

The Committee welcomes comments on this document from all stakeholders. More specifically, regarding the operational resilience principles, the Committee requests feedback on the following questions:

Q1a. Has the Committee appropriately captured the necessary requirements of an effective operational resilience approach for banks?

Congratulations on producing such an excellent and challenging document. While I agree with much of what is written, it is possible that enhancement-opportunities exist.

The main question is 'Has the Basel 3 approach been successful to date?' This is a difficult question as economies may have been vastly different were it not for Basel 3. Apparently, some countries believe that it has not been beneficial for them and other Regulation-frameworks are being proposed. Resource-rich countries were not performing as well as economies in Governance-rich Europe. I am still very impressed by the Dutch approach to Innovation, Risk Management and Governance.

My international motto is 'Benefits for Australia' and it is possible Basel 3 has yet to deliver such benefits in sufficient quantity. As I wrote in my 2015 Submission, Basel 3 appears to have a strong message for Governance-rich countries.

This splendid document does appear to have a punctuation mark which may be unnecessary and a minor grammar irregularity but I'm sure they have been corrected. I won't provide a review of the accompanying document but I note it may have a typo. It is interesting to see such mistakes in formally produced documents and I can send you an example if required. Writers from pre-computer days may have found it easier to produce error-free documents. A similar comment may also apply to ultra-modern ICT functionality that very large Banks are using. Such functionality may be too complex, slow and / or unstable to provide the required business benefits in a competitive environment. Some Mathematical and Technological questions could be analysed in greater depth.

Compared to a decade ago, ICT is large and complex. Governance standards may have deteriorated in some Resource-rich countries. The term 'Business Benefits' is perhaps not quite as important as the 'staying up to date with technology' approach. It is possible for experts to obtain significant banking benefits just by concentrating on expected benefits.

Banks need to embrace innovation in order to succeed. One recent high-level report from an international agency mentioned the word 'innovation' 49 times without referring to a single example. My Risk Management slogan 'Innovation, ICT Security, ICT Performance and Business Benefits' has recently delivered surprisingly powerful results in recent months.

Q1b. Are there any aspects that the Committee could consider further?

Possibly yes, despite the excellent array of topics covered in this document. The following Infrastructure categories may be applicable, although you have probably covered them.

Infrastructure1: Telecom. In an ICT-world, Banks cannot operate without effective Telecom infrastructure. If a very important Government Telecom 'regulator' is replaced, the new person may

bring new experts with 'better' ideas. This may have a negative effect on Banks and on the entire economy. NB: It appears the Telecom-reset-button has been activated recently.

Infrastructure2: Legal. Banks need a stable Legal environment in which to do business. The brilliant book 1987 'Reform the Law' by M. Kirby expressed concern that A-I microprocessors were becoming too powerful. This prophecy may have been fulfilled and we recently saw one such entity interjecting in a high-profile finance case in Australia. Competing against such ICT-power is perhaps as difficult as playing Chess against the world champion, raising the question 'What is the Law?' I recommend this excellent book. A Mathematical question about legal-history and ICT to a visiting expert reduced him to laughter. Is there a Legal-reset-button?

In very dynamic ICT-environments, evidence can easily be planted or manipulated. Three Australian Banks have recently been questioned about two types of ICT-initiated allegations. The resulting hasty investigations were not done by top-level Mathematicians with Technology expertise and alternative explanations exist that may be more plausible. By contrast, investigations into the 2010 Flash Crash were done by experts and took several years. Would Base 3 recommend such investigations for Banks in resource-rich countries?

Infrastructure3: Mathematical expertise. It is fairly difficult to test new banking functionality that consist of a large number of quasi-independent components. The Chief Financial Officer of a major Australian Bank said (optimistically) after their recent AGM 'It is all so complex you need a PhD to be able to understand it'. Independent Maths experts could assist if required. Some Banks report that it is difficult analyse and manage large, quasi-structured datasets.

NB: As Villani says, 'Mathematique c'est tout' and should perhaps be done by experts.

Infrastructure4: A-I and Definitions. The percentage of banking-experts who query the definitions that vendors use may have declined sharply. It is enormously difficult to test the functionality of such products especially as they may behave quite differently in a production environment. Independent experts may be able to assist in assessing the intelligence-level (IQ?) of such products and in evaluating their effectiveness in production environments. Apparently A-I-computers may find it difficult to predict digits when calculating numbers such as Pi(). They may also find it difficult to predict Weather, Stock Market fluctuations and Investment Techniques that could assist Retail Traders to make a profit. A few years ago, a top-level Mathematician made a scathing comment about weather-predictions in response to a question.

Infrastructure5: Regulators. Regulators in Governance-rich countries receive excellent 'guidance' from organisations such as Basel 3. It is interesting to pose questions about 'Innovation, ICT Security, ...' to local regulators. Does Basel 3 recommend how many Regulator-organisations Resource-rich countries should have along with considerations about their skill-set, governance-expertise and remuneration-levels? Nixon's Checkers speech a few decades ago provides a glimpse into how strictly Remuneration levels used to be determined for Regulators. Do high remuneration levels equate to better regulation or to more irregularities? Mathematics, Technology and Risk Management skills may be very useful tools for legitimate Bank Regulators.

'Shadow' Regulators with no official status may concentrate on emotional issues such as gender, selling-own-products, remuneration and climate change at AGM's. For some Banks and related organisations, little technical information is conveyed during such meetings and pressure may be put on skilful directors to resign. Some non-bank AGMs do not appear to be very professional.

Infrastructure6: Complexity. It may be worthwhile examining a scenario for e.g., House Prices over the past two decades.

- Several decades ago, a person on a basic wage could buy a home and raise a family
- It used to be easy to buy a house in Nederland or Australia
- In 2012, the process required a buyer to sign each page of a 100-page document
- The house-buying process became so complex that A-I simply had to be used
- I recently observed groups displaying their solutions to this complex Banking problem
- At the end of the meeting, I asked about complexity, ICT Security etc
- One group said that buyers did not trust the functionality and would not use it.

Buying a house is a safe transaction for the Bank as the product can usually be repossessed. The process may have become artificially complex in less than two decades. Unfortunately, the proposed solution appears to reflect some of the principles in this Operational Resilience document.

It may be useful to examine ICT Banking statistics as other types of banking transactions may have become artificially complex.

- Several decades ago, all Banking transactions were manual
- With the introduction of ICT, the number of automated Banking transactions rose annually
- Automated share-trading and Bank-to-Bank transactions also increased these numbers
- Tap-and-go functionality provided the next impetus for change
- Initiatives such as a cashless society are providing challenges for Banks in some countries

While each of these initiatives may be excellent, the speed at which they are being introduced leaves little time for Governance standards to be revised. Does Basel 3 have a vision for projected complexity?

Infrastructure7: Climate Change and Natural Disasters. Sydney's weather forecasts during a mild Spring-season were for catastrophic forest-fires and they started a few days afterwards. Many 'experts' claimed that they were caused by Climate Change but this is unlikely as such an event would probably affect the whole world simultaneously. Historical Statistics indicate that about 50% of forest-fires in Australia are deliberately lit. One obvious cause for the severity of the 2020 forest-fires might be that river-water was moved to large dams, resulting in a very hot and dry landscape. The second point-of-interest for this document is that untested communications technology may have contributed to the severity of some forest-fires. Similarly, Banks in some countries may be struggling to reap the promised benefits that new technology has promised - and will eventually deliver.

NB: As definitions are important for aspiring Risk Analysts, it may be worth noting that Floods, which are caused by nature, may require a different Natural Disaster definition to the one used for Forest-fires. Scientific analysis may show that mega Forest-fires are a fairly recent development in Australia's history but massive flooding was a regular occurrence for tens of thousands of years.

Infrastructure8: Outsourcing. If the benefits from banking transactions tend to flow towards large ICT companies, then Banks may need to consider alternative strategies. Are Banks ICT companies that can sell their own products? Are some ICT companies shadow-Banks? Should Banks be able to change their ICT suppliers easily?

Infrastructure9: Specific Risks / ICT Security. Some analysts report that the world may be expecting a repeat of the 1998 Dot.Com bust. If such an event were to follow soon after the disruption that

COVID-19 appears to be causing, then the current Basel 3 proposals may well need adjusting. Whatever the disaster-scenario, it may be important to do the Maths first and the Calculus-type calculations for specific risks afterwards. Some ICT Security arrangements may be complex, expensive and specifically designed for Customers who have no technical expertise. Does Basel 3 provide ICT Security recommendations for a rapidly changing technological environment?

Infrastructure10: ICT Performance. Assuming that Scientists are correctly predicting the impacts of using too much fossil fuel, Banks have the resources to specify how efficient computers could be built and maintained. While off-the-shelf computers are far more efficient than they were a few decades ago, inefficiencies still creep into ICT systems. A client I was working for in Nederland in 1987 was advised to amalgamate two mid-range computers into a much larger one with different software. I did the Maths and one of the mid-range computers was retired two years later. This initiative cost the company nothing but reduced their computing and energy costs. Similar saving-opportunities would exist today, even in Banks. Knuth's estimate that 30% of ICT capacity is used for sorting data (see The Art of Computer Programming) appears to be quite optimistic. Mathematician Roger Penrose also investigated ICT performance in one of his two A-I books. The ICT environment for a major Bank may be far more complex than a game of Chess.

Infrastructure11: Basel-alternatives. One non-Basel approach to Banking Regulation is pondering the question 'Should A-I Bots' be recognised as legal entities? Firstly, no machine that I have seen would ever meet the intelligence requirements. Secondly, A-I bots do not support the local economy by buying coffee or supporting political initiatives. Thirdly, consistency is a more serious issue. A given A-I Bot (Tom) may be an ideal citizen for the first few weeks after it rolls off the production line. Then a human being or another A-I bot might type an extra line of code into Tom's control dataset and completely change the way Tom operates. While enhanced-Tom might make better (or worse) Operational Resilience decisions for their Bank, it might not be the same entity that was determined to be a legal entity.

Infrastructure12: Basel-effectiveness. The Australian economy has not been particularly successful since 2015, ignoring COVID-19 for the moment. We have exported c.q. destroyed vast amounts of natural resources and cultural sites that record human history for tens of thousands of years. It may be worth noting that Governance-rich countries are restoring their ancient monuments.

Australian Banks and related organisations such as Super Funds and Telecoms are not well regarded at home. More expensive Telecom-imports usually promise to rectify the situation. One major Australian Resources company was repeatedly fined large sums of money for health-related events. After the company relocated to Europe, both the fines and the health-issues disappeared. Does Basel 3 merely provide advice or does it support the reputation of excellent and ethical Banks in Resource-rich countries?

Q2. Do you have any comments on the individual principles and supporting commentary? Yes.

It may be possible to make comments throughout the whole document. Perhaps you might ask in-house technocrats from several Banks for technical feedback. As analysis by Technology might produce some interesting results.

Q3. Are there any specific lessons resulting from the Covid-19 pandemic, including relevant containment measures, that the proposed principles for operational resilience should reflect?
Certainly.

COVID-19 may be a specifically human-related virus event. A fair percentage of Banks' issues are ICT-related virus events but COVID-19 may have impacted their profitability. The well-documented history of human-virus-related events shows that some such illnesses occur naturally while others are deliberately inflicted on targeted groups of people. The appropriate response may sometimes depend on how the virus originated.

Maths Risk Analysis spotted a weakness (acknowledged) in the 2009 Swine Flu analysis and may have highlighted a weakness with the COVID-19 virus. Maths and Science may show how to minimise the probability of infection and how to maximise economic-recovery speed.

For COVID-19, some of the pre-published 'Maths' was contradictory (e.g. a 'Herd' vs a 'No Herd' approach. Some of the evidence was dubious and some Economic consequences were perhaps optional. Log-graphs suggested that the COVID-19 threat was almost as serious in countries with 10 cases per day as it was in countries with 10,000 daily cases.

By contrast, ICT-viruses have a much shorter history but parallels with COVID-19 may exist. Maths Risk Analysis may have identified a strong-Governance ICT development technique in 1980 at RDW in Nederland. A Matrix Approach to the development of ICT functionality may point the way towards cheap and reliable prevention strategies for some ICT viruses. A Matrix Approach version with real-time calls to an SQL database was developed in 1991, followed by similar functionality for an Australian Bank in 1999. While Matrix functionality was on-developed by other companies in recent decades, low-volume functions that Humans performed under strict Governance rules may have been replaced by high-volume transactions that are automatically executed (see 'AIQ' by Polson).

Good Governance and mathematically strong Risk Analysis may be worth promoting for Banks and for COVID19-suspectable humans as the potential benefits are significant. It is important to identify pseudo-maths as quickly as possible. Modern ICT Methodologies and Tools may help to provide approaches to Good Governance and Independent experts may assist you with this analysis.

Q4. Do you see merit in further consolidation of the Committee's relevant principles on operational risk and resilience?

Yes, the Committee's principles on operational risk and resilience are being tested by events such as COVID-19 and further Dot.Com 'testing' may provide valuable information. The evidence from Australia is that the Basel 3 principles do not appear to be perfect.

VII. Measuring operational resilience

43. The Committee seeks specific feedback on the following measurement-related question:

Q5. What kind of metrics does your organisation find useful for measuring operational resilience? What data are used to produce these metrics?

Banks have existed for a long time and metrics for monitoring their operational resistance have been thoroughly tested. Banks have been using ICT-technology for many decades and some metrics that

used to be effective in previous decades may still apply. What is different is the number and volume of transactions, the outsourcing of important banking functionality to non-banks and to A-I bots.

It may be important to differentiate between Statistics and Media Reports when compiling operational resilience metrics.

Are there any significant benefits for the average Bank in very large datasets? How large can they grow? Given a choice, Banks would probably prefer a small number of profitable transactions to a large number of transactions that provide them with little profit.

Although A-I is mentioned frequently in other Basel 3 documents, it does not feature strongly in this important document.

Well done, keep up the splendid work.