Assessing Regional Innovative Entrepreneurship Ecosystems with the Global Entrepreneurship And Development Index: THE CASE OF SCOTLAND

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Clusters are particularly powerful drivers of economic performance when they leverage regional innovative and entrepreneurial capacity.

- These three elements combined are the foundations for regional innovation-based entrepreneurship.
- They are enhanced by the strength and number of connections among them.
Components of an Innovation-based entrepreneurial ecosystem

Need for comparative measures of:
- People - Entrepreneurs
- Funding
- Infrastructure
- Policy
- Culture -> Rewards & Norms
- Demand

This is a complex set of interacting individual and institutional variables
Team Scotland chose Individual Data
- Global Entrepreneurship Monitor (4 year average 08-11)

Institutional Data (latest available)
- United Nations Population Division
- World Economic Forum Global Competitiveness Index
- World Bank Doing Business
- IESE Ernst & Young PE/VC Attractiveness Index
- Transparency International: Corruption Perception Index
- Global Telecommunications Union: Internet usage
- Trading Safely Country Risk rate
- Etc.....
Boldly going beyond

…..and even beyond the triple helix

- We adopted a “Collective Impact” approach to policy formulation and implementation
- Getting stakeholder buy-in is critical
- Government cannot do it on its own
- A common agenda, shared measurement systems, mutually reinforcing activities, continuous communication, and the presence of a backbone organization.
Process model of assessment of a regional innovation-driven entrepreneurial ecosystem

- Locate regional measures of GEDI variables
- Establish national or regional benchmarks for the region
- Relative and absolute comparison with benchmarks
- Sensitivity analysis to elicit a bottleneck configuration
- Validity test of bottleneck pillars
- Group bottlenecks under themes
- Engage with 10-15 stakeholders per theme to assess face validity of bottlenecks/ uncover underlying causes
- Smaller high level task groups of stakeholders focused on solutions to bottlenecks/ underlying causes
- Simulate possible policy option effects using GEDI model
- Develop cost-benefit analysis of policy options
## Scotland vs 27 Innovation-Driven Countries

<table>
<thead>
<tr>
<th>Institutional Variable</th>
<th>Individual Variable</th>
<th>Pillars</th>
<th>Scotland Rank (27 innovation-driven countries)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Agglomeration</td>
<td>Opportunity Perception</td>
<td>Opportunity Perception</td>
<td>347</td>
</tr>
<tr>
<td>Education PostSec</td>
<td>Skill Perception</td>
<td>Start-up Skills</td>
<td>401</td>
</tr>
<tr>
<td>Business Risk</td>
<td>Nonfear of Failure</td>
<td>NonFear of Failure</td>
<td>555</td>
</tr>
<tr>
<td>Internet Usage</td>
<td>Know Entrepreneurs</td>
<td>Networking</td>
<td>403</td>
</tr>
<tr>
<td>Corruption</td>
<td>Career Status</td>
<td>Cultural Support</td>
<td>585</td>
</tr>
<tr>
<td>Economic Freedom</td>
<td>TEA_Opportunity</td>
<td>Opportunity Startup</td>
<td>573</td>
</tr>
<tr>
<td>Tech_Absorption</td>
<td>TEA_Technology</td>
<td>Tech Sector</td>
<td>683</td>
</tr>
<tr>
<td>Staff Training</td>
<td>TEA_Education</td>
<td>Quality of Human Resources</td>
<td>554</td>
</tr>
<tr>
<td>Domestic Market</td>
<td>TEA_Competition</td>
<td>Competition</td>
<td>644</td>
</tr>
<tr>
<td>Technology Transfer</td>
<td>TEA_NewProduct</td>
<td>Product Innovation</td>
<td>446</td>
</tr>
<tr>
<td>GERD</td>
<td>TEA_NewTech</td>
<td>Process Innovation</td>
<td>421</td>
</tr>
<tr>
<td>Business Strategy</td>
<td>TEA_Gazelle</td>
<td>High Growth</td>
<td>453</td>
</tr>
<tr>
<td>Globalisation</td>
<td>TEA_Export</td>
<td>Internationalisation</td>
<td>487</td>
</tr>
<tr>
<td>Venture Capital</td>
<td>Informal Investment</td>
<td>Risk Capital</td>
<td>384</td>
</tr>
</tbody>
</table>

Australia: Germany: Italy: Scotland: Switzerland
Belgium: Greece: Japan: Singapore: Taiwan
Czech Republic: Hong Kong: Korea: Slovenia: UAE
Denmark: Iceland: Netherlands: Spain: United Kingdom
Finland: Ireland: Norway: Sweden: United States
France: Israel: Portugal

* Global Competitiveness Index definition
Scotland vs 27 innovation-driven countries including UK
Scotland versus Innovation-Driven Nations Summary

- Opportunity Perception (Attitudes)
  - Lower Quartile: 0.9
  - Median: 0.8
  - Upper Quartile: 0.7

- Risk Capital (Aspirations)
  - Lower Quartile: 0.6
  - Median: 0.5
  - Upper Quartile: 0.4

- Internationalisation (Aspirations)
  - Lower Quartile: 0.3
  - Median: 0.2
  - Upper Quartile: 0.1

- High Growth (Aspirations)
  - Lower Quartile: 0.4
  - Median: 0.3
  - Upper Quartile: 0.2

- Process Innovation (Aspirations)
  - Lower Quartile: 0.5
  - Median: 0.4
  - Upper Quartile: 0.3

- Product Innovation (Aspirations)
  - Lower Quartile: 0.6
  - Median: 0.5
  - Upper Quartile: 0.4

- Competition (Activity)
  - Lower Quartile: 0.7
  - Median: 0.6
  - Upper Quartile: 0.5

- Tech Sector (Activity)
  - Lower Quartile: 0.8
  - Median: 0.7
  - Upper Quartile: 0.6

- Quality of Human Resources (Activity)
  - Lower Quartile: 0.9
  - Median: 0.8
  - Upper Quartile: 0.7

- Startup Skills (Attitudes)
  - Lower Quartile: 0.9
  - Median: 0.8
  - Upper Quartile: 0.7

- NonFear of Failure (Attitudes)
  - Lower Quartile: 0.9
  - Median: 0.8
  - Upper Quartile: 0.7

- Networking (Attitudes)
  - Lower Quartile: 0.9
  - Median: 0.8
  - Upper Quartile: 0.7

- Cultural Support (Attitudes)
  - Lower Quartile: 0.9
  - Median: 0.8
  - Upper Quartile: 0.7
Sensitivity analysis: What is the optimum additional allocation of policy effort for a 20% improvement in Scotland’s GEDI score?

<table>
<thead>
<tr>
<th></th>
<th>Scotland</th>
<th>Wales</th>
<th>N. Ireland</th>
<th>England</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opportunity Perception</strong></td>
<td>13%</td>
<td>21%</td>
<td>24%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Startup Skills</strong></td>
<td>11%</td>
<td>11%</td>
<td>13%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td><strong>NonFear of Failure</strong></td>
<td>4%</td>
<td>3%</td>
<td>6%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Networking</strong></td>
<td>11%</td>
<td>11%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Cultural Support</strong></td>
<td>3%</td>
<td>0%</td>
<td>0%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Opportunity Startup</strong></td>
<td>4%</td>
<td>3%</td>
<td>1%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Tech Sector</strong></td>
<td>0%</td>
<td>6%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Quality of Human Resources</strong></td>
<td>4%</td>
<td>3%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Competition</strong></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Product Innovation</strong></td>
<td>9%</td>
<td>9%</td>
<td>6%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Process Innovation</strong></td>
<td>11%</td>
<td>11%</td>
<td>13%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td><strong>High Growth</strong></td>
<td>9%</td>
<td>6%</td>
<td>7%</td>
<td>11%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Internationalisation</strong></td>
<td>7%</td>
<td>6%</td>
<td>4%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Risk Capital</strong></td>
<td>12%</td>
<td>11%</td>
<td>12%</td>
<td>13%</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Result: almost 50% of additional allocation should be focused on Aspiration pillars, with another 35% on three Attitudes pillars, assuming equal costs of improvement per pillar.
Issues arising from further inspection of bottleneck pillars, in order of impact on improvement in the GEDI Index

Opportunity perception (13%): Low prevalence of opportunity perception.

Risk Capital (12%): Low prevalence of informal investment activity (not necessarily business angel activity).

Start-up Skills (11%): Low levels of current enrolment in post-secondary education and low prevalence of self-perceived start-up skills.

Networking (11%): Low levels of internet access and lack of contact with early-stage entrepreneurs.

Process innovation (11%): Low levels of R&D spend by business, particularly smaller businesses, and low prevalence of use of new technology by new businesses.

Product innovation (9%): As above

High growth (9%): Low prevalence of ambitious stage entrepreneurs.

Internationalisation (7%): Low prevalence of export-oriented entrepreneurs and low level of globalisation
Validation of sensitivity analysis with 4 stakeholder groups of 12 to 15 experts, two pillars discussed by each group over 3 hours

Results (Summary of 23 page summary report of meeting transcripts)

Repeating themes of weaknesses (causes) that may underlie the combination of bottlenecks (symptoms):

1. **Networking** and networks (67 mentions),
2. Business, management and commercial **skills** (28 mentions) and in particular sales and selling skills (21 mentions),
3. Global outlook (10 mentions) and the need to **connect** with other cultures (11 mentions),
4. The (under-) contribution of Scottish **universities** (12 mentions),
5. Mentors (12 mentions), **role models** (8 mentions),
6. **Access** to markets (4 mentions) and finance (12 mentions) including those outside Scotland,
7. **Exits** for formal and informal venture capital(4)
Reduction of themes to a small number of underlying causes in an all day team meeting

1. Exits for investors
2. Effective connections
3. Skills for growth
4. Role of universities
5. Role models/positive messages
Current status

• High level Task Groups have been charged with developing solutions to each of the five themes
• “Collective impact” or Team Scotland approach
• Each individual in each group commits themselves and their organisations to specific, measurable actions.

Example from the university group
..\MBA\S100promo.zip

We are now pulling together an overall strategy document that summarises the vision and how, using collective impact, we will get there.
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