Challenges for technology and innovation policy: Observations from a development perspective

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Definitions and assumptions

- Innovation: turning knowledge into value
- Innovation central to economic development
- Active policy is required if DCs are to catch-up
- Macroeconomic importance but primarily occurs in firms
- Outcome of complex and dynamic interactions
- Innovation policy is a set of interlocking policies
UNCTAD STI Policy Reviews

• Since 2010: 8 national STI Policy reviews
  (Mauritania, Angola, Lesotho, Peru, El Salvador, Dominican Republic, Oman and Thailand)

• National Systems of Innovation – NSI

• Sum of interactions among firms, government, academia and society at large that result in innovation

• Challenges in implementing policies for NSI

• Common problems face many developing countries but no two countries are the same
Global innovation indicators

- A need to measure and assess policy outcomes
- Traditional metrics of inputs are insufficient
- Modest performance of NSI in the Middle East
- Evidence-based policymaking
Framework conditions

- Variations in innovation performance - differences in how STI stakeholders interact within framework conditions
- Many framework conditions can be influenced by policy
  - Governance
  - Macroeconomy, business environment and infrastructure
  - Diversification
  - Human capital, education, scientific and R&D capabilities
Framework conditions: Governance

• Leadership, social dialogue, consensus-building

• Capacity and competency to legislate

• Horizontal consultations, communications
  - Old guard at odds with increasingly networked nature of knowledge flows, unnecessarily act as information gatekeepers

• Government online presence, social media, public and administrative services, procurement policies and activities
Framework conditions: Macroeconomy

- Labor market, symptoms of dysfunction
- Dutch disease, decline in international competitiveness
- Structure of productive sector, number and size of SMEs and very large firms; imbalances disfavor innovation
- Anti-trust and competition law and authorities
- Intellectual property rights support
- Infrastructure: transport, energy, ICT, broadband
- Entrepreneurship culture, attitude toward risk, uncertainty
Framework conditions: Diversification

- Undiversified development is inherently risky, volatile
- Do not generate sufficient employment opportunities
- Employment opportunities that a technology-based diversification process can generate may be also limited
- Expectations of conditions of employment, social services, education, leisure and retirement, will also change
Framework conditions: Human capital

• Human capacity policies focus on education
• Qualitative and quantitative assessment of education
• Standards & assessment of teachers, principals, supervisors
• Primary concern: match the output of the education system and the requirements of the labor market, firms, industry
  - Job prospects for after vocational training (instead of academic education)
  - Reduce enrollement for social studies, liberal arts, humanities disciplines
• Low R&D spending as % of GDP = low innovation
• Raising R&D spending in isolation may not work
Key interactions:  
Business, academia and government  

• Interactions in the innovation system are fragmented  
  o Cooperation is uneven, research bodies are small, difficulties scaling up, problems working with the private sector, clustering processes are nascent  

• Large firms have innovative capacities but few incentives  

• Very few, if any, spin-off businesses  

• Interactions with academia and R&D institutions is modest  

• Technology transfer occurs through JV or FDI, or through trade: by purchasing capital equipment.
Key interactions: Business, academia and government

• **Policy actions:** Improved coordination between:
  - Authorities in charge of technology parks and industrial estates
  - Investment promotion and export development
  - Ministries charged with economic development and commerce
  - Institutions representing SMEs and firms such as business associations or chambers of commerce.

• **Regional cooperation - technology transfer**

• **Common good use of regional laboratory and testing facilities, and facilities for prototyping**
Key interactions: Business, academia and government

• Higher education policy faces a number of challenges:
  o Do students have the required level of language and math competence?
  o What is the incentive environment in academic establishments?
  o Is there a coordination framework for cooperation, how open is the practice?
  o Do intellectual property rules and regulations and support structures provide incentives to extend cooperation outside the institution?
  o Are academic research themes and projects aiming at having research results published as the ultimate validation?

• Deep disconnect between academic research programmes and innovation needs in industry.
Challenges for technology and innovation policy

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- Key governance challenge: Improve coordination in the development and conduct of STI policies
- Speed up implementation at the strategic and at the level of individual programme actions
- Changing the social and cultural perception of risk and the negative connotation of entrepreneurial failure
- Direct and indirect financial support for innovation
- Innovation policy needs to be evidence-based
Conclusions

• Innovation policy, as a component of development policy needs to be based on three key pillars:
  1. Innovation policy should build on a mix of global knowledge and technologies and national competencies, culture and identity
  2. Innovation policy is an expression of political determination that should inspire all sectors of the economy and society
  3. Sustainable development is an imperative

• Strong coordination, leadership from the highest instances of government

• High-level coordination must not devolve into discussion clubs which cannot implement horizontal policies
Conclusions:

- Conducting an institutional audit
- Identify regulatory, legal and behavioral obstacles to innovation, remove them in a decisive manner.
- Leveraging public procurement, infrastructure
- Assist SMEs, stimulate youth creativity, entrepreneurship
- Develop creativity of children early on in schools
- Policymakers need to significantly upgrade their determination and capacity to communicate in a clear and positive manner in order to convey what is at stake
- Developing an NSI is a change of mindset and outlook