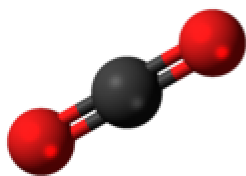

Actuaries Carbon Collaboration

Acting on climate solvency

Is our planet as safe as an insurer?

Louise Pryor, Roelof Coertze, and Tim den Dekker

Louise Pryor *is an actuary who focuses on sustainability. She believes that actuaries can be a force for good in the world, helping to reshape the financial system so that it serves society. Louise is co-chair of the Actuaries Carbon Collaboration and a past President of the Institute and Faculty of Actuaries. She is currently Chair of the Ecology Building Society, striving for a fair society in a sustainable world.*

Roelof Coertze *is an experienced actuary who is passionate about actuaries positively impacting the planet and society. He is co-chair of the Actuaries Carbon Collaboration and contributed to a number of IFOA working parties, including risk management, TCFD and on climate risk topics. He has helped set targets for carbon reduction and responsible investment, performed climate scenario testing and embedded ESG and TCFD reporting. He is also a father and wants to help leave the planet in good shape for his offspring.*

Tim den Dekker *is an architect and management consultant, and previously worked as an actuary. He is an associate at the architectural practice Feilden Clegg Bradley Studios where he specialises in low carbon and circular economy design. He is also a director at Lignum Risk Partners, independent insurance innovation consultants providing strategic risk advice for sustainable construction.*

This discussion paper was issued in April 2024. It was reviewed by Colin Wilson and other members of the Actuaries Carbon Collaboration.

Introduction

This is a fictional conversation but conveys how differently climate solvency and insurers' solvency are being managed. The Actuaries' Carbon Collaboration is exploring how to apply actuarial concepts used in insurance and elsewhere to managing climate change risk.

At the pub

It was a Wednesday evening down in the pub. Two youngsters (well, they looked young to us) were chatting at the next table. After the usual comments about how they hadn't seen each other for ages, conversation turned to their work. Ali, sitting closest to us, asked what Kris was currently working on.

"Well, I was called in to advise on this failing operation, on what resources it needs to stay afloat. Not a situation I've handled before, mind, but it's all common sense, isn't it? Basically, they were haemorrhaging money every year like there was no tomorrow. If they kept on as they were, they would have run out of capital in around seven to eight years. But they did have some new ideas for technical innovations that might help."

"So what did you advise?" Ali asked.

Some advice

"Well, first off we focused on what capital levels we thought they actually needed. You obviously need a bit of a buffer – operating at around zero capital isn't really feasible as it makes the owners rather uncomfortable. They also wanted us to look at projections all the way to 2050, because they're pretty attached to the operation. We allowed for all the types of events that our experts knew could happen, including whether and how the new ideas would work, and allowed for the probabilities, so we came up with the expected level of capital that would do the trick. At least that's what I was told – I'm not really an expert in this stuff."

We couldn't see Ali's face, but the three of us just looked at each other. Somehow, our own conversation had become rather less interesting.

"Hmm… it's certainly one approach. What about types of events that haven't happened before?"

"Of course we allowed for those, as long as our experts were sure that they were possible. Obviously we ignored the ones that the experts didn't think would happen – we didn't want to stray into speculation," said Kris.

"Right. OK. And what targets did you set for keeping capital at the right level?"

"Well, this is the really cool bit. You're an actuary, Ali, you like financial models, so you'll love this. I did a whole lot of projections to look at the long term situation. Obviously they needed to increase the money coming in and reduce what was going out. There were lots of possible pathways for profit levels, and I noticed that all the ones that showed capital levels staying high enough but not rising too high passed through zero profit in around 2050, so we set that as the target for the capital currently required."

An actuary, eh? We wondered how Ali would react.

"Interesting. Definitely interesting. What about milestones along the way? Don't you want to make sure the operation won't go bust before 2050?"

"Oh, we haven't really bothered about those. To be honest, getting to cashflow breakeven in 2050 is going to be really difficult, so we're going to focus on that. The new technologies the owners say they're considering are pretty leftfield, and have uncertain development trajectories, but they're reasonably confident they'll succeed in the long run."

"Does your chosen capital level ensure the enterprise doesn't collapse before the 2050 target is met?"

"We haven't really bothered about that either, because we don't want to confuse the issue. We are only considering the owners' brief of ensuring their operation is afloat in 2050."

By this time there were at least three people in the pub who were distinctly unimpressed by Kris, and we strongly suspected there was a fourth, judging by Ali's questions.

"And how are they going to increase their profitability? You said the whole thing is haemorrhaging capital," continued Ali.

"Well, they've got these cool technical innovations that they're working on that can turn things around. They believe those will develop into really profitable products by 2050, so that's all looking good. And meanwhile, there's a fancy accounting treatment that makes the losses look smaller by notionally transferring them to selected counterparties."

How insurers do it

"You know, this situation sounds rather familiar. Very like how we manage insurance companies, in a way, but your approach has some significant differences."

"You mean you think you can apply our approach to managing insurers?" asked Kris.

"To be honest, I was thinking more the other way round. I don't quite know how to put this, but it would be the height of irresponsibility to manage an insurer like that. What you're describing sounds incredibly risky."

"What's wrong with our approach?" Kris sounded rather apprehensive.

"Well, the idea of having a capital buffer is a good one, but I'm not at all sure about the way you've calculated it. Focusing on only the events you are sure can happen, rather than including all the ones that could possibly happen, or the ones that you don't even know about yet, is pretty risky, don't you think? You said you used the expected level of capital. That means there's a 50% chance there *won't* be enough capital by 2050. And by ignoring what happens before then, your operation could go bust well before. In insurance, we build in enough buffers to only have a 0.5% chance of running out of capital in a year, which combines to a much stronger chance than fifty-fifty for being afloat in 2050. We really don't want insurers to fail to pay out to their policyholders. But I suppose that the organisation you're working with doesn't really impact on ordinary people that much?"

"Well, um…"

"And an accountant would tell you that you're setting a flow-based target for a stock-based goal. What will happen if they keep their losses at current levels until 2049, and then suddenly reduce them in a single year? Won't they have run out of capital by that stage? For insurers, we use a control cycle or adjustment mechanism to create a feedback loop to prevent such a situation from happening."

"Er..."

"Also, it seems incredibly optimistic to rely on untried technical innovations that may not even happen. As I said, lucky it's only a small organisation with limited impact."

Kris looked a bit worried. "Actually, we based our approach on how governments are dealing with climate change. Are you saying it won't work for that, either?"

At that point we had to leave to catch our trains. As we rushed out, we agreed that Ali was on the right track, and were relieved to see an actuarial approach being applied to a broader problem. Kris and Ali looked rather bemused as we thrust our business cards at them, but we hope they'll be in touch so we can explore the issues further.