



Research at the Bank of England

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Who we are: Bank of England

The Bank's mission is to promote the good of the people of the United Kingdom by maintaining **monetary** and **financial stability**.

I am the head of the **Stress Testing Strategy Division** within financial stability.

Lots of impetus towards financial stability research:

- Financial crisis revealed gaps in our knowledge
- Financial Policy Committee created in 2013
- Many relatively unexplored questions



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Who we are: Stress Testing

What do we do:

- Top down stress testing of the biggest UK banks
- 2014: first UK concurrent stress test
- Today: building models that capture feedbacks and amplification



Research staff:

- 6 PhD researchers/modellers
- 1 research consultant
- 2 academic visitors



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Being a researcher at the Bank of England

- 'In between the private sector and academia'
- 50% time on research and 50% on policy
- Policy work normally related to research expertise
- Insights from policy can enhance research relevance
- Work in teams/collaborative environment
- PhD internships or external collaborations common



How we work

Research:

- Aim for journal publications
- We have data and can request more!
- Intelligence from people working in the industry helps in picking what is relevant

Policy:

- Apply your research – e.g. use your model
- Knowledge of research used to inform policy decisions

Can catch two birds with one stone!

Example: your research is used to build models which are used to set banks' capital requirements, and the insight gained in building models make your research less abstract.



How we work

Cross-fertilisation between research and modelling is **challenging**, and not always possible...

For research projects that

- Are important beyond the activity of a division
- Have a wider scope

We have the **Research Hub**:

- Ring-fenced time
- Network with other researchers
- Opportunity to work on broader topics

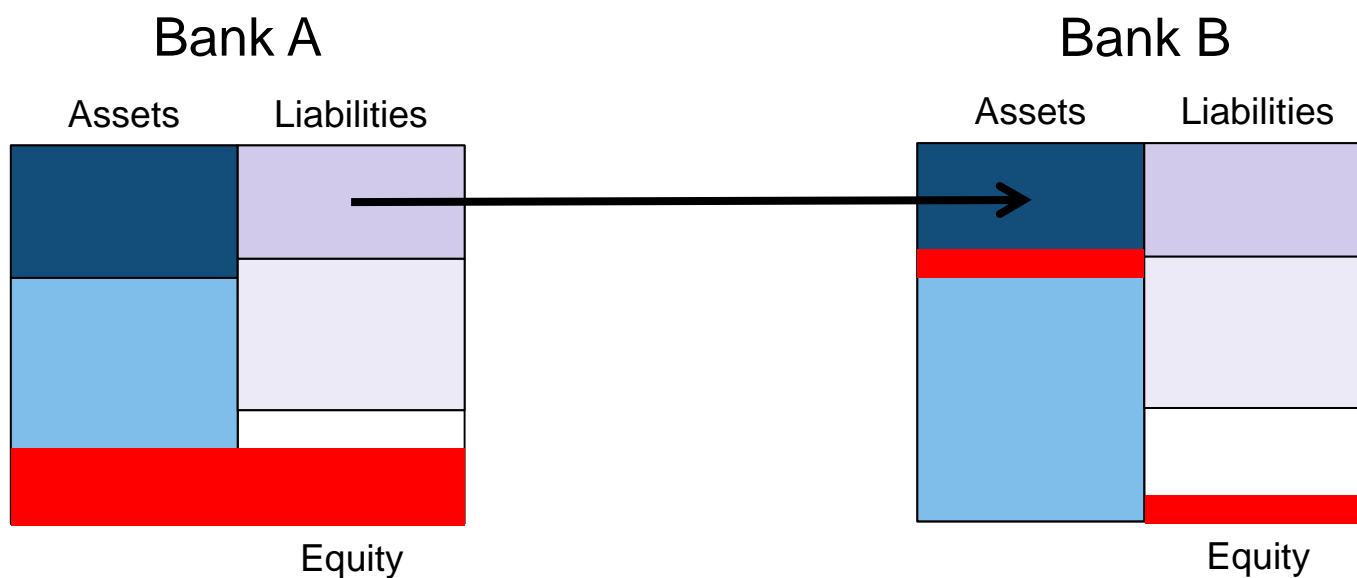


Selected recent research output

- Bardoscia, Barucca, Brinley Codd and Hill (2017): [The decline of solvency contagion risk](#), Bank of England Staff Working Paper (Forthcoming)
- Polanski and Stoja (2017): [Forecasting multidimensional tail risk at short and long horizons](#), Bank of England Staff Working Paper 660
- Eccles and Wegner (2017): [Scalable games: modelling games of incomplete information](#), Bank of England Staff Working Paper 641
- Harris, Nguyen and Stoja (2017): [Systematic tail risk](#), Bank of England Staff Working Paper 637
- Chavaz and Rose (2016): [Political borders and bank lending in post-crisis America](#), Bank of England Staff Working Paper 629
- Hacioglu Hoke and Tuzcuoglu (2016): [Interpreting the latent dynamic factors by threshold FAVAR model](#), Bank of England Staff Working Paper 622
- Baptista, Farmer, Hinterschweiger, Low, Tang and Uluc (2016): [Macroprudential policy in an agent-based model of the UK housing market](#), Bank of England Staff Working Paper 619



Solvency contagion: Research



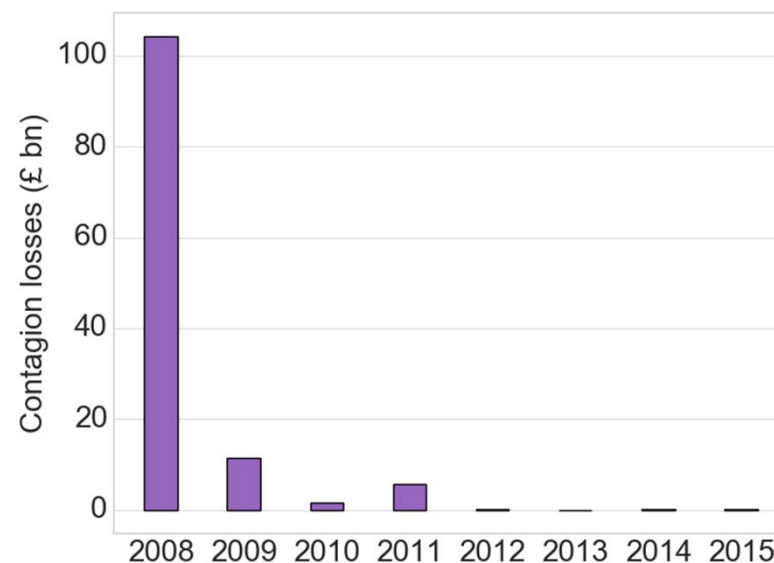
Few default cascades, even in the crisis: Contagion spreads before defaults occur - consider Credit Valuation Adjustments (CVA)



Solvency contagion: Research

Main results:

- Risks drop sharply from the crisis
- Capital increase and drop in exposures play a crucial role
- Distribution of capital matters!



Check the Staff Working Paper: Bardoscia et al (2017), which will be available shortly with the code!



Solvency contagion: Policy

- We used the model for the **first time** in the 2017 stress test
- Now stress test results account for this contagion channel
- The effect is **small** right now, but now we have a tool and a data collection to **monitor** it
- We plan to integrate it with **other channels of contagion** as well (fire sales, ...)



How do we use models in stress tests?

- Stresses are inherently difficult to model
 - Less focus on DSGE and historical relationships
 - More emphasis on nonlinearities and non-equilibrium models
- Modular approach – changed since pre-crisis
 - Suite of models
 - Plurality of views
 - Not used as a black box
 - Used to inform judgements by policymakers
- Leverage off research community: Policy and models go hand in hand



How do we implement a model?

- Find the most appropriate data, or request it from banks
 - E.g. granular data on securities and exposures
- Calibrate key parameters to UK system
 - Constraints on banks
 - Behaviour and decision making
 - Market depth / price impact
- Linking to the process
 - What is included in banks' projections?
 - What extra adjustments are necessary?



Improving the qualitative review: Policy

What it is:

- Part of stress test each year to measure banks' improvements in risk modelling, scenario expansion, cooperation with Central Bank, etc.

What we did:

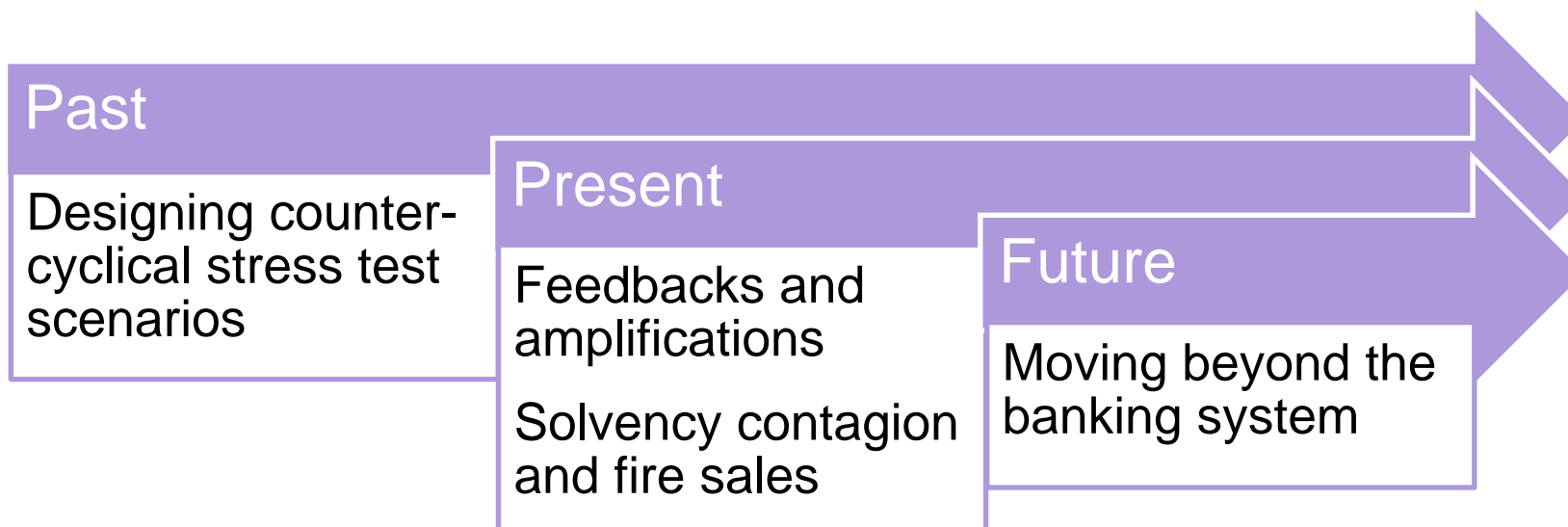
- Developed a new approach to compare banks against each other and against previous years
- Introduced meetings with senior officials to gauge level of engagement
- Proposed new visualization techniques for results

Why our expertise was relevant:

- Knowledge of incentive literature (moral hazard etc.)
- Different way of thinking: Looking at the problem from the banks' perspective



Where are we?

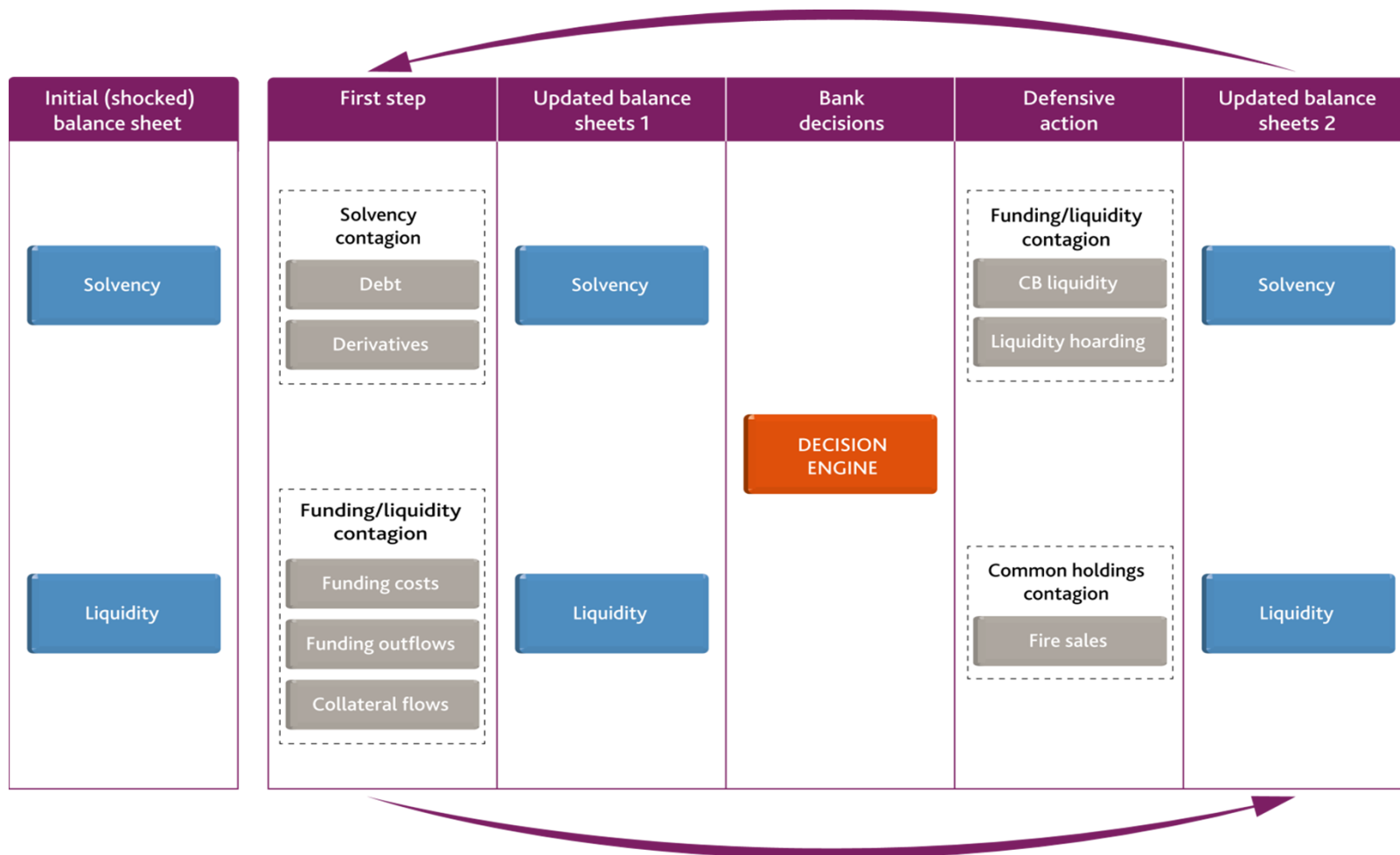


Current challenge: Feedbacks and amplifications

- Link mechanisms in a single framework:
 Feedback Loops and Amplification Mechanisms Engine
- Separate out:
 - Impact on banks balance sheet
 - Impact of banks' actions
- Draw out banks' options and decisions



Current challenge: Feedbacks and amplifications



What about disclosure of stress test results?

- Tool to boost confidence in financial markets
 - But: could cause bank runs and as a result may reduce risk sharing opportunities (Goldstein and Leitner 2015)
- Establish higher levels of confidence in financial markets - Bayesian persuasion (Williams 2015)
- Align perceived risk and actual risk (Danielsson 2016)
- More transparency, reduced information asymmetries
- More market discipline
 - But want to avoid model monoculture



Challenges in Stress Testing

- Internal model development (Leitner and Yilmaz 2016)
- Principal-Agent conflict related to banks' modelling results
- Optimal stress test design (Williams 2015)
- Disclosure and financial stability (Goldstein and Sapra 2014)
- War time and Peace time stress testing (Schuermann 2016)
- Implications for competition (i.e. coverage and quality certification, facilitating collusion)
- Using a larger number of scenarios
- Moving beyond the banking system and moving beyond borders



Other research topics at the Bank of England

1. Policy frameworks and the interactions
2. Evaluating regulation, resolution and market structures
3. Policy implementation
4. New data, methodologies and approaches
5. Response to fundamental change

For more detailed info see [One Bank Research Agenda](#) on our website

