FINAL REPORT ON CIFR FUNDED RESEARCH PROJECT

This report must accompany the final output of your CIFR funded research. Please email an electronic copy to CIFR at research@cifr.edu.au   In your final output please include a section highlighting the policy implications and relevance of your research. Areas requiring further research should be noted where appropriate.

1. PROJECT DETAILS

1. Project title and CIFR tracking number

T014 -Quantifying the impact of systemic risk on capital requirements for interrelated financial institutions and sectors.

2. Project leader

Name	Piet de Jong, Macquarie University

2. FINDINGS

Abstract:

SRISK methodology recently proposed in the literature is refined and extended. The refinement is to define systemic risk using a formalised stress testing framework including a stress function and associated measures of baseline risk and stress risk (called psi-risk). Baseline risk and the stress risk are in terms of the ordinary and stressed expectation, respectively. Stressed expectation is expectation computed under a hypothetical stress, modelled with the stress function. Systemic stress is defined in terms of stress impacting on a number of firms or financial entities. Stress functions are chosen by the practitioner typically exaggerate undesirable extreme outcomes. Properties and characterisations of stress and stress related quantities are displayed and explored.

Concepts, measures and tools are applied to publicly available daily Australian bank data to monitor, in real time, stress positions and bank and banking system stability. It is proposed tools be implemented for real time monitoring of bank stress.

3. SIGNIFICANCE OF FINDINGS

Summarise the significance of your research findings to the Australian financial industry.

Your summary will be featured on the CIFR website and in CIFR publications, and may form the basis of an article for publication in industry media. Please keep in mind this audience when writing the summary. (600 - 800 words)

The significance of this research is in the development and application to Australian bank data of a new tool to monitor and predict financial distress in financial institutions.

The tool refines and extends the SRISK methodology recently proposed in the literature. Forecasts of capital shortfall are made on the basis of daily time series models capturing changing volatilities and correlations. Real time monthly forecast outputs from these models are stressed using a formal and consistent stress testing framework developed in the paper. Calculations performed on Australian bank data are shown to predict past distresses. Systemic risk is shown to be driven by the size and leverage of balance sheets and interdependence between firms. Firm balance sheets are modelled using publicly available information and assumed to depend on market returns. Modelling refinements with the availability of more comprehensive information and practical implementation details are also discussed.

4. IMPLICATIONS OF YOUR RESEARCH

What is the relevance of your research to regulators/industry? (200 – 300 words)

The proposed tool is practical and useful for the real time monitoring and forecasting of stress in individual financial institutions and the financial system as a whole.   The tool is extensible to situations where more detailed balance sheet information is available. The tool organises information in a formal and consistent manner and hence imposes a detailed discipline on stress testing procedures and the interpretation of output from the same.

STAKEHOLDER ENGAGEMENT

5.1 Please list and provide details of the level of engagement:

Organisations	*Level of engagement* (including names of relevant personnel)
APRA	Limited discussion of stress testing procedures. Proposal to offer seminars in the new tool (Mr Charles Littrell) with the view of refining tools to more adequately serve the needs of banks and financial regulators
ASIC	
RBA	
Treasury	
ASX	
ABA	
FSC	
ASFA	
ICA	
AFMA	
ACCC	
Other	

6.   ACADEMIC OUTPUTS

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6.1 Proposed outputs as per original submission

Category	Achieved*	Remarks
A/A* Journal Article modelling and econometric advances	Y/N	*Please see attached. The manuscript (see above) has been submitted and is in the revise/resubmit stage.*
Industry Report	Y/N	*Please see attached*
Presentation of policy implications to APRA and Industry	Y/N	*Please see attached presentation of presentation on the structure and use of the proposed tools*

*If you selected N as an answer, please explain if the output has been replaced or voided in section 9.2 – Project Execution.

Additional output/s to date

N/A

6.2 Please list any additional outputs directly related to this project:

Category	Citation/Details
Book	
Journal article	
Working paper	Has evolved since first iteration into the attached journal submission
Report	
Conference paper	
Conference presentation	
Industry and/or Government Briefings	
Invited Talks	

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Audio/Visual Recordings	
Media Coverage	
Other	

7. RESEARCH TRAINING, CAREERS AND EMPLOYMENT

1. Postgraduate Students

Please provide a list of postgraduate students who worked on this project indicating whether they are PhD, Masters by Coursework or Masters by Research students.

PhD students	**Mr Weihao Choo (recently had his PhD examined and was awarded an outright pass and VC commendation for an exceptional thesis. Will formally graduate at the next graduation ceremony)**
Research Masters students	
Masters students	
Honours students	

2. Early career researchers (with up to 5 years' postdoctoral experience)

Please list any ECRs who participated on this project:

Mr Weihao Choo - FIAA — currently employed at Ernst & Young.

3. Others engaged in the project

Please provide details of any other people involved in the project:

Research associates/assistants funded	none
Professional and/or technical officers	none
Industry partner employees	none

Other personnel involved	none

8. INTERNATIONAL VISITORS AND VISITING FELLOWS ON THE PROJECT

Please list any international visitors /visiting fellows participating in this project, including the name of their university and their position title:

none

9. CHANGES TO THE PROJECT:

9.1 Project team

Were there any changes in your team? (yes/no)

no

If yes, please provide details below:

Researcher's name and organisation	Role	Addition/Deletion

2. Project execution: timing, budget or outputs

Were there any significant changes to the project? (yes/no)

yes

If yes, please provide details below:

An original aim of the project was to collect more extensive and detailed balance sheet information on banks and financial institutions and apply tools in a richer data setting. However we found this inopportune at this stage as a) the tool required extensive and major theoretical development and underpinning and testing and b) the more extensive data would have to be predefined prior to access and there would be no guarantees such data would be accessible or appropriate. Accordingly we put maximum effort into developing the tools and implementing/verify/testing the same on more streamlined data. This focus enabled savings to be made compared to the original budget.

Further we have yet to present the tool at a major international conferences again leading to budget savings. Given the academic paper has now had initial feedback (both from CIFR and journal referees) we are now in a much better position to effectively present ideas for maximum impact — both to theoreticians and applied agencies such as APRA or banks.

The budget savings can be used to further the implementation of the tools in a richer data setting. This assumes APRA or financial institutions will permit effective access to bank balance sheet data. Given our tool is novel, it is appropriate to be implemented in the context of a variety of balance sheet data to see which works best, required further tool modifications and extensions, and detailed interaction with potential users of the tools. Note that pre specification of data by tool developers is not an effective option — effective tool use and development hinges on intimate knowledge of the potentially available data and current tool constraints relative to the available data. Ideally tools are developed in the context of practice and data availability.

In the absence of more extensive accessible data the tool can be applied to the richer data publicly available elsewhere either in Europe or the U.S.

Unfortunately the project leader is now employed 1 day a week (since September 1). Self funded research time above 1 day a week and research expense (including dissemination) is perhaps inappropriate.

3.Researcher feedback

Your feedback on any aspect of CIFR's research process is welcomed:

10. FINANCIAL REPORT

Please provide details of all income received for the project:

INCOME	
Cash contributions from CIFR	
Cash contributions from consortium members (please identify each source separately)	
Cash contributions from other contributors (please identify each source separately)	
Total Income	

In-kind contributions	Consortium members	Other contributors
Staff		
Equipment		
Other		
Total		

Please provide details of all expenditure incurred:

EXPENDITURE	
Salaries	
Equipment	
Travel	
Scholarships	
Other	
Total Expenditure	

11. CERTIFICATION BY PROJECT TEAM LEADER

I certify that:

- all details in this report are true, complete and accurate;

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- all team members participating in the project have agreed that this report is an accurate representation of the project; and

- a copy of this report has been provided to my Dean or Associate Dean, Research.

Signature _____

Print Name _____ Date ___/___/_____