

Australian NCGP Reform - Model Interpretation Brief

What the model is for, what to believe, and what it tells us

iMORSE

System-dynamics model of the ARC National Competitive Grants Program

The question the model answers

The Australian Research Council is reshaping the National Competitive Grants Program from 2027: removing salaried mid-career and senior fellowships and redirecting the money to projects, standing up dedicated early-career and mentoring schemes (Initiate and Lead & Mentor), lifting dedicated Indigenous funding from about 1 per cent to 5 per cent, and simplifying 15 schemes to 7, all against a near-flat real budget. The model represents every one of the seven new schemes, not just the money that moves. It asks a single question over the decade to the mid-2030s: do those changes actually deliver more funded projects, a regenerated early-career workforce, stronger Indigenous research capability and sustained research output, or do feedback effects and slow-building supply offset them? The levers in play are the reforms - fellowship removal, the Initiate and Lead & Mentor scheme channels, the Indigenous step and scheme simplification - plus two contested assumptions: whether spreading funding helps or dilutes output, and how strongly researchers are pulled out of academia.

This model uses several system archetypes to organise its behaviour:

- **Limits to Growth.** the reform's growth ambitions run into slow-building supply - Indigenous capability, senior mentors, the PhD pipeline and assessor throughput.
- **Tragedy of the Commons.** one near-flat budget is drawn on by every scheme and cohort, so funding one group constrains another.
- **Success to the Successful.** funding concentrates on established researchers and institutions unless dispersal settings counter it.
- **Fixes that Fail.** removing fellowships to boost early-career researchers can undermine the mentoring capacity that produces them - which is exactly why the reform pairs removal with the Lead & Mentor scheme.
- **Shifting the Burden.** leaning on early-career project salaries and dispersal as the quick fix while the slow build of mentoring and Indigenous capability is under-addressed.
- **Eroding Goals.** under budget pressure, effective standards drift - success rates, project scale and the novelty bar - as proposals homogenise toward what wins.
- **Growth and Underinvestment.** if capacity - mentoring, Indigenous capability, assessors - is not built ahead of the demand the reform creates, the growth ambitions are choked off.

Archetype definitions

Complex systems behave according to a combination of one or more standard behaviour patterns known as 'archetypes'. It is the interplay of these that makes situations and decisions complex. They are either reinforcement ("Rx") or balancing ("Bx") - refer to the Narrative Report for more details. The archetypes identified in this model are:

- **Limits to growth.** A growth engine eventually meets a brake that has been quietly tightening. Central. The reform's growth ambitions (+200 projects, +20% researchers, five-fold Indigenous funding) run into slow-building supply limits - absorptive capacity (B2), partner pool (R3/S5) and peer-review throughput (B3). Growth engines exist but hit capacity ceilings.
- **Shifting the burden.** A quick fix relieves the symptom and slowly weakens the system's ability to address the cause. Present. Relying on ECR project-salary eligibility and dispersal as the quick fix for workforce renewal, while the fundamental slow build of mentoring capacity and Indigenous capability is under-addressed, risks dependence on the symptomatic solution and atrophy of the fundamental one.
- **Eroding goals.** When performance falls short, the goal quietly lowers to meet it. Present. Under budget pressure and cost inflation, effective standards can drift - success rates, project scale and the excellence/novelty bar - as the system homogenises proposals to what wins (report notes homogeneous three-year projects and conservative assessment).
- **Fixes that fail.** The fix solves the problem now and creates a worse version of it later. Present and important. Removing senior/mid-career fellowships to boost ECRs is a fix that can fail via R1 running vicious - lost mentoring and supervision capacity undermines the very ECR pipeline the fix intends to strengthen (eating the seed corn).
- **Success to the successful.** Two competing activities share resources, and the early winner gets richer at the loser's expense. Central. R2 and R5 are this archetype - the Matthew effect (from system dynamics theory, whereby those who already have an advantage tend to gain further advantages, while those starting behind become progressively more disadvantaged), concentrating funding on established researchers and institutions. It is the intellectual crux of the concentration-versus-dispersal debate the reform addresses.
- **Tragedy of the commons.** Each actor's rational choice degrades the shared resource everyone depends on. Central. B1 - the single near-flat budget drawn down by all seven schemes and every cohort. Reallocation to one group constrains others; the shared-resource coupling flagged at Stage 1.
- **Growth and underinvestment.** Capacity is not built in time, performance softens, and the case for investment evaporates. Present. If capacity (mentoring/supervision, Indigenous capability, assessor capability) is not invested in ahead of the demand the reform creates, the growth ambitions are choked off - the classic under-investment in the capacity that would let growth continue.

Assumptions that change how you read it

A few assumptions change how the results should be read. They impact the conclusion.

- **Real dollars, program-engaged workforce.** Everything is in real 2015 dollars, and the workforce shown is the pool of researchers competing for ARC grants. That pool contracts under the pre-reform funding squeeze; under the full reform, it grows again, by about a fifth, because the Initiate and Lead & Mentor schemes recruit early-career researchers and retain senior mentors. Read it against the total university academic workforce, which is a different and larger population.
- **The early-career gain rests on the schemes, not the money shuffle.** The model separates fellowship redistribution from the Initiate and Lead & Mentor scheme channels. Moving fellowship money to projects barely lifts early-career numbers on its own; the early-career gain comes from the schemes actually recruiting and mentoring. The recruitment magnitude (anchored to the ~300 Initiate grants per round) is an assumption on size, not the mechanism - the mechanism is documented policy.
- **Concentration versus dispersal is a choice, not a fact.** Whether spreading funding raises or dilutes research output is genuinely debated. It is a slider. If dispersal helps, the reform looks stronger on output; if concentration helps, the same reform depresses output even as project counts rise.
- **Senior researchers respond to fellowship removal.** The model assumes removing fellowships raises mid-career precarity and, through it, attrition. Lead & Mentor offsets part of this for the funded mentoring cohort, but the precarity effect on the wider mid-career group remains.
- **Levels are illustrative; shapes are the message.** The behavioural parameters are the model's main uncertainty. Trust the directions, the turning points and the gaps between scenarios, not the third decimal place.

What the model tells us about the dynamics

The best way to understand the dynamics at play is to interact with the model. However, some of the key dynamics findings are:

- **The pre-reform path squeezes projects hard.** With the fellowship share rising to 46 per cent, a declining real budget and rising costs, funded project-type grants fall through the 2010s and 2020s. This is the squeeze the reform responds to.
- **Fellowship removal is what recovers projects.** Redirecting fellowship money lifts funded projects to about 2,470 by the mid-2030s, against about 1,800 with no reform. Keep the fellowships and the same Indigenous and scheme reforms deliver only about 1,680 - the project recovery comes from the fellowship money, not the other changes.
- **The early-career gain comes from the schemes, not the redistribution.** The full reform lifts early-career researchers from about 2,180 to about 3,440 by the mid-2030s and their share from roughly 19 to 25 per cent. But with the Initiate and Lead & Mentor channels switched

off, fellowship money still redirected to projects, and early-career numbers staying flat at about 2,180. The reform's headline early-career ambition depends almost entirely on those two schemes working.

- **With the schemes on, the workforce grows rather than hollows out.** Lead & Mentor preserves senior mentoring and retains mentors, and Initiate recruits early-career researchers, so the program-engaged workforce rises from about 11,300 to about 13,900 - roughly the 20 per cent more researchers the ARC's own modelling claims. Switch the schemes off and the workforce keeps contracting - the old 'eating the seed corn' path.
- **Precarity is displaced, not removed.** Removing salaried senior and mid-career fellowships sharply raises mid-career precarity even as early-career precarity eases. The reform moves insecurity up the career pipeline rather than reducing it overall.
- **Indigenous capability grows, but slowly and under any variant.** The 1-to-5 per cent step lifts Indigenous researchers from about 300 to about 460 by the mid-2030s, regardless of the other levers, but it is gated by mentoring capacity that builds over years, so the money (a fivefold rise) runs well ahead of the people it can support (about a fifty per cent rise).
- **Supply, not money, is the ceiling the reform eventually meets.** Funded projects and research impact step up under the reform, then erode across the decade as project costs escalate and capacity tightens. A static forecast, read at a single future point, cannot see this; a dynamic one does.

The strategies at a glance

Four settings, one table. These are scenarios, not forecasts. Each row is a setting a board can click in the simulator, read at the mid-2030s horizon. Funded projects, early-career and Indigenous counts are model endpoints; precarity is read as a shape. The middle two rows decompose the reform: projects come from removing fellowships, early-career numbers come from the schemes.

Strategy	What it changes	Funded projects	Early-career researchers	Indigenous researchers	Mid-career precarity
No reform (baseline)	Fellowships kept, 1% Indigenous, 15 schemes, no scheme channels	~1,800	~2,180	~300	low
Full reform (all seven schemes)	Fellowships to projects, 5% Indigenous, 7 schemes, Initiate + Lead & Mentor on	~2,470	~3,440	~460	high
Reform, funding redistribution only	As full reform but Initiate and Lead & Mentor off	~2,470	~2,180	~460	high

Reform, keep fellowships	Everything on except fellowship removal	~1,680	~3,440	~460	low
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The pattern is a set of trade-offs, not a free win. Removing fellowships is the only path that recovers project volume - and it is also what raises mid-career precarity. The early-career recovery is separable from that: it comes from the Initiate and Lead & Mentor schemes, and it survives even if fellowships are kept. The Indigenous gain is available under every reform variant but lags the money. Which combination a board accepts is a judgement the model informs but does not make.

A fifth setting, 'Full reform, concentration view', holds the same project, early-career and Indigenous outcomes as full reform but assumes concentration rather than dispersal raises research output; it is where the impact measures move, not the counts. It is the objective place to test how much of the reform's value rests on that contested assumption.