



EUROPEAN CENTRAL BANK

EUROSYSTEM

The risk management approach to macro-prudential policy

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Stress Testing Conference

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The views expressed are my own and do not necessarily reflect those of the ECB



Our story

1. Macro-prudential policy as an exercise of risk management

Trade-off between downside risks and upside potential

2. Quantify the stance of macro-prudential policy

- Use a loss function
- Move from crisis prediction to stress scenario analysis

3. Need a macro-econometric model

- Real and financial variables are endogenous
- Tail interactions matter, not only averages

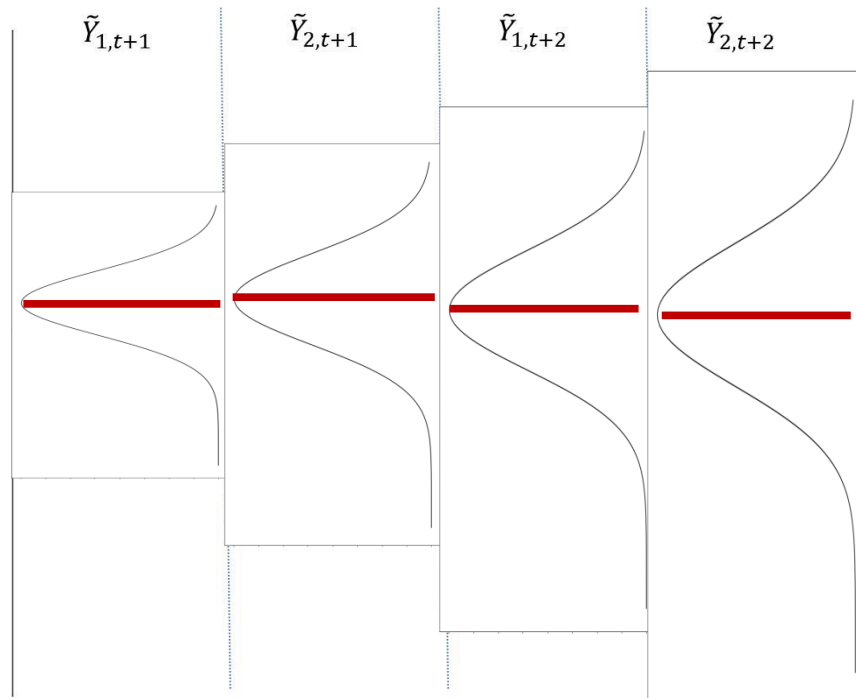
Overview

- 1 The QVAR model – Graphical econometrics...**
- 2 Implementing the macro-prudential risk management approach

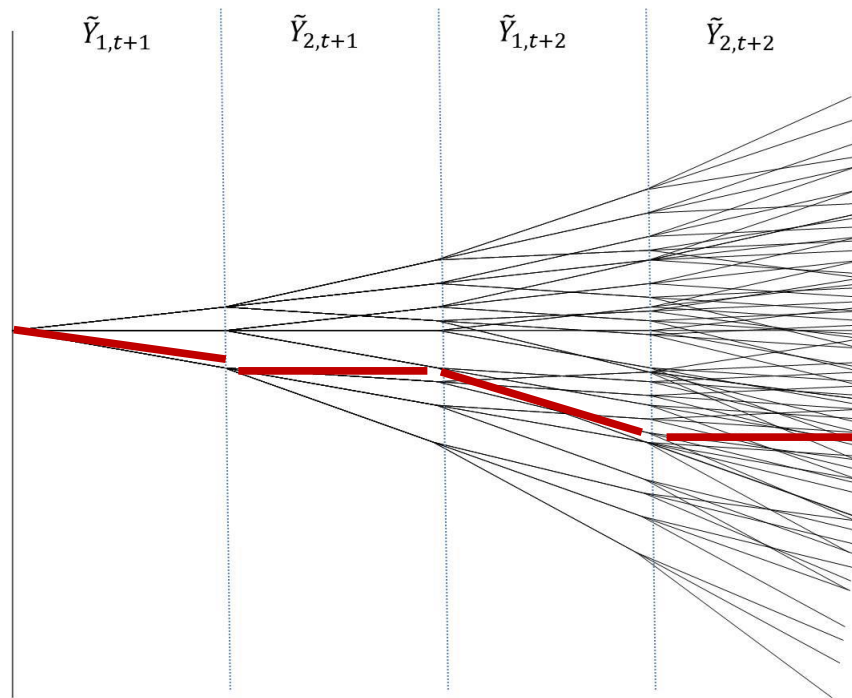
VAR vs QVAR

- If homoscedastic, the two are (asymptotically) equivalent
- Strong evidence of asymmetric macro-financial linkages
 - VAR under-estimates downside risks
 - VAR over-estimates upside potential

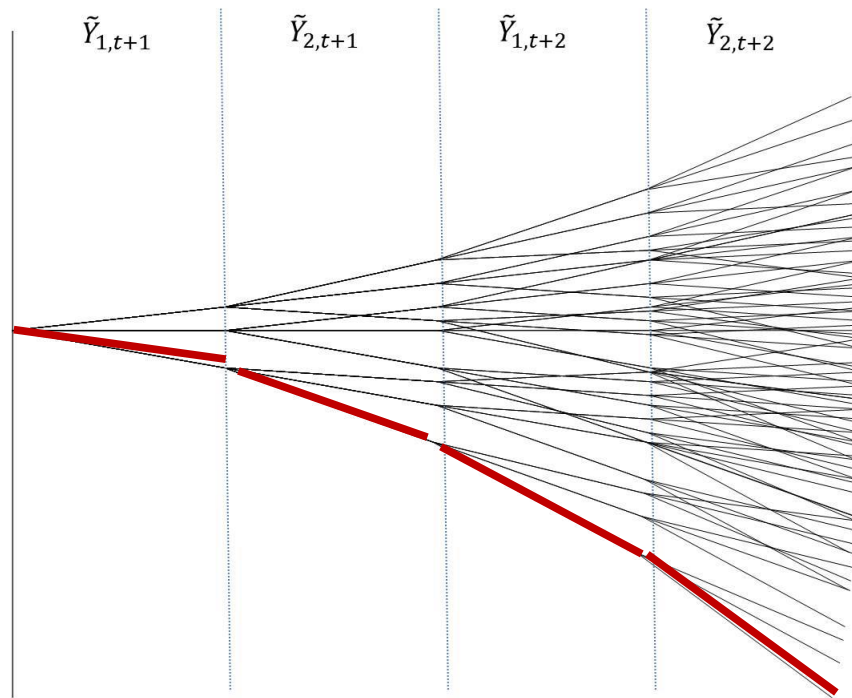
The VAR model



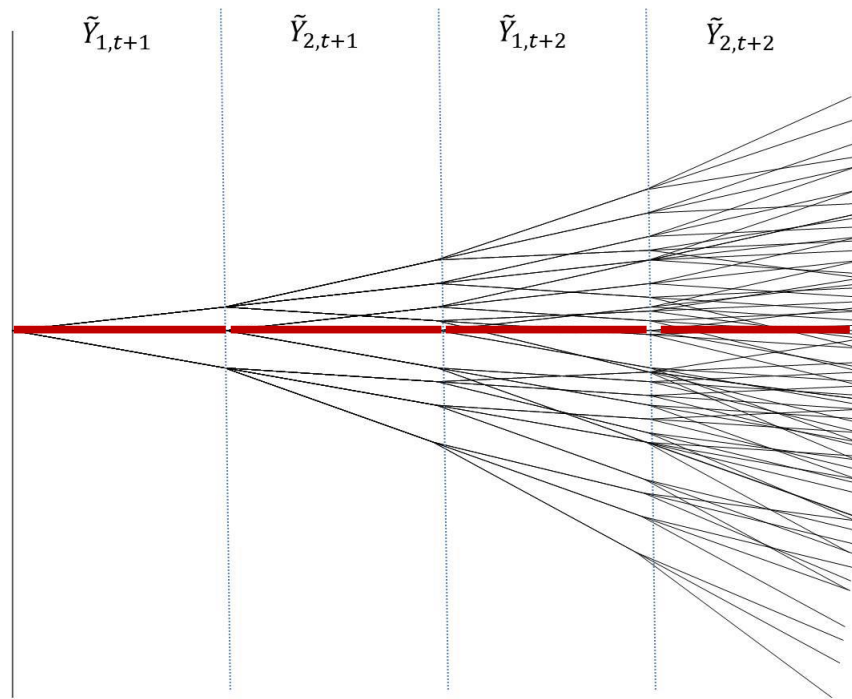
The Quantile VAR model



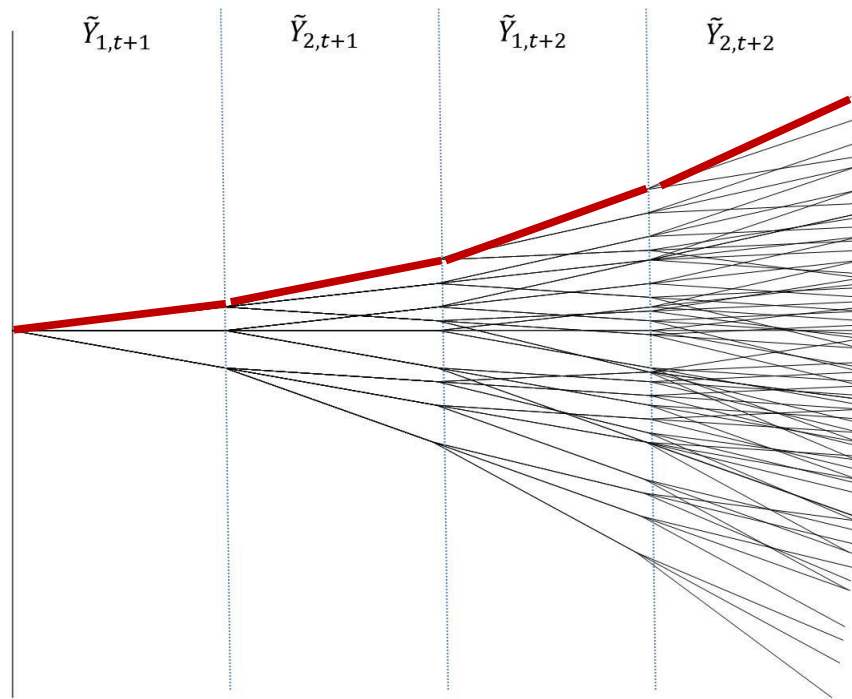
The QVAR model – Or...



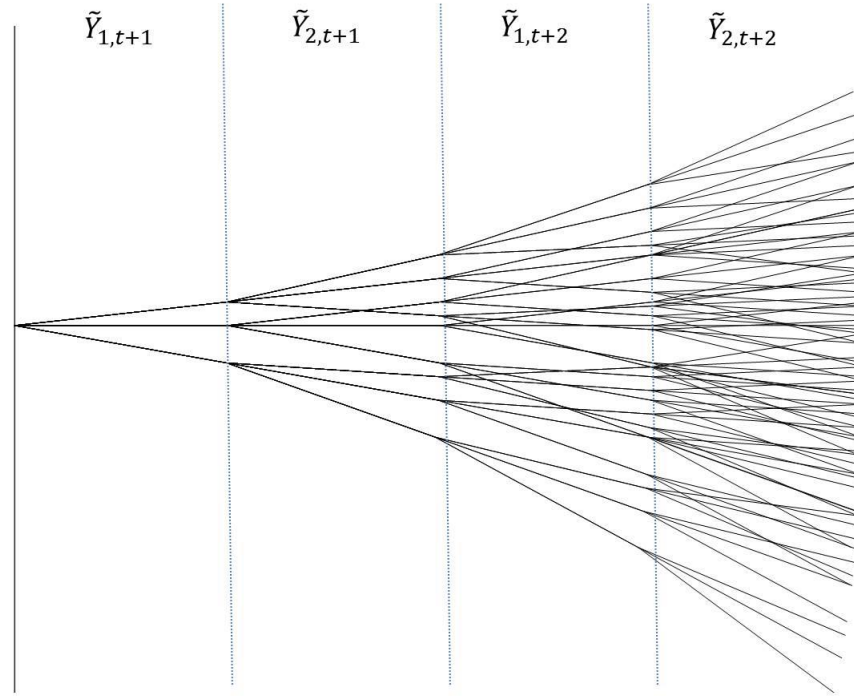
The QVAR model – Or...



The QVAR model – Or...



The QVAR model – Or any other path



Overview

- 1 The QVAR model – Graphical econometrics...
- 2 **Implementing the macro-prudential risk management approach**

2. Implementing the macro-prudential risk management approach

- a. Estimates of QVAR**
- b. Towards a macro-prudential stance**

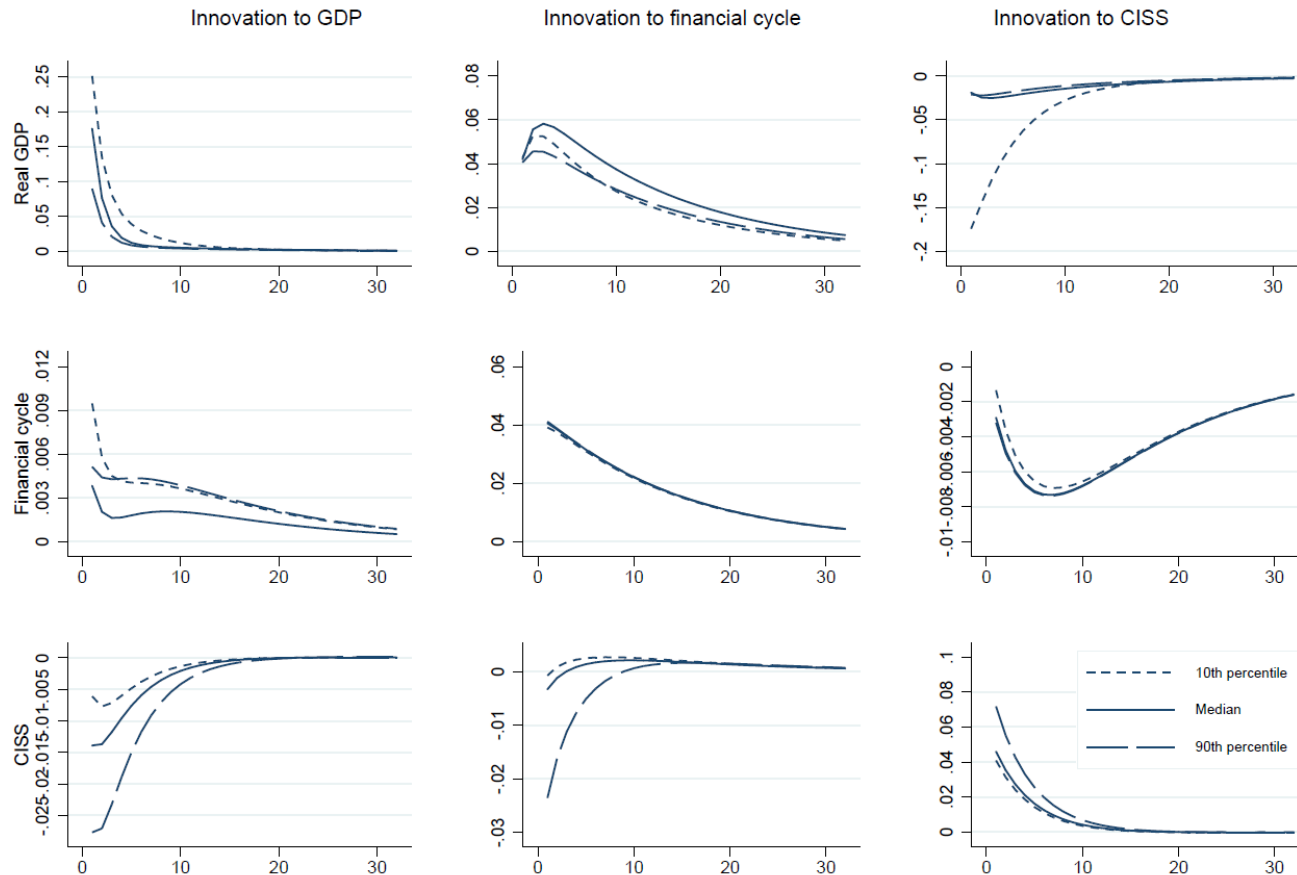
The QVAR model

$$x_{t+1} = \omega + A_0 x_{t+1} + A_1 x_t + \epsilon_{t+1}$$

$$x_{t+1} = [\text{GDP, Financial Cycle, CISS}]'$$

Euro area: 1988Q3 – 2018Q4

Asymmetries in the quantile IRFs



2. Implementing the macro-prudential risk management approach

- a. Estimates of QVAR
- b. Towards a macro-prudential stance**

A thought experiment

		Normal times	Crisis times
		t+1 ... t+6	t+7 ... t+12
Passive policy	GDP		
	Financial cycle		
	CISS		90%
Active policy	GDP		
	Financial cycle		
	CISS		90%

A thought experiment

		Normal times	Crisis times
		t+1 ... t+6	t+7 ... t+12
Passive policy	GDP		
	Financial cycle	60%	10%
	CISS		90%
Active policy	GDP		
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A thought experiment

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Towards a macro-prudential policy stance

Each policy is evaluated as:

$$u = \sum_t E_t(GDP) + 0.5 \int_{-\infty}^0 GDP dF_t(GDP)$$

Towards a macro-prudential policy stance

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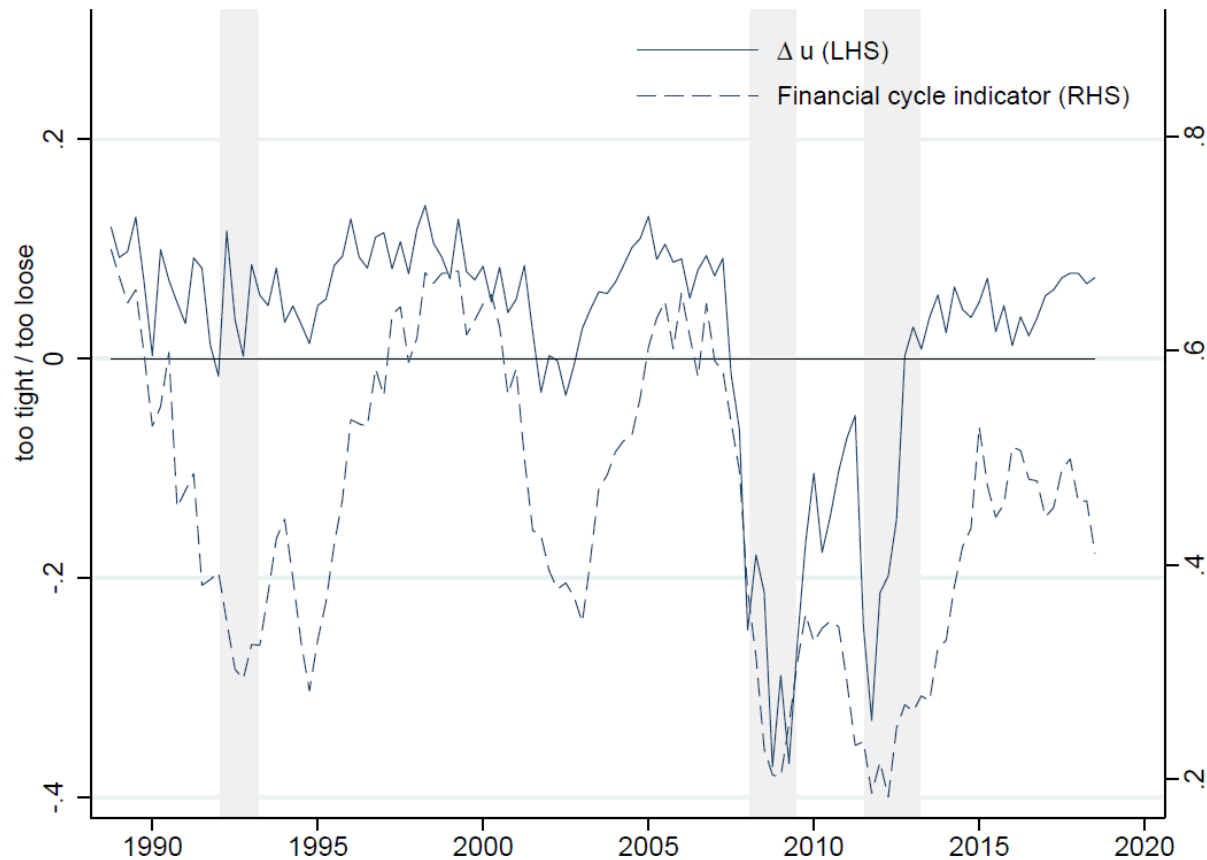
$$u = \sum_t E_t(GDP) + 0.5 \int_{-\infty}^0 GDP dF_t(GDP)$$

Report:

$$\Delta u = u(\text{active}) - u(\text{passive})$$

- If $\Delta u > 0$ active policy is preferred to passive
- If $\Delta u < 0$ passive policy is preferred to active

Benefits from active macro-prudential policy



Conclusion

1. Macro-prudential policy as an exercise of risk management
Trade-off between downside risks and upside potential
2. Need for econometric models
Macro-financial asymmetries
3. Move away from predicting crisis, towards stress scenario
4. Use decision function to quantify the benefits of policy

Annex

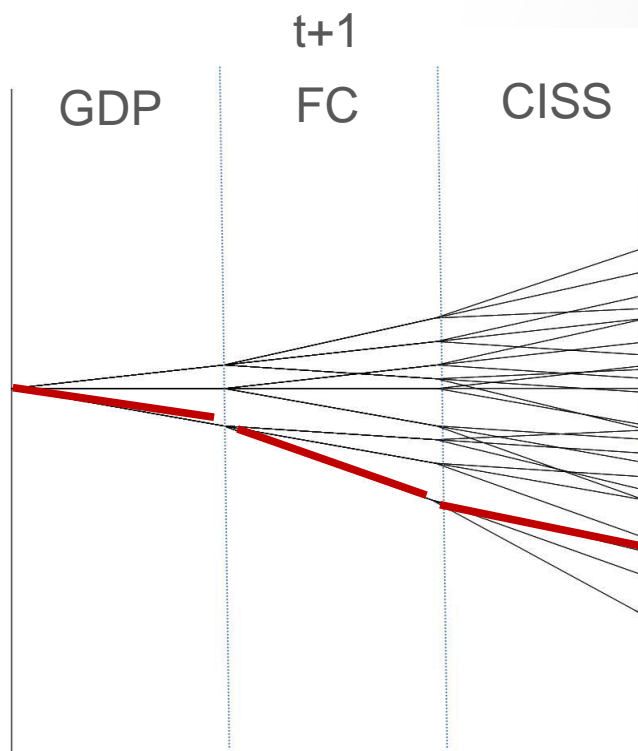
5. Implementing the macro-prudential risk management approach

- a. Estimates of QVAR
- b. Growth shortfall and longrise
- c. Stress testing the euro area economy**
- d. Towards a macro-prudential stance

Model-based stress testing

Forecast of GDP, subject to a sequence of tail shocks.

GFC stress scenario



- Choose the quantile probabilities to match 2009 Q2 GDP contraction four quarters ahead
- Apply these quantile probabilities at each point in time

Vulnerability to GFC-sized shocks

