

Submission to the *Universities Accord* consultation: **Supporting Startups from Australian Universities**

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Background: Australian universities lag in translating high quality research into commercial outcomes. This is a long-standing problem, indicating that there are unresolved barriers in university commercialisation practices. The relatively recent Higher Education Research Commercialisation review, also conducted by DESE, sought to address this, but with few structural changes consequent.

This submission, which I provide in my personal capacity, is aimed at improving startup formation from publicly funded Australian research. This addresses the interim accord section **2.7.2.5: Keep encouraging universities to move towards research translation and commercialisation**.

My principal hypothesis is that Australian Universities do poorly at research commercialisation via startup formation because there is a risk-benefit imbalance. Specifically:

1. Benefit to universities is low: Typical revenue to research-intensive Australian universities from ongoing IP commercialisation is at or less than AU\$5 million per year¹. This is generally less than 1% of total university revenue, and is lumpy and long-term. So it is not a reliable revenue stream, and the benefit is unpredictable.
2. Apparent/perceived risk to universities is high: commercialisation is perceived to carry short-term institutional risks, from IP leakage, conflicts-of-interest, or legal liability.

With relatively small institutional revenue, but high perceived risk, university executives do not have a strong institutional motivation to support startup activity.

This submission to the University Accord process is intended to provide practical solutions that Federal and State Governments could adopt to address the risk-benefit imbalance in Australian university research commercialisation. The goal of these solutions is to drive much more effective commercialisation through startup formation. Implementing them would require an "accord" between government, universities, researchers, investors, and other relevant participants, and so I believe the University accord review is an ideal vehicle for these solutions..

Recommendations Summary: This submission provides a brief description for two strategies which correct the benefit-risk imbalance

- A. Create an *Innovation Block Grant* that incentivises universities to support startup formation. Grants would be conditioned on investment flowing into new startups based on university IP.
- B. Create a "Standard Model" for researcher-led startups, backed by legal shields for universities that implement it.

I describe these two recommendations in more detail below.

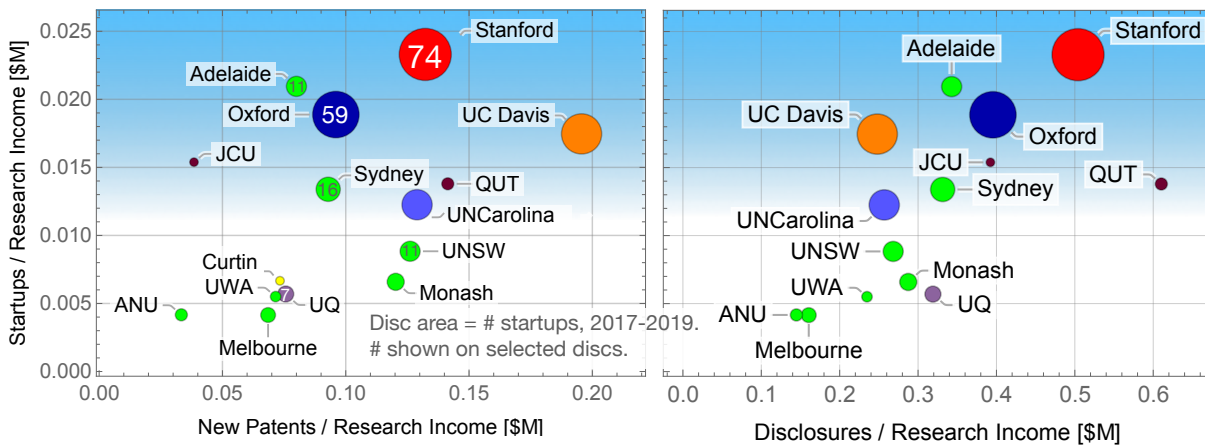
Bio: I am an academic who has worked on quantum technologies for over 20 years, and have been closely involved in the conduct and management of Australian quantum science through the ARC Centre of Excellence in Engineered Quantum Systems (equs.org).

I am also a co-founder and CEO of a quantum technology startup, Analog Quantum Circuits Pty Ltd (AQC, aqcircuits.com), which is the first quantum technology startup in Queensland, and is focussed on developing advanced superconducting hardware for quantum computers.

Prior to forming AQC I had an earlier attempt to found a startup based on my research, in partnership with research colleagues at other Australian universities. This earlier attempt failed, despite securing a \$1.5M investment offer from an independent investor, because of irreconcilable commercialisation practices across the relevant universities.

Given my experiences as an academic and startup founder, I believe I have a unique perspective on Australian research commercialisation.

¹ Data for Australian institutions is from the KCA *Survey Of Commercial Outcomes From Public Research* (SCOPR), published in 2020. International data is from other sources, available on request.



Startup formation rate over 2017-2019 at select Australian and international universities versus new patents (left), and versus disclosures (right), normalised by research income.

Startup data and performance: The plots above show my analysis of SCOPR¹ data for Australian university startup formation against patent and disclosure activity over 2017-2019, together with comparison data for some international institutions. The plot axes are normalised by research income, so that different sized institutions can be fairly compared.

Clearly disclosures rates of IP by researchers correlate with startup formation, which is indicative of the fact that research-intensive startups build on the underlying basic research undertaken at universities. Patenting rates are less correlated.

More significantly, Australian universities perform 2 to 3 times worse than international peers in their output rates of startups, relative to research income. This comparison is the basis for my assertion that Australian universities are objectively underperforming in startup production for research commercialisation.

My hypothesis that the relatively low formation rates of startups from Australian universities is a consequence of risk-benefit imbalance. This hypothesis is formulated in response to the actual commercial returns to Australian universities, the practices around conflicts-of-interest management, and my own experiences. The recommendations here are an effort to address this imbalance.

Recommendation A: Create an Innovation Block Grant.

Background: Given that potential commercial returns from startups to universities are lumpy, slow, and unpredictable, the incentives are dominated by risk-aversion and overvaluation of universities' IP relative to founder and investor interests. This restricts the formation of startups, as deals are rejected that might succeed under more equitable valuations.

Recommendation A: Create a Government-funded incentive scheme, an *Innovation Block Grant* (IBG), described below, that rewards universities for generating startups. This will motivate universities to resolve internal bottlenecks.

Implementation Model: An IBG fund is created, analogous to existing Research Block Grant funds. Whenever a new startup forms based on university IP, the university becomes eligible for an IBG payment. To qualify, the startup would need to attract sufficient arms-length investment from one or more independent investors to develop the university IP.

The amount paid to the university by the fund would be proportional to the post-investment company valuation (around 2.5%), based on the value of equity held by non-university shareholders at the start of operations. More sophisticated formulations could progressively reward higher startup formation rates, if necessary.

Example scenario: Suppose a startup, *NewCo*, forms, based on research at university *UofX*. *NewCo* licences IP from *UofX* in exchange for 10% equity in *NewCo*. *NewCo* attracts \$2M in cash investment from independent investors, with a post-investment startup valuation of \$10M. The non-University equity (\$9M) is held by *NewCo* investors (\$2M) and founders (\$7M).

The University is then entitled to an amount equal to 2.5% of the \$9M in non-University equity valuation (i.e. \$225k), paid from the IBG fund to the university itself.

Rationale: During operation, startups represent economic activity — skilled jobs, capital investment, taxable revenue — that benefit the Government and society, whether or not the startup is ultimately successful commercially.

IBG income would induce universities to improve startup formation rates by:

3. Incentivising institutions to increase startup formation rates, and total value created, apart from university held equity. This will drive universities to sensibly value their IP, to manage risk effectively, and to adopt other practices that support startup formation.
4. Providing reliable income to universities to cover the costs of effective technology transfer, including administrators, incubators, accelerators etc.
5. Aligning incentives to create innovative startups with actions that are in the control of the university itself, and reducing exposure to commercial uncertainties outside university control.
6. Aligning the time-scale for university revenues from startup formation with the time-scale of technology transfer (months), rather than future commercial returns (years-to-decades).

Avoiding unintended side-effects: Tying IBG income to post-investment valuations by independent investors mitigates potential risks of artificially inflated startup activity (e.g. excessive patent filing, paper company registration etc) and valuations. It also imposes market discipline on the formation of startups: only those that are able to persuade sophisticated investors to fund the development will attract IBG funding.

Funding Quantum: Assuming a payout of 2.5% of post-investment startup valuation, an indicative annual IBG budget of \$50M would be expended only after the formation of new startups collectively valued at \$2B.

Ideally, the IBG fund would be committed over a 5 year trial period, with annual reviews, to give the scheme sufficient time to demonstrate its efficacy.

Outcomes: The success of the program would be measured by the increase of university startup formation rates and valuations relative to baseline performance.

Assuming typical seed-round valuations of \$5M to \$10M, full IBG expenditure would result after the formation of >100 new university startups per year. This would represent a substantial increase relative to the current startup formation rate (around 40 in 2019).

Comment: This proposal may be counter-intuitive: it does not directly subsidise the development of university IP or startups, and the funding goes to consolidated university income.

The primary response to this is that direct Government support schemes already exist, including through tax incentives, Commercialisation Australia, etc, but none resolves the incentive-gap that exists within the university sector. An Innovation Block Grant directly addresses this gap by rewarding universities for supporting economically beneficial outcomes.

Recommendation B: De-risk universities who support startup formation.

Universities summarise their risk tolerance in their Risk Appetite Statement. On commercialisation via startup formation, some appear bullish. For example, Adelaide University says it has:

“Highest [risk] tolerance for promoting and supporting start-ups and early capital investment in prospecting and market testing, to deliver the desired markets and products”².

But the underlying threats are articulated in university “conflicts-of-interest” (COI) policies. These really go to implementation. For example, Monash University has summarised COI scenarios relevant to startup formation³:

- *Where a staff member has a financial/personal interest in an enterprise with which the University does business.*
- *Holding official positions in companies conducting research at the University while simultaneously being a staff member.*
- *Use of unpublished information emanating from University research for personal profit.*
- *Negotiations by a staff member of IP licensing to an external entity in which the staff member has a financial interest.*

² <https://www.adelaide.edu.au/legalandrisk/ua/media/2454/risk-appetite-table.pdf>

³ https://www.monash.edu/_data/assets/pdf_file/0009/1248489/Conflict-of-Interest-Examples-and-Actions-Guideline.pdf

- A staff member holding shares in a company that is sponsoring research at the University, where that research is managed by the staff member.

These illustrate the kinds of risk that Uni administrators are concerned with. Managing COIs costs time and resources, but also carries the latent potential that COI-management turns out, in some instances, to be ineffective.

On legal risk, Adelaide university's risk position is:

“a conservative appetite for risk towards regulation and compliance, ... zero [risk] tolerance for legal and compliance breaches.”²

How should a university executive balance the highest risk tolerance for startups with zero risk tolerance for COI compliance breaches?

More precisely: if the perceived risk outweighs the (relatively small) financial benefit from supporting startup formation, then the obvious risk-free solution is to effectively prohibit startup formation.

A solution to providing certainty for university executives that effectively eliminates institutional risk involves creating the following structures:

- i) **a sector-wide “Standard Model” for researcher-led startups.** This should address typical situations (e.g. investor-backed, organic-growth etc), and cover everything required of an institution to support formation of startups, including IP licensing terms, equity position, COI management, etc. Developing this will require an accord between universities, researchers, governments, investors and others. It should maintain a balance between being prescriptive and being flexible. There are workable models internationally that Australia can adapt.
- ii) **a legal shield for institutions that implement the Standard Model.** For example, university executives want to avoid being targets of investigations by State-based integrity commissions (e.g. the CCC in QLD, ICAC in NSW etc). A statutory protection from such investigations for institutions / executives that implement the Standard Model would reduce legal risk substantially. Implementing this will require legislation at the State level, but national policy can support a common set of rules for implementation.

Summary

Addressing the risk-benefit imbalance requires a two-part solution, by reducing or eliminating risks with well-defined and legally protected pathways for universities to form startups, as well as direct payments to universities when their research results in economically active startups to improve the benefit side of the equation.

This approach is testable, and so lends itself to empirical policy design and evaluation.

Implementing both of these components of the solution will require collective action amongst governments at State and Federal levels, investors, universities, and with actively engaged researchers like myself. As such, the University Accord process is the ideal vehicle to drive this change, for the benefit of Australia’s economy.