The Role of Universities in *Regional* Green Economies:

A Perspective from the University Office that is at the Nexus of Research & Business

Innovating the Green Economy
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Agenda: *5-10 Minutes*

1. General Potential for Universities to Drive Regional Green Economies
2. Range of Alternative Approaches for Universities (& Gov)
3. Specific Examples of UCB Approaches (via Tech Commercialization Office)

Potential of University-Driven Regional Economy

- Local corporate R&D centers based on university **collaborations**
  - No historical data, just anecdotal:
  - Intel Lablette, Siemens TTB, Starkey R&D, BP EBI, BWRC, etc
  - In a decade, western edge of campus will have dozens of corp R&D offices
- Start-ups based on university **innovations***
  - Over past 5 years, UCB has done about 30-40 IP rights agreements per year
  - About half of those agreements are with start-ups
  - About half of those start-ups are commercializing green technologies
  - Many regions only dream about that economic development pipeline
  - Opportunity for 2 scenarios (City of Berkeley Planning Commission, Feb 2009)…

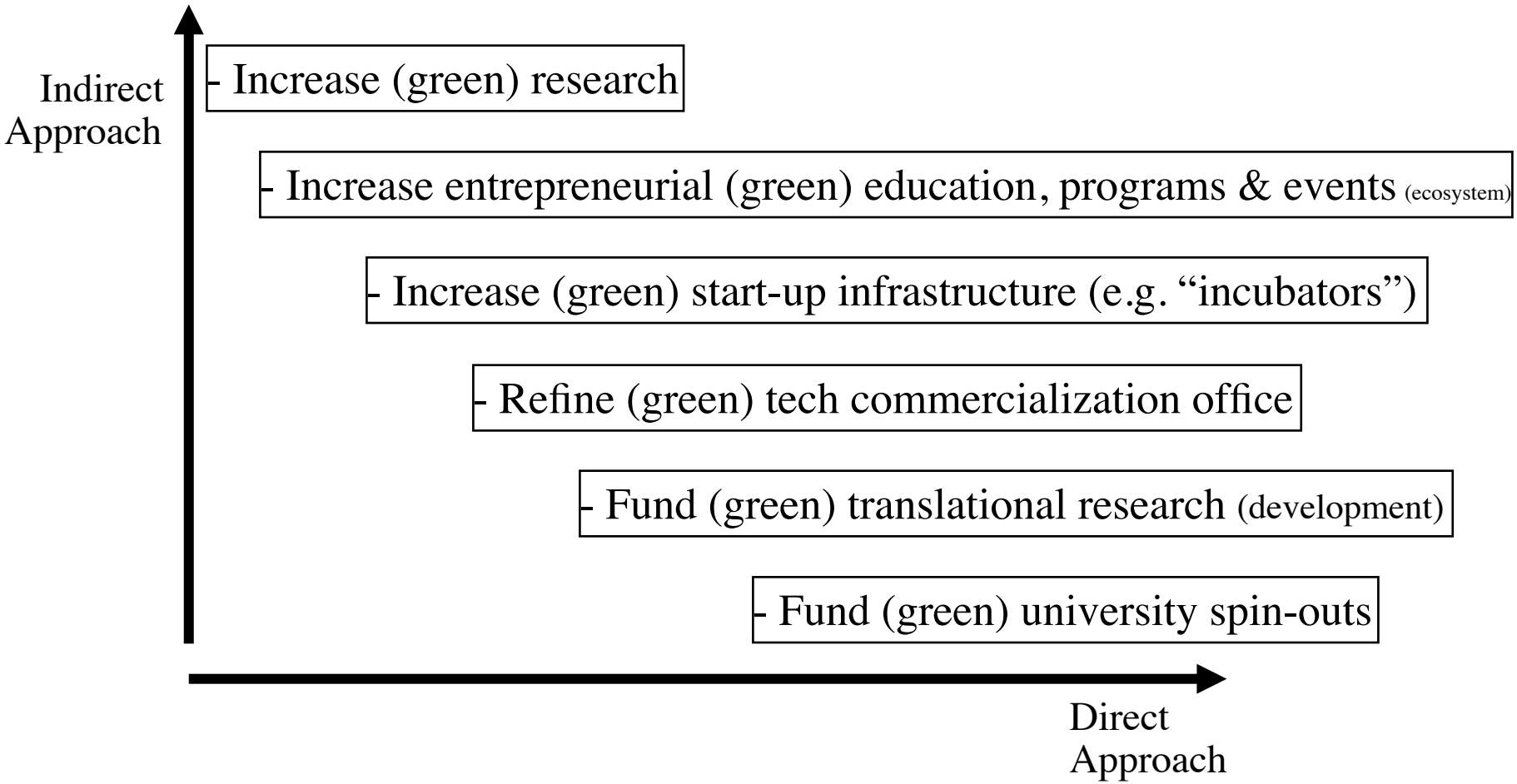
* These numbers are comprised of the start-ups that leveraged UC Berkeley's intellectual property (i.e. patentable inventions & copyrightable software). The numbers don't include other UC Berkeley spin-outs that didn't leverage the University's intellectual property.

University-Driven Potential: *2 Scenarios*

Scenario: SQUANDERING the Opportunity (25% attract; 25% retain)						
	Year 1	Year 2	Year 3	Year 4	Year 5	Assumptions
New Startups	15	15	15	15	15	15
Attract: Stay Local	4	4	4	4	4	25%
Shut-down in Yr 1	0	-1	-1	-1	-1	25%
Retain: Move-out in Yr 1	0	-3	-3	-3	-3	25%
Retain: Move-out in Yr 2	0	0	-1	-1	-1	25%
Aggregate Growing Corps	4	4	3	2	**2**	

Scenario: LEVERAGING the Opportunity (75% attract; 75% retain)						
	Year 1	Year 2	Year 3	Year 4	Year 5	Assumptions
New Startups	15	15	15	15	15	15
Attract: Stay Local	11	11	11	11	11	75%
Shut-down in Yr 1	0	-3	-3	-3	-3	25%
Retain: Move-out in Yr 1	0	-3	-3	-3	-3	75%
Retain: Move-out in Yr 2	0	0	-2	-2	-2	75%
Aggregate Growing Corps	11	17	20	24	**27**	

University Approaches For Driving the Economy



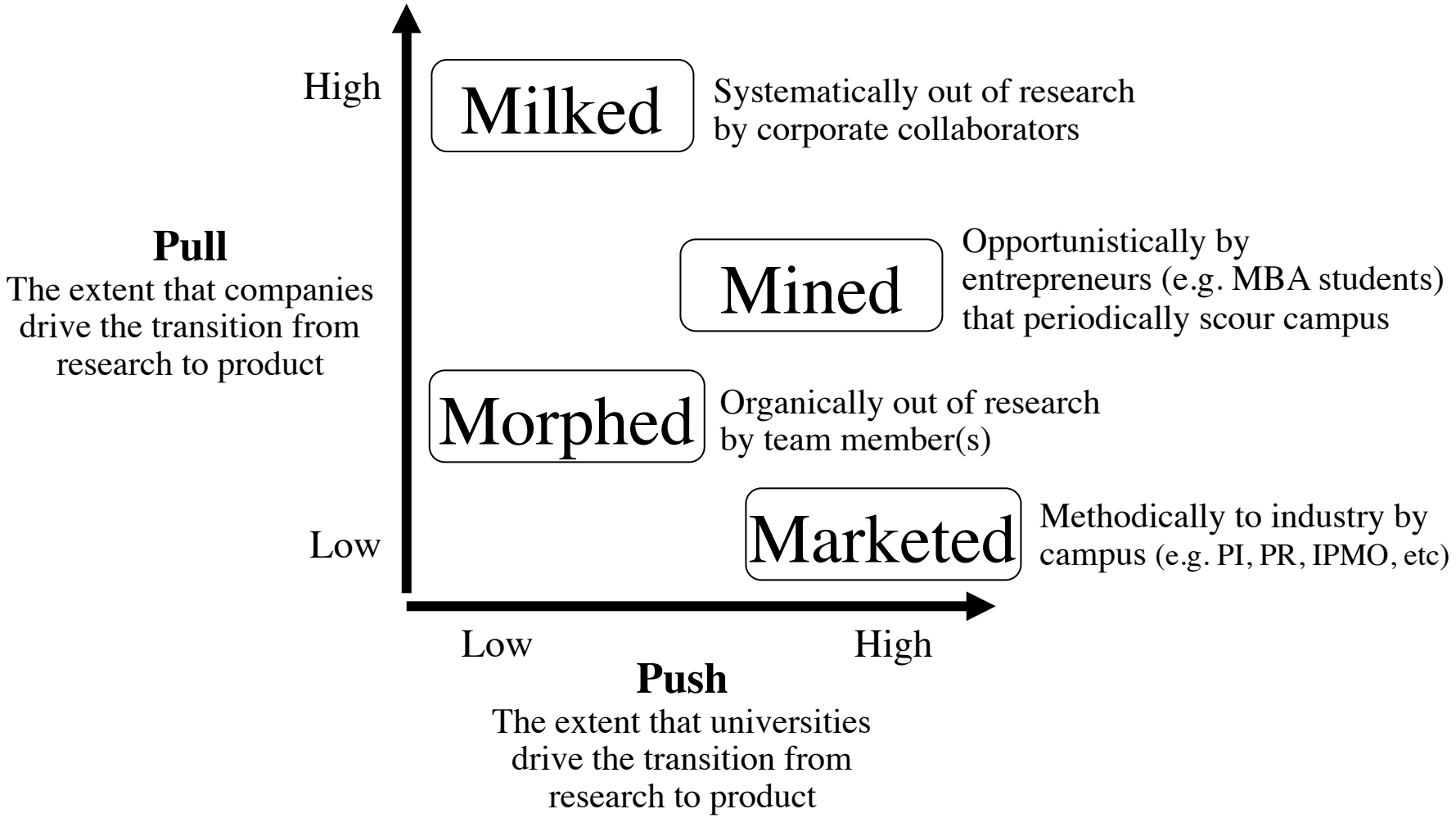
University Approaches: *Unique Situations*

- Situations vary for each university
  - UC Berkeley vs UC Merced vs UT Austin vs MIT vs NUS etc
  - Variables: innovations, entrepreneurs, venture capital, ecosystem?
    - Deficiencies?
    - Maximum incremental value?
- UC Berkeley
  - Increase innovative research
  - Increase entrepreneurial ecosystem (education, programs, events, etc)
- **What about *the tech commercialization office* *(AKA Tech Transfer)*?**

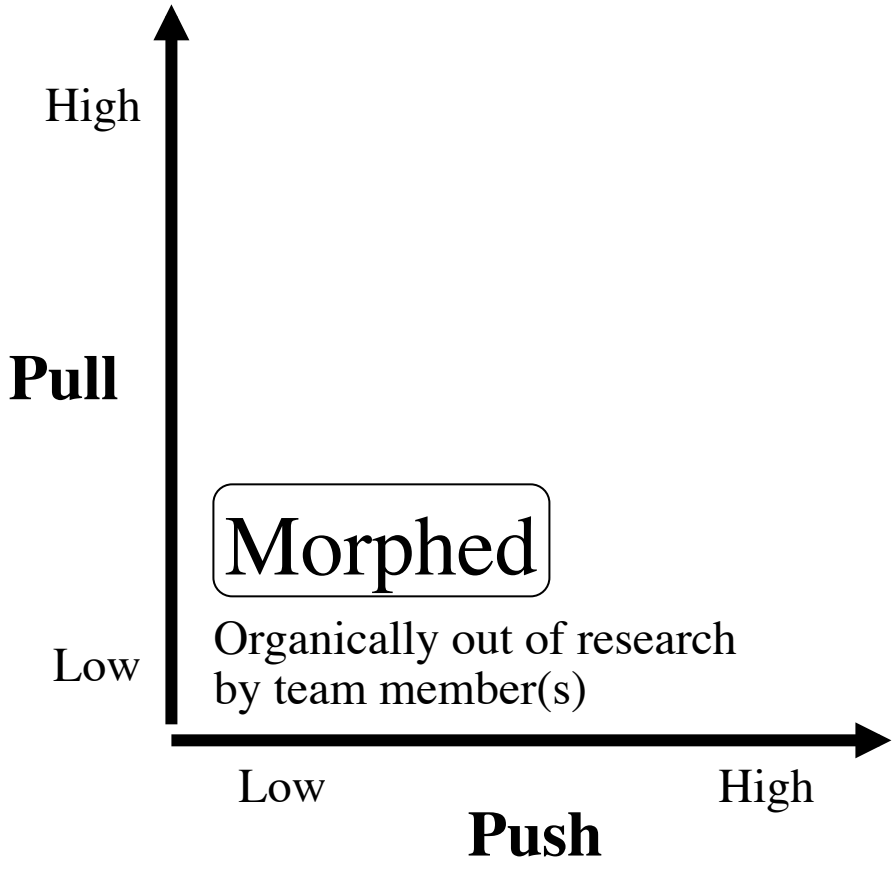
Research to Determine How University Innovations Get Commercialized

- How do university innovations get commercialized?
  - What catalyzed the commercialization?
  - How is university involved in the process?
- Researched over 50 UC Berkeley spin-outs
  - Spin-out profiles formed 4 clusters / patterns
  - Developed a useful (but simplified) framework…

Commercializing: *4 Pathways for Univ Tech*

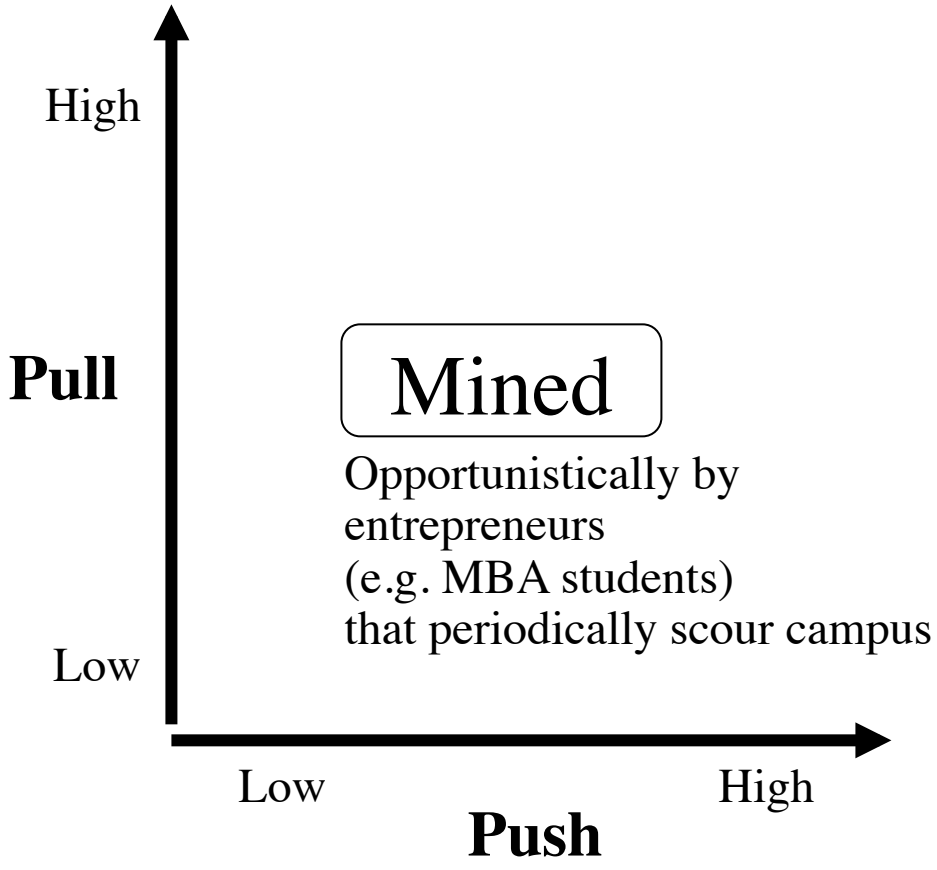


Commercialization: ***Morphed***, *Mined, Milked, Marketed*



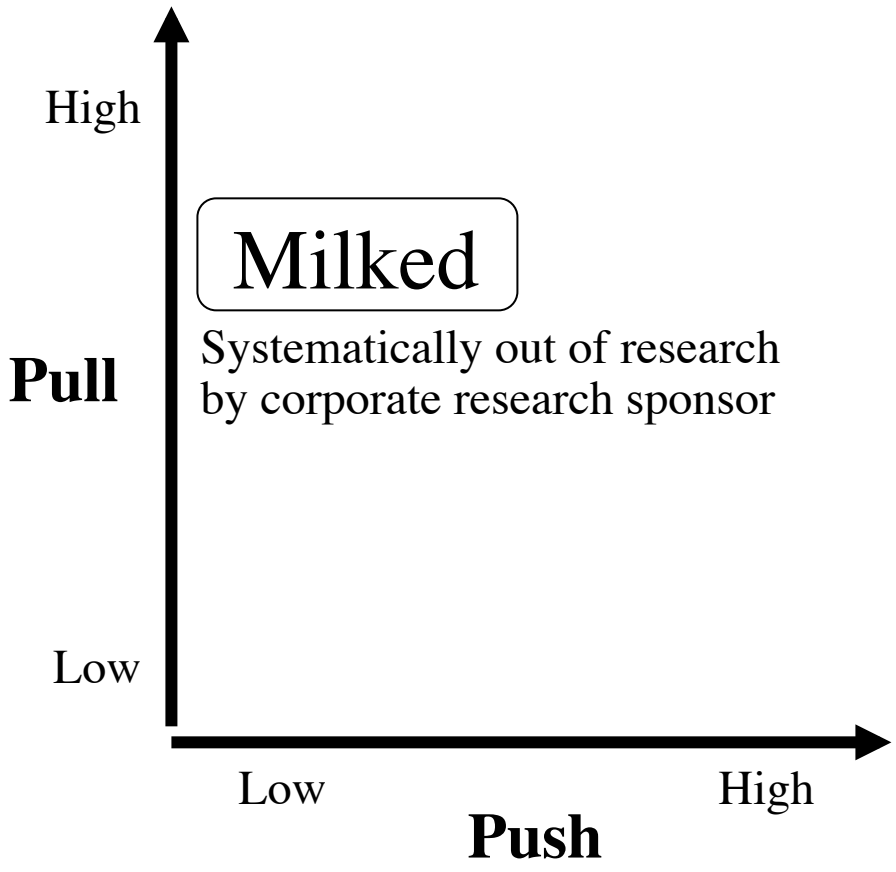
- Examples: Amyris, Calimetrics, CaliSolar, CellASIC, Chiron, Excellin, Fluxion Biosystems, GoodGuide (TaoIt), Harmonic Devices, Inktomi, Integrated Diag, IntelliOne, Kalinex, Lumiphore, Mercator Med (EndoBionics), MicroClimates (Aptility), MicroFluiDX, OnWafer, ON Diagnostics, PhotoSwitch Bioscience, Redwood Bioscience, SiClocks, TheraFuse, Urban Scan, Verimetra Med, Wireless Industrial Tech, Dust Networks, Iris AO, SiTime
- Drivers:
  - Great Research
  - Entrepreneurial culture & eco-system
- IP:
  - Some obtain exclusive license to improve biz plan & attract investors
  - Some ignore or abscond with IP

Commercialization: *Morphed,* ***Mined****, Milked, Marketed*



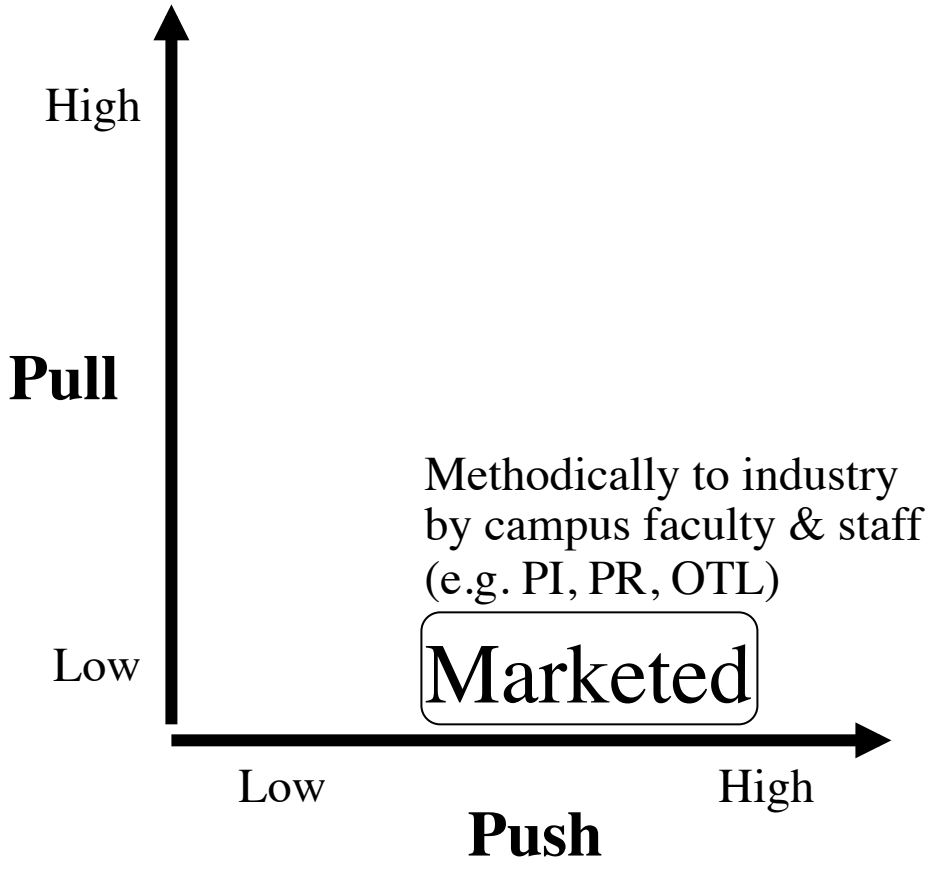
- Examples: Adura Tech, Aurora Biofuels, CommandCAD, Euclid Media, MediFuel, NanoRay, nanoPrint
- Drivers:
  - Great Research
  - MBAs, Biz plan comp, OTL mrktg
- IP:
  - Many obtain exclusive license to improve biz plan & attract investors
  - Some ignore or abscond with IP
- Comments:
  - Pathway with highest growth rate
  - MBAs are the campus's EIRs

Commercialization: *Morphed, Mined,* ***Milked****, Marketed*



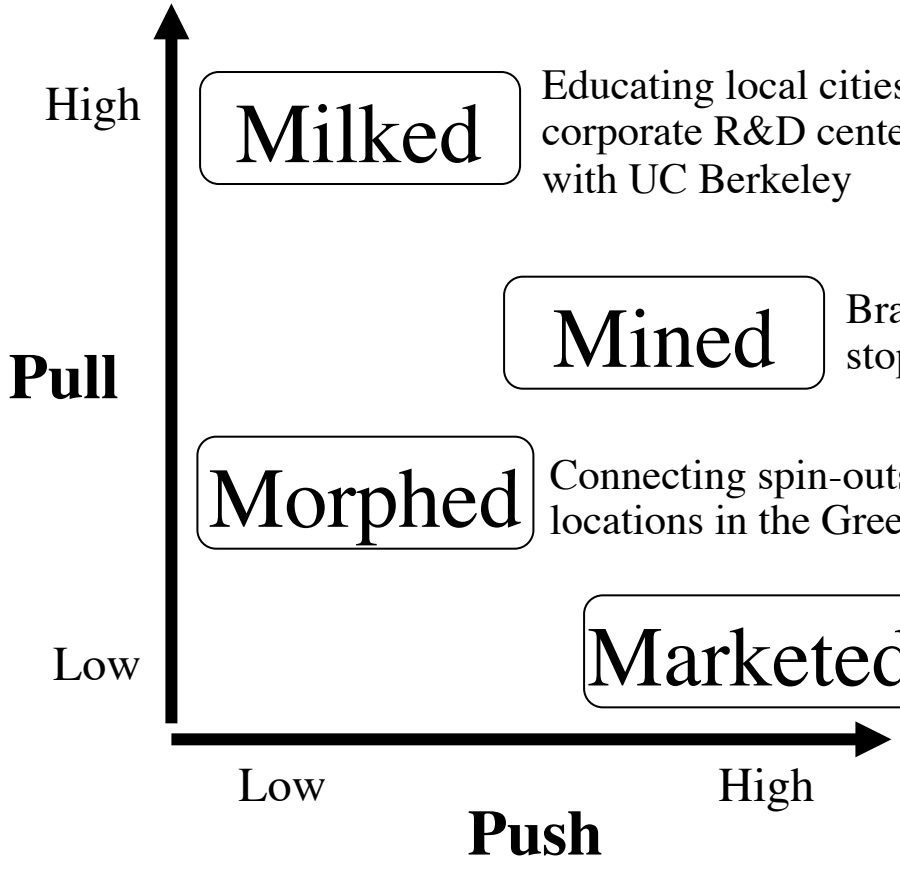
- Examples (*that licensed IP*): Analog Devices, Ecoprene (XL Tech), Google, Honeywell, Intel, Berkeley Bionics (first morphed then milked)
- Drivers:
  - Great sponsored research with optimized terms (i.e. 1st access, NERF, open source, etc)
  - Off-campus corporate labs (i.e. BWRC, Intel, Cadence, Yahoo, Starkey, etc)
- IP:
  - Some jointly own IP
  - Some obtain a license to legally use IP or thwart competitors
  - Some ignore or abscond with IP

Commercialization: *Morphed, Mined, Milked,* ***Marketed***



- Examples: Arkal Medical, Cisco, ClimateCooler, FuelFX, Luminus Devices, Honeywell, Microchip Biotech, Renovis, Silicon Basis, Solexel, Vitesse, 3M
- Drivers:
  - Great Research
  - Marketing (i.e. IP Licensing offices, University PR programs, Faculty pubs & ppts, Patent pubs, etc)
- IP:
  - Most obtain exclusive license to stay legal, improve BP, attract investment, or thwart competitors
  - Some ignore IP or abscond with IP
- Comments: Didn't get *morphed*, *milked* or *mined* because tech or market too nascent when invented

Examples of UCB Approaches via Tech Comm Office: *Integrate EB Green Corridor into 4Ms*



Milked — Educating local cities & developers on opportunities for local corporate R&D centers driven by corporate research collaborations with UC Berkeley

Mined — Branding the EB Green Corridor website as the 1-stop place to go for start-up space & resources

Morphed — Connecting spin-outs & EB Green Corridor contacts to find optimal locations in the Green Corridor

Marketed — Advocating for a "constellation" of startup housing, and also the *Berkeley Center for Emerging Growth Companies* that is **ADJACENT TO CAMPUS**

Also: Advocating for EB Green Corridor partners to formalize policy to be early adopters of new, local green products

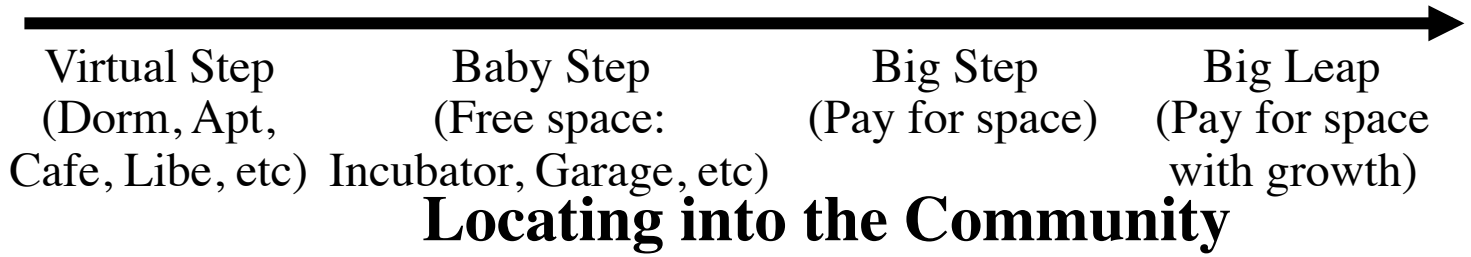
Univ Role in Driving Regional Green Economy

- Key points
  - Potential for univ-driven econ dev: squander vs leverage
  - 4M university pathways: *morphed*, *mined*, *milked*, *marketed*
  - EB Green Corridor is an approach to univ-driven econ dev

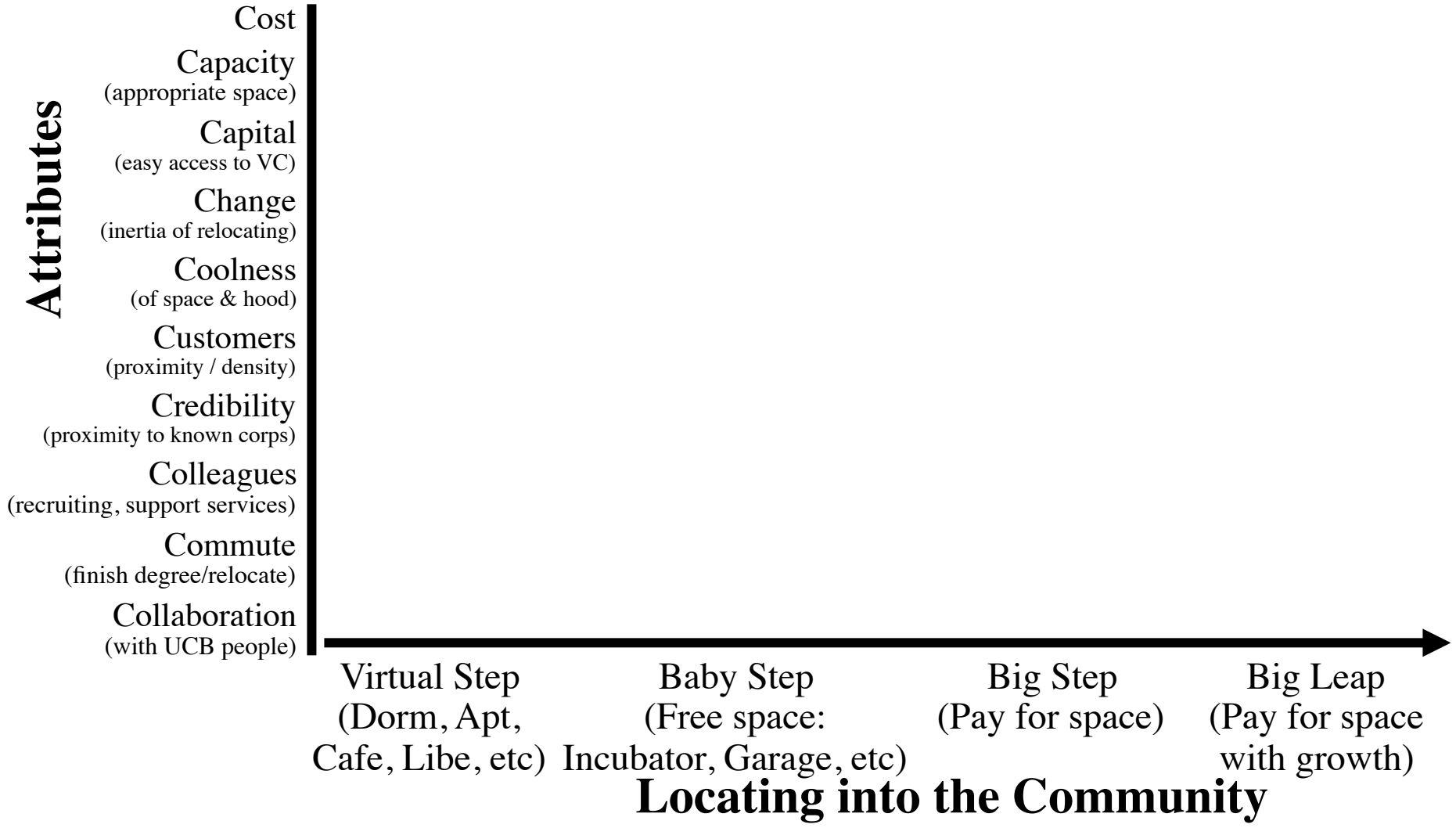
- Follow up
  - http://IPIRA.berkeley.edu
  - Michael Cohen; mcohen@berkeley.edu

Locating: *4 Steps* Into Community*

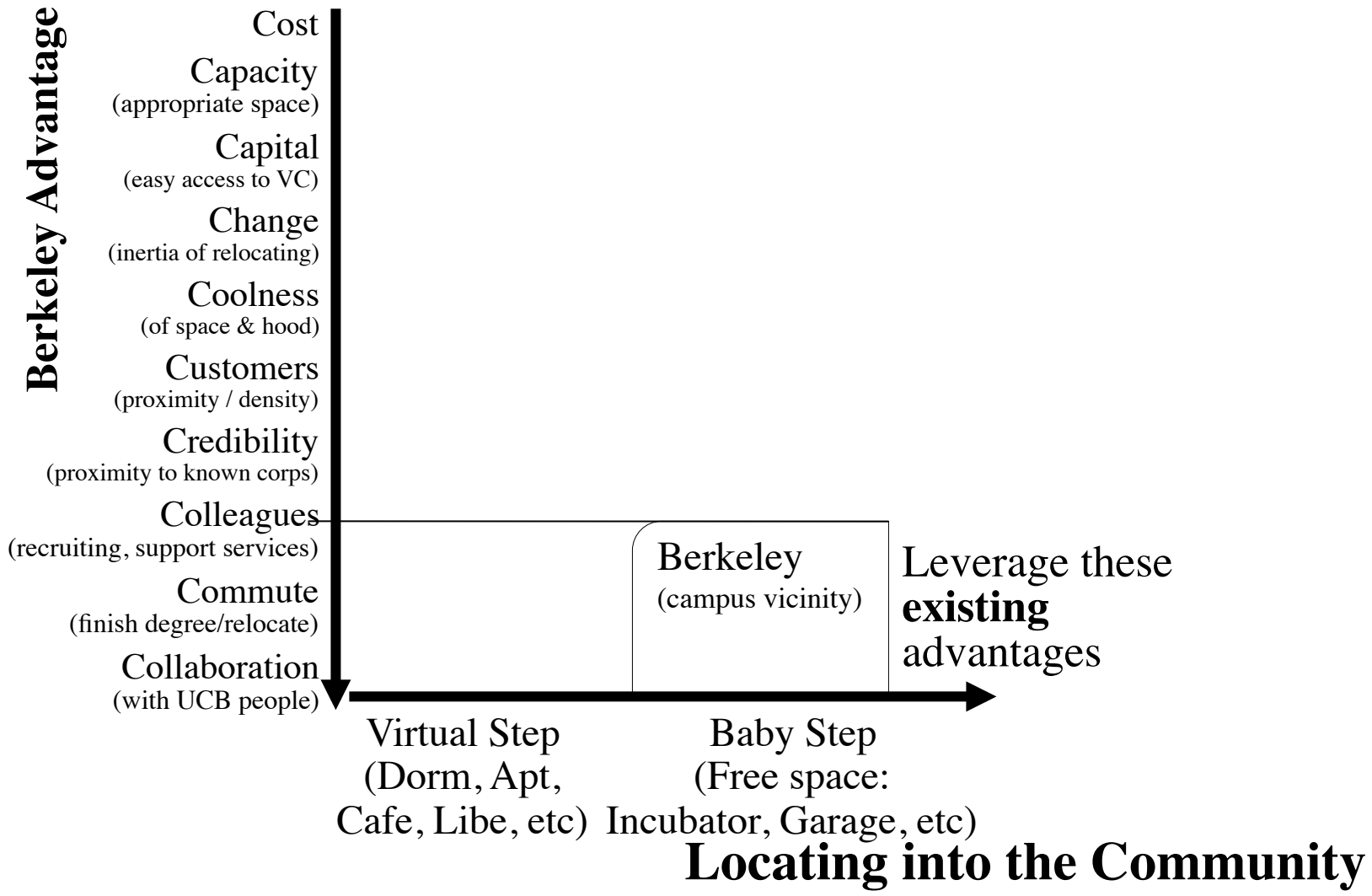
* Simplified Model



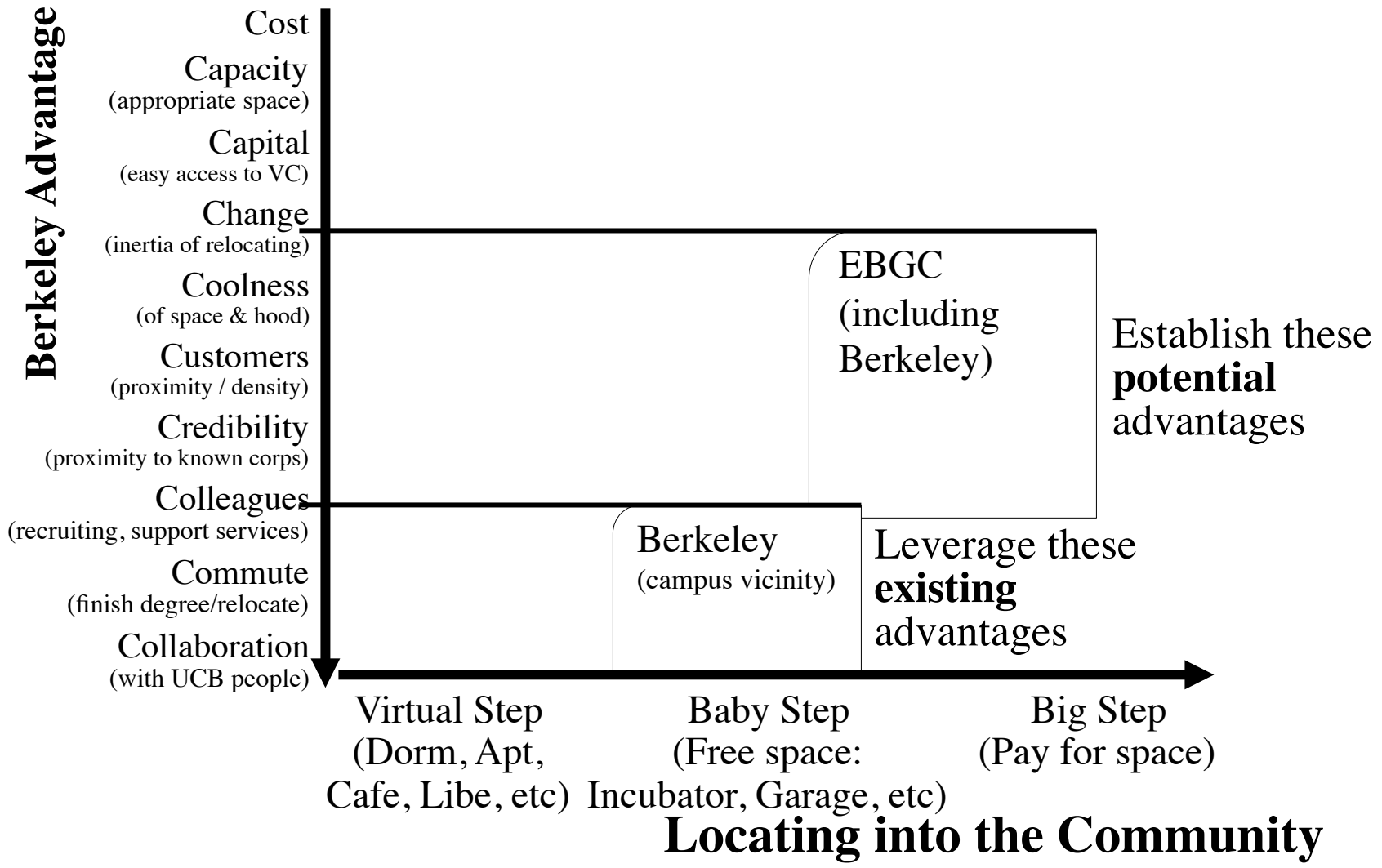
Locating: *Competitive Attributes*



Locating: *Baby Steps*



Locating: *Big Step*



Locating: *Big Leap*