Innovation and Entrepreneurship Research Peak- Workshop

4th March 2025

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SMU

The focus of the entrepreneurship research peak is to develop interdisciplinary collaboration within the business school areas (and across SMU's schools) that leads to impactful academic research.

In addition, the research peak aims to galvanize faculty for tier II or III grant applications in the research area.

Agenda

- Welcome
- Dr. Cheong Wei Yang, Vice Provost Strategic Research Partnerships, share on potential research opportunities with SSG Data.
- Prof. Reddi Kotha and Dr. Ge Xu introduce the release of the LKY Business Plan Competition data (11thEdition, 2023) to SMU researchers.
- Any other matters & Discussion

Welcome

Hosts and invited speakers for the workshop

- Reddi Kotha, Professor of Strategy & Entrepreneurship, Innovation & Entrepreneurship Research Peak Lead, Associate Editor Academy of Management Journal
- Cheong Wei Yang, Vice Provost (Strategic Research Partnerships)
- Seonghoon Kim, Associate Professor of Economics; Deputy Director, Centre for Research on Successful Ageing (ROSA)
- Ge Xu, Innovation & Entrepreneurship Research Fellow

Potential Research Opportunities with SSG Data

Dr. Cheong Wei Yang, Vice Provost Strategic Research Partnerships

Research Objectives/Questions	
Phase 1: Establishing Correlations •Establish correlations by linking SSG admin data with earnings data from IRAS & CPF and survey data for non-tangible outcomes Measures **1.Employment and Income Effects**: Track job status, salary changes, CPF contributions and long-term earnings progression (IRAS & CPF data). Job retention and career mobility analyzed to assess long-term stability **2.Non-Tangible Outcomes**: Survey data on well-being, job satisfaction and social engagement to capture self-reported changes post-training **3.Programme Effectiveness**: Link SSG data on course type, format and certification level with earnings data (IRAS & CPF) and survey responses **4.Return on Investment (ROI)**: Earnings growth (IRAS & CPF) compared against programme costs (SSG data), stratified by individual characteristics, work arrangements and age groups **5.Training Modalities**: Evaluate impact of online, hybrid and in-person training formats by linking SSG programme data with employment/income trends (IRAS & CPF) and survey engagement measures	**Phase 2: Randomised field experiments with SSG partners (e.g., SMU Academy)** •Establish causal relationships to refine programme delivery, content and engagement strategies based on Phase 1 findings •Use experimental data to validate and enhance ML-based prediction model developed in Phase 1 to enhance course recommendation and curation **Resources requested by SMU to support the study** •2 dedicated economics postdocs to work on Phase 1 and establish the correlations. •Support from SSG for the design, piloting, pre-testing, and analysis of surveys •To work with SSG partners (e.g., SMU Academy) to deliver survey and introduce small nudges based on the correlations found in Phase 1

SSG's inputs

SSG supports this EOI with the following inputs:

Strategic Planning Division (SPD) Research Office and Economics Office

•Focus on **Measures 2, 3 and 5**, as 1 and 4 will come from the findings of the MTI/DOS landscape study which will be available later this year

•Consider assessing impact based on specific programme outcomes and comparing cost-effectiveness to provide a comprehensive review

•Consider incorporating enterprise outcomes (e.g., productivity, employee retention, operational efficiency, cost savings, growth and profitability)

Quality Management Division (QMD)

•**Measure 1**: Consider reduction of unemployment duration in addition to job retention and career mobility

•**Measure 2**: Consider in-course metrics (assessment scores, dropout rates, curriculum alignment scores); Explore correlations between course quality/curriculum characteristics and learner outcomes

•**Measure 3:** For survey, consider target audience that is not on payroll (e.g. type of learners, quality of programme)

•Elaborate on the nudges introduced in Phase 2

Planning & Programmes Division (PPD)

Lines of inquiry to include:

•Effects of funding levels and type (supply-side vs. demand-side) on outcomes (Does higher funding or provision of demand- or supply-side yields better outcomes?)

•Effects of TP-types (i.e., IHLs vs. private CET Centres vs. other private TPs) on training outcomes

LKY Business Plan Data

Professor Reddi Kotha, School of Business

Dr. Ge Xu, Post Doctoral Fellow Innovation & Entrepreneurship

Project 1: Causal Effects of BPC Finalist

A Method to Estimate Within Business Plan Competition Causal Effects on Deep-Tech Start-ups Selected to the Finals of the Competition

Ge Xu, Prof. Seonghoon Kim, Prof. Reddi Kotha

Judge panels

Judge evaluation
612 start-ups
Evaluated by 183 judges in 44 panels

HHP, Human Health & Potential (10 panels)
M&E, Media & Entertainment (3 panels)
MTC, Manufacturing, Trade & Connectivity (4 panels)
SNDE, Smart Nation & Digital Economy (8 panels)
USS, Urban Solutions & Sustainability (19 panels)

- Each panel consists of **3 to 7 judges** to evaluate **5 to 21 start-ups**
- Each judge was provided with a notional investment pool of **one million SGD** to allocate among the startups in their panel, simulating real-world investment decisions
- Rank each start-up by **average judge score**

Consideration list
189 start-ups

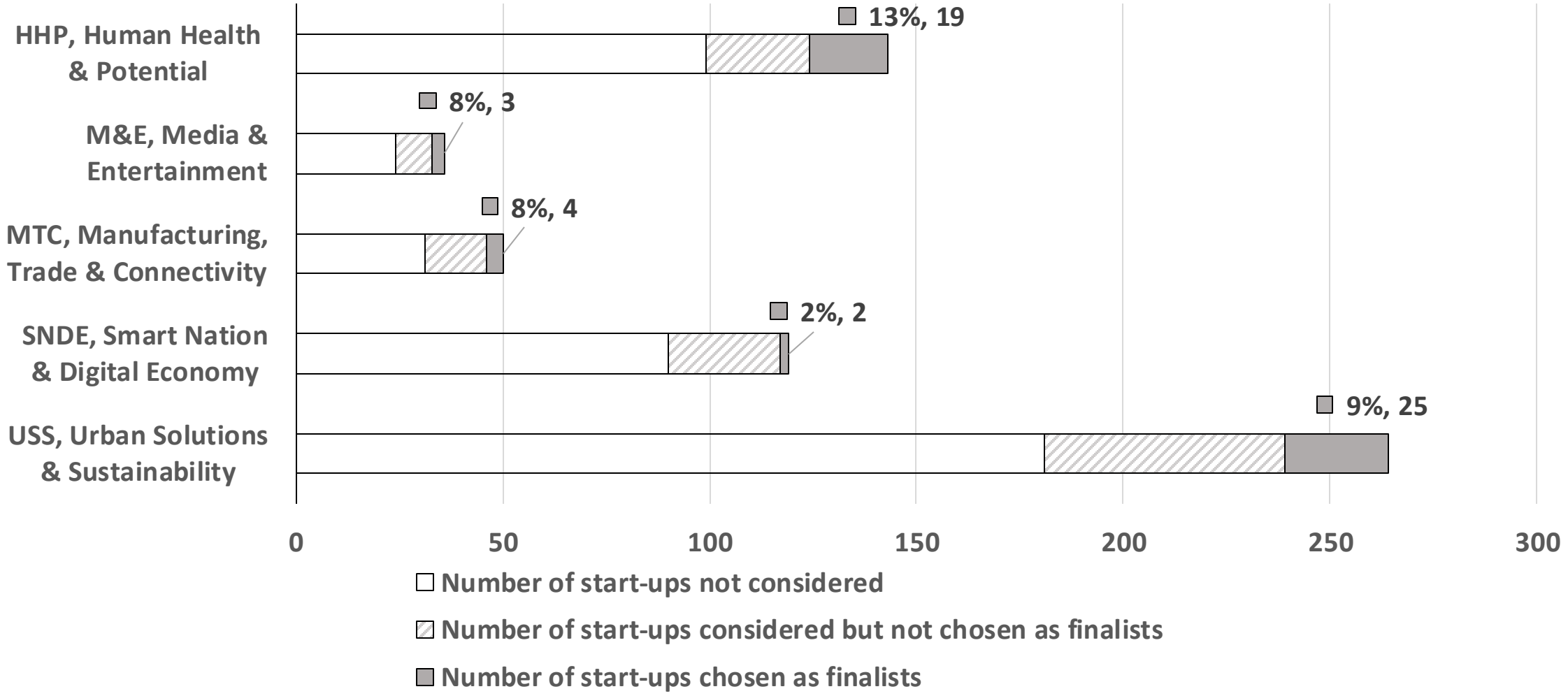
Union of the two lists:
- Top ranking start-ups by average judge score within each panel (typically top 3)
- Top 150 among all start-ups ranked by average judge score

- An expertise committee from the competition organizer team reviewed the consideration list to select the finalist winners

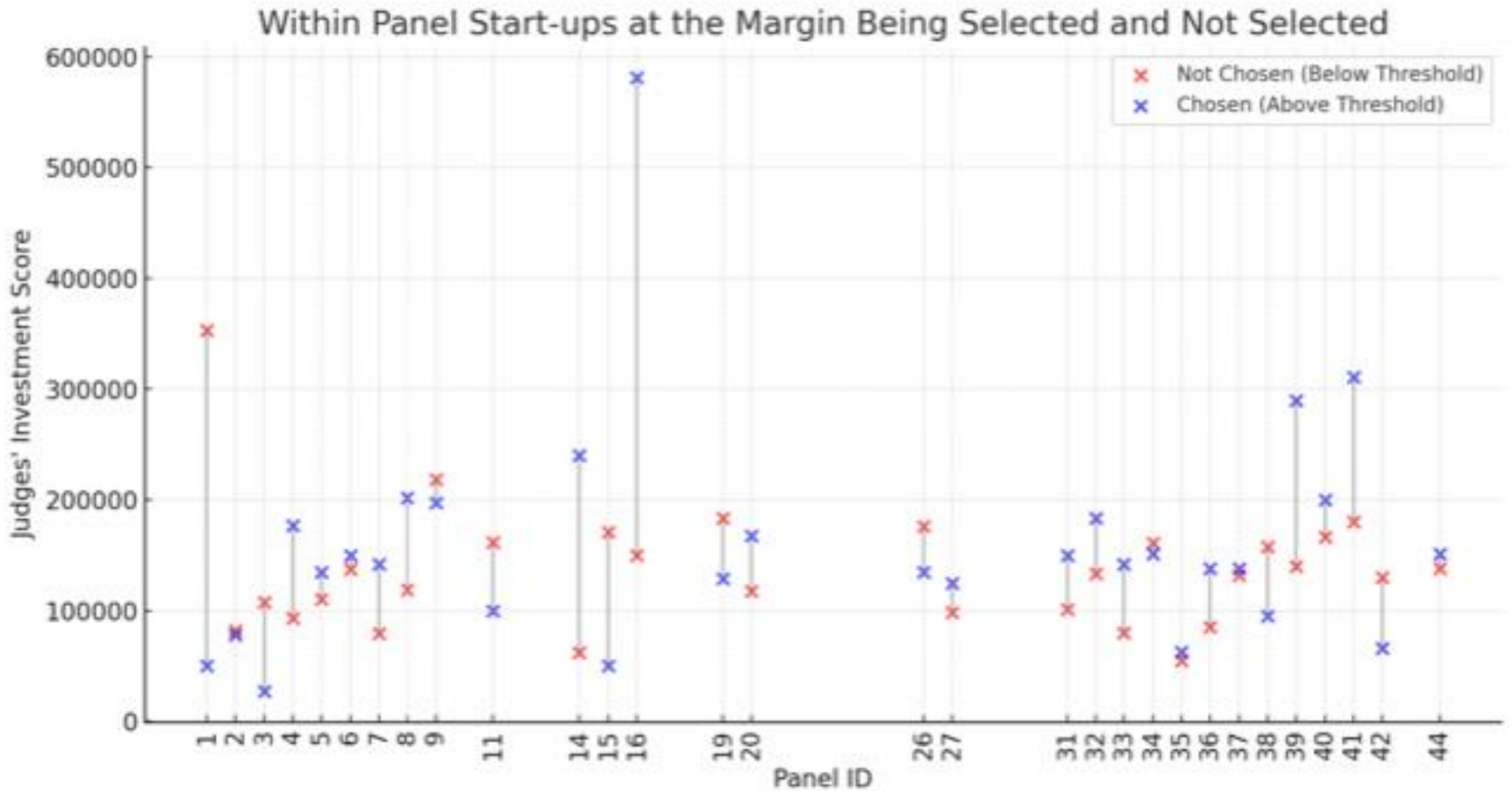
Finalist
53 start-ups from 30 panels

- Visit SMU for one week
- Social and networking events (finalist start-ups, mentors from SMU IIE, judges, sponsors…)
- In person pitching to judges for final ranking

Judge panels and start-ups selection



Within Panel Start-ups at the Margin Being Selected and Not Selected



Performance estimation with different versions of the DV

DV: VC investment after the competition	OLS				Threshold models (in small samples)			
	Whether the start-up received VC investment	VC investment received (in $1M USD)	Log(VC investment received)	Whether VC investment received is over $1M USD	Whether the start-up received VC investment	VC investment received (in $1M USD)	Log(VC investment received)	Whether VC investment received is over $1M USD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Whether the start-up is a finalist winner	0.166***	0.654**	1.874**	0.135**	0.20**	0.61*	1.99**	0.13**
	(0.062)	(0.285)	(0.808)	(0.053)	(0.09)	(0.33)	(0.97)	(0.06)
Panel dummy (M&E)	-0.056**	-0.135	-0.506*	-0.032*	-0.04	0.36	0.92	0.06
	(0.024)	(0.087)	(0.274)	(0.018)	(0.12)	(0.57)	(1.52)	(0.10)
Panel dummy (MTC)	0.159***	0.175	1.262*	0.058	0.35*	1.07	3.09	0.20
	(0.059)	(0.138)	(0.678)	(0.041)	(0.18)	(0.86)	(2.37)	(0.15)
Panel dummy (SNDE)	0.023	0.037	0.311	0.009	0.04	0.66	1.79*	0.12*
	(0.031)	(0.094)	(0.308)	(0.019)	(0.11)	(0.44)	(1.04)	(0.07)
Panel dummy (USS)	0.015	0.098	0.483	0.021	0.02	0.69	2.02*	0.13*
	(0.026)	(0.092)	(0.297)	(0.019)	(0.11)	(0.45)	(1.08)	(0.07)
Early stage dummy	-0.017	-0.045	-0.112	0.006	0.07	0.19	0.56	0.04
	(0.029)	(0.142)	(0.357)	(0.021)	(0.07)	(0.27)	(0.73)	(0.05)
VC investment received before the competition (in $1M USD)	0.025	0.085	0.451**	0.032**	-0.03*	-0.04	-0.20	-0.01
	(0.016)	(0.054)	(0.216)	(0.015)	(0.02)	(0.06)	(0.20)	(0.01)
Number of team members	-0.005	-0.026**	-0.026	-0.004*	-0.03**	-0.08*	-0.23*	-0.02*
	(0.004)	(0.012)	(0.048)	(0.002)	(0.01)	(0.04)	(0.12)	(0.01)
Average team member age	0.006**	-0.001	0.039*	0.002	0.00	-0.02	-0.04	-0.00
	(0.003)	(0.005)	(0.023)	(0.001)	(0.00)	(0.02)	(0.04)	(0.00)
Share of female team members	-0.044	-0.253***	-0.958***	-0.054***	-0.08	-0.35	-1.32	-0.09
	(0.028)	(0.092)	(0.296)	(0.017)	(0.09)	(0.33)	(1.06)	(0.07)
Share of team members with doctoral degree	-0.027	-0.024	-0.372	-0.009	0.05	1.03	2.35	0.15
	(0.042)	(0.157)	(0.435)	(0.027)	(0.14)	(0.73)	(1.54)	(0.10)
Constant	-0.076	0.222	-0.425	-0.012				
	(0.073)	(0.217)	(0.644)	(0.038)				
Observations	611	611	611	611	60	60	60	60
R-squared	0.109	0.068	0.100	0.115	0.31	0.28	0.30	0.30
Mean of Dep. Var	0.077	0.148	0.729	0.038	0.117	0.326	1.013	0.067

Project 2: AI versus judges on power-law-type decision-making

Prof. Reddi Kotha, Ge Xu, Prof. Niloofar Abolfathi, Prof. Dimo Dimov, Prof. Lingxiao Jiang

- **Overlap Between Human Judges and the AI Tool (used by competition organizer)**
  – Analyze the lack of overlap in evaluations
  – Examine how the AI tool's ratings are less selective, clustering high ratings more tightly than human judges
- **Predictive Power Comparison (Human Judges, AI Tool and ChatGPT)**
  – Compare the predictive power of the AI tool with that of human judges—against subsequent VC funding and the AI tool's ratings
  – Use ChatGPT to assign scores to startups based on their suitability for the competition, analyze the overlap between ChatGPT's rankings and other evaluations
- **AI Tool Analysis**
  – Discuss observations that suggest the suitability of AI tools (ChatGPT and AI Tool used by the competition organizer) for power-law-type decision-making

Project 3: Advisors and startup fundraising

Prof. Niloofar Abolfathi

Advisors and startup fundraising: Examining the role of advisors in startups evaluations and fundraising success.

- What's the effect of having advisors on startup fundraising?
- What are the mechanisms and contingencies through which advisors can help funding raising startup?
- Conducted a field experiment exploring these questions

Any other Matters?

Thank you!
See you next time!