Promoting Innovation to Foster Economic Development and Growth

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Innovation and Competition

- Influential literature linking innovation to competition, and economic growth
  - Significance of issues
    - Social welfare, overall innovation, future productivity, competitive advantage, development and growth
  - Optimal structure of markets, from an innovation perspective
Theory: Innovation and Competition

- Schumpeter (1942)
  - Innovation increases as markets become less competitive
- Arrow (1962)
  - Innovation decreases as markets become more competitive
- Aghion et al. (2005)
  - Highest innovation at intermediate levels of competition
- No clear theory result from oligopoly models with strategic interaction among firms
  - Aghion (2005) provides critical insights
Empirical: Competition and Innovation

- Survey by Cohen and Levin (1989)
  - More studies find innovation increasing as competition decreases
- Blundell et al. (1999)
  - More competition stimulates innovation
- Hall and Ziedonis (2001)
  - Semiconductor firms’ patenting increase with tighter IPR and infringement policy, and competition
- Hall et al. (2012)
  - Existing firms’ patent portfolios increase with competition
- Aghion et al. (2005) find intermediate levels of competition promotes innovation
- Overall, mixed findings
Aghion and Griffith (2008)

“While competition features prominently in the history of economic thought, it is fair to say that economists still have a limited, and sometimes contradictory, understanding of its economic effects and, in particular, of the relationship between competition and growth.”

They examine tradeoffs between successful innovations (with possible monopoly power) and enhancing competitive pressures on firms to push the frontier.

Aghion et al. (2005) provide important insight

Intermediate levels of competition may generate more innovation, and may be optimal for longer-run growth and welfare gains.
Competition, Innovation, Growth

Competition

• Competition (and regulatory) policy and enforcement can address issues about optimal interventions
  ○ Mergers, Cartels, and Dominance/Monopolization

• Policies to promote entrepreneurship and firm-growth
  ○ SME financing – perhaps weighted towards targeted innovative areas
  ○ World Bank and OECD initiatives: reduce entry costs and barriers
  ○ OECD: use Competition Assessment Toolkit to minimize regulatory barriers to competition

• Need multifaceted and coordinated set of initiatives and policies to clean up markets and promote entrepreneurship and competition in developing economies

Competition, Innovation, Growth

Innovation

Significant initiatives, policies and institutions are needed to stimulate innovation in developing economies

- Without this, domestic innovation will suffer, retarding growth and development in the longer run
• IPR – Umbrella policy and institutional aspect
  o IPR essential, as lack of it will retard *domestic* innovation
  o *Local* entrepreneurs and innovators need IPR protection as this provides them incentive to innovate
  o Optimal IPR protection period can be debated
  o Need well structured IPR *infringement* system to protect innovators and entrepreneurs
Generating Innovation
Incubators and Accelerators

- Incubators
  - External management team to manage idea, focus on job creation, professional services, training, networking, venture capital financing, utilization of specific technologies

- Accelerators
  - Can be advanced stage incubator assisting mature entrepreneurial firms, or hybrid incubation programs designed for firms to enter (foreign) market. Characteristics of accelerators include competitive applications process, pre-seed investments, limited-duration, intensive mentoring

<table>
<thead>
<tr>
<th></th>
<th>Incubators</th>
<th>Accelerators</th>
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</thead>
<tbody>
<tr>
<td>Duration</td>
<td>1 to 5 years</td>
<td>3 months</td>
</tr>
<tr>
<td>Business Model</td>
<td>Rent; non-profit</td>
<td>Investment, can be non-profit</td>
</tr>
<tr>
<td>Selection</td>
<td>Non-competitive</td>
<td>Competitive, cyclical</td>
</tr>
<tr>
<td>Venture Stage</td>
<td>Early, or late</td>
<td>Early</td>
</tr>
<tr>
<td>Mentorship</td>
<td>Minimal, tactical</td>
<td>Intense, by self and others</td>
</tr>
<tr>
<td>Venture location</td>
<td>On site</td>
<td>On site</td>
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Generating Innovation
Incubators and Accelerators

- Are multifaceted organizational forms to meet specific needs

- Can be private, public, or public-private partnership (PPP)
  - Developing economies – potentially important role of Government in later two, but also important to facilitate/incentivise former
  - International evidence points to private being more successful overall
    - Reasons: less administrative, oversight and project content inefficiencies
Generating Innovation
University-Based Initiatives

- Important in the overall strategy of organic development of technologies and fostering innovation
  - Universities can generate enormous knowledge/innovations
  - Harness via science parks and incubators
  - Incentivise researchers/faculty in STEM areas to participate in innovation and entrepreneurial processes
  - Will facilitate local generation of innovation and entrepreneurship in developing economies

STEM: Science, Technology, Engineering, Mathematics.
### Generating Innovation

#### University-Based Initiatives: Examples

<table>
<thead>
<tr>
<th>Name (Type, Start Year)</th>
<th>Country</th>
<th>Institution(s)</th>
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<tbody>
<tr>
<td>IncubaUC (UBI, 2002)</td>
<td>Chile-Santiago</td>
<td>Pontifical Catholic University of Chile</td>
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<tr>
<td>Industry Accelerator &amp; Patent Strategy (UBI, 2013)</td>
<td>Taiwan-Hsinchu</td>
<td>National Chiao Tung University</td>
</tr>
<tr>
<td>Instituto Genesis PUC-Rio (UBI, 1997)</td>
<td>Brazil-Rio</td>
<td>Pontifical Catholic University of Rio de Janeiro</td>
</tr>
<tr>
<td>HUST Science Park Development Corp. (UBI, 2001)</td>
<td>China-Wuhan</td>
<td>Huazhong University of Science and Technology</td>
</tr>
<tr>
<td>NDRC (UBI, 2008)</td>
<td>Ireland-Dublin</td>
<td>Dublin City University; Dún Laoghaire Institute of Art, Design and Technology; National College of Art and Design; Trinity College Dublin; University College Dublin</td>
</tr>
<tr>
<td>Chrysalis (UBI, 2012)</td>
<td>Chile-Valparaiso</td>
<td>Pontifica Catholic University of Valparaiso</td>
</tr>
<tr>
<td>National Chiao Tung University (UBI, 1998)</td>
<td>Taiwan-Hsinchu</td>
<td>National Chiao Tung University</td>
</tr>
<tr>
<td>Hub China (UABI, 2013)</td>
<td>China-Beijing</td>
<td>Capital Normal University; Beijing Technology and Business University; North China University of Technology</td>
</tr>
<tr>
<td>Nanotechnology Incubator (UABI, 2005)</td>
<td>Mexico-Monterrey</td>
<td>Instituto de Innovación y Transferencia de Tecnología de Nuevo León</td>
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Generating Innovation
Other Initiatives

- Standard policy basket includes, for example:
  - R&D tax credits – perhaps emphasising specific innovation areas
  - Early-stage funding – directed towards targeted innovation areas
    - E.g., Biosciences, energy – can be tailored to domestic needs
Innovation fundamental to long-run growth and development

Need two-pronged strategy to maximize innovation output

- Broad-based policies related to IPR, IPR-infringement, R&D tax credits, early-stage funding, among others
- Focused and targeted policies and initiatives
  - University-based development and commercialisation of innovation
  - Private, public and PPP incubators
  - Identification of targeted areas of innovation based on domestic needs and domestic resource base

Institutions, initiatives and policies need to be developed for the long-haul as myopic approach to generating innovation not likely to succeed