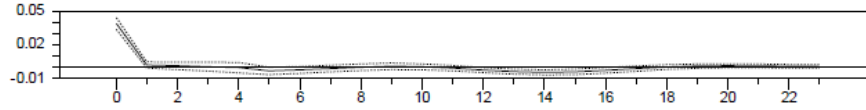
interest rate



property prices

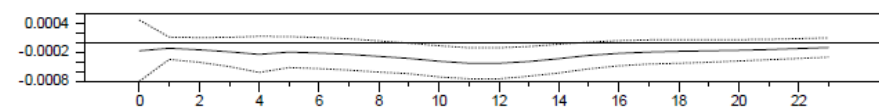


equity prices

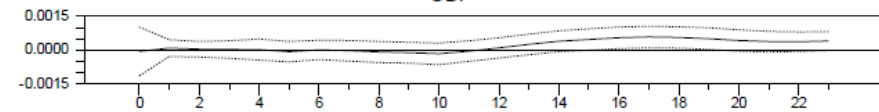


Other countries

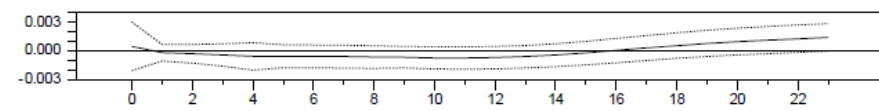
CPI



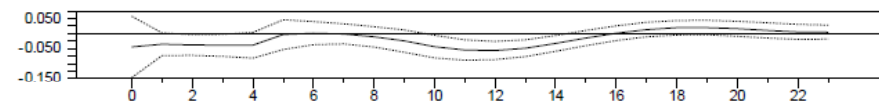
GDP



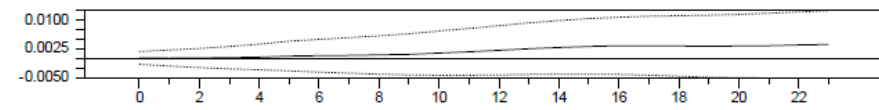
real credit



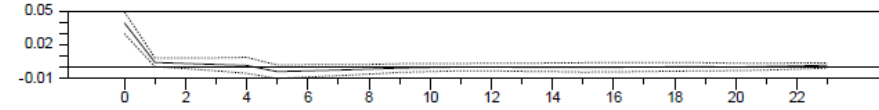
interest rate



property prices



equity prices



Limited transmission (?).

Potential explanations:

Correlation between US and other countries may be due to AS and AD shocks in the US.

Need to identify these.

These effects could depend on the state of economy.

Allow for non-linearities.

May have become more important over time.

Conclusions

PVAR system:

Reproduce the standard findings regarding MTM.

Credit matters ... but not for property prices.

AP matter:

Raise GDP and interest rates after 3 – 4 quarters.

Raise prices after 8 quarter.

Responding to P, Y may be enough (?).

Multi-country VAR:

Some transmission but less than expected (?).