INNOVATION PERFORMANCE REVIEW OF ARMENIA

Selected Conclusions and Recommendations from Chapters 2, 4 and 6

Presentation by Rumen Dobrinsky
European Alliance for Innovation

Policy Workshop
Innovation Performance Review of Armenia
Yerevan, 14 November 2014
Methodological approach and the concept of National Innovation Systems

Chapter 2. The national innovation system of Armenia and innovation governance

Chapter 4. Knowledge generation and absorption

Chapter 6: Financing innovative entrepreneurs
Methodological approach and the concept of National Innovation Systems
Innovation in the modern economy

• Innovation is a broad concept and a highly complex phenomenon
• Requires a combination of different types of knowledge: pre-existing in companies; resulting from new R&D; generated through networking; supplied by markets or users; borrowed from competitors
• Involves the interactions of many “actors” (stakeholders): academic and R&D institutions, firms, public bodies, financiers, users, etc.
• Innovation is a process with highly uncertain outcomes: therefore there is a need to commit resources to reduce uncertainty
The National Innovation System (NIS)

- **NIS**: the network of institutions in the public and private sectors whose activities and interactions initiate and diffuse new technologies and products

- **NIS agents**: knowledge institutions (universities, research institutes, technology-providing firms), firms and government bodies

- The **interactions and linkages** between the elements of the NIS are also part of the system

- The **flows of ideas and knowledge**, as well as the **ability to learn** are also part of the NIS
The NIS of a small open economy

Market demand:
Domestic and international consumers, producers

International business subsystem:
Firms; intermediaries

Domestic business subsystem:
Large firms, SMEs, Startups

Innovation infrastructure/intermediaries:
High-tech, science and technoparks, technology transfer and innovation centres, venture capital, business angels, incubators, consultancy firms, others

R&D/education subsystem:
General education and training
Higher Education
R&D institutes

Environment; Framework conditions:
Financial and information systems, business infrastructure, standards, IPR rules, laws and regulations, taxation, strategies and policies
Chapter 2. The national innovation system of Armenia and innovation governance
### Key programmatic and legislative measures

<table>
<thead>
<tr>
<th>Laws, programmes, resolutions</th>
<th>Policy-making body</th>
<th>Implementing agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Decree N282 of 19 March 2002 on the establishment of &quot;Small and Medium Entrepreneurship Development National Center of Armenia&quot;</td>
<td>Ministry of Economy</td>
<td>SME DNC</td>
</tr>
<tr>
<td>Law on State Support to Innovation Activities, 2006</td>
<td>Ministry of Economy</td>
<td>Ministry of Economy</td>
</tr>
<tr>
<td>Government Resolution No. 1269, 18 October 2007, on the State Committee of Science</td>
<td>MES/SCS</td>
<td>SCS</td>
</tr>
<tr>
<td>Government Resolution of 2006 on optimization of the infrastructure of NAS RA</td>
<td>Government RA</td>
<td>NAS RA</td>
</tr>
<tr>
<td>Science and Technology Development Priorities for 2010-2014 (May, 2010)</td>
<td>MES/SCS</td>
<td>SCS</td>
</tr>
<tr>
<td>Law on the NAS RA (2011)</td>
<td>MES/SCS</td>
<td>NAS RA</td>
</tr>
<tr>
<td>Concept Paper on the Initial Strategy of the Formation of Innovation Economy, 2011</td>
<td>Ministry of Economy</td>
<td>EIF, National Center of Innovation and Entrepreneurship</td>
</tr>
</tbody>
</table>
Innovation Governance System of Armenia

Strategy on the Development of Science, 2011-2020 (SDS)

Initial Strategy of the Formation of Innovation Economy (ISFIE)

Strategy of Export-led Industrial Policy (SELIP)

Councils chaired by the Prime Minister of Armenia

National Academy of Science (NAS RA)

Ministry of Education and Science

State Committee of Sciences (SCS)

Ministry of Economy

Funding instruments

Research institutes

Implementing Agency

Firms

SDS outcomes

ISFIE outcomes

SELIP outcomes
The current state of the NIS

- A strong R&D and education sub-system
- Limited role of the domestic business subsystem (including finance)
- Weak/non-existing innovation intermediaries
- Important role of international linkages
- Many important NIS building blocks of mature market economies are either still weak or non-existent
- Disconnect in the governance of R&D and innovation activities in Armenia
- Fragmentation of governance
At present, a somewhat narrow interpretation of innovation prevails, focusing on frontier (cutting-edge) technological innovation.

This is reflected both in the innovation policy mix and in the efforts to support NIS formation and implementation.

As a result, a range of innovation-related activities are left out of the scope and coverage of the existing policy instruments.

This reduces the overall effectiveness of the policy efforts and does not support the establishment of a full-fledged and efficient NIS.
• Switch to broader understanding of innovation to include also non-technological aspects and technologies that may exist elsewhere but are new to the Armenian market as well as innovative processes and services.
  – Undertake an awareness raising campaign both among policy makers and other innovation stakeholders to promote a broader understanding of innovation;
  – Review critically the innovation strategy with a view to identifying the main gaps in the current orientation that result from the prevailing narrow view of innovation;
  – Develop an implementation plan for introducing supplementary components in the national innovation strategy and the related areas of innovation policy.
A number of building blocks and linkages that are vital for a well-functioning NIS are still non-existent.

The most critical among these gaps are the poor linkages between education/science/R&D and industry.

Innovation intermediaries and support institutions in the country are rather weak.

Early-stage financing is practically absent.

Further steps are needed to make the local environment conducive to innovative entrepreneurship.
Recommendation 2.2

- Undertake a policy effort to develop the building blocks and linkages that are currently missing in the NIS and are not targeted in the current strategic orientation.
  - Critical analysis of key missing components of the NIS and prioritize them in terms the efficient functioning of the NIS;
  - Devise a supplementary medium-term action plan for further institutional development of the NIS;
  - Design policy instruments targeting, specifically, the establishment and strengthening of now missing or weak linkages in the NIS;
  - Incorporate an international dimension when addressing existing weaknesses, in particular with regard to industry-science linkages, innovation intermediaries and early-stage financing while also promoting the integration of Armenian R&D institutes and businesses into global value and supply chains.
Systemic aspects of industry-science linkages

- Poor industry-science linkages constitute one of the weakest structural components of the Armenian NIS.
- The governance structure (a rift between SCS and ME) reinforces the disconnect between the two sub-sectors.
- This prevents Armenia to fully employ the potential of its strong science base in some areas.
Recommendation 2.3

- Undertake targeted policies to strengthen the industry-science linkages within the NIS both internally and across borders.
  - Design specialized policy instruments to support innovation projects covering the full innovation cycle from research to the market and which are conditional on collaboration between Armenian R&D institutes (including those within NAS RA) and local businesses;
  - Introduce initiatives that encourage collaborative R&D and innovation projects involving Armenian R&D institutes (including those within the NAS RA) and businesses from other countries. Discuss joint schemes for promoting innovation with potential foreign partners;
  - Design and put in place policy programmes jointly run by the SCS and the Ministry of the Economy to implement these instruments.
• There are too many bodies tasked with the implementation of different innovation support programmes, which often are very small
• The current role of the NAS in the national innovation governance system is somewhat ambiguous (reality does not match declared ambitions)
• Fragmentation is an impediment for conducting a coherent national innovation policy and for coordinating between the different governance bodies
• **Consider possible measures to streamline innovation governance structures.**
  
  – Develop options for the gradual merger of those implementation bodies currently under the functional responsibilities of the Ministry of the Economy;
  
  – Organise a public debate on the rationale of establishing a new public body governing both R&D and innovation which would take over the respective functions now undertaken by the SCS and the Ministry of the Economy;
  
  – Review the functional role of the NAS in the NIS in order to improve its integration within the governance of innovation activities and its participation the commercialization of research results.
Chapter 4. Knowledge generation and absorption
R&D expenditure is low ...

Gross expenditures on R&D as percent of GDP
... and is funded mainly from the state budget

Structure of expenditures on R&D by sources, in %
Summary of main conclusions

• Armenia’s development options are closely linked to the transition towards a knowledge-based economy (in view of the scarcity of natural resources and geographic position)

• The R&D expenditures for supporting innovation-based development are very low at present

• Skill mismatch: Armenia’s main asset is its skilled labour force; at the same time, companies encounter difficulties in finding qualified staff

• Low innovation demand does not create incentives for technological upgrading among companies

• The potential for FDI to contribute to innovation and technological change remains largely untapped
Recommendation 4.1

• The education system requires reforms that ensure the relevance of knowledge and its dissemination in the wider economy.
  – Modernizing curricula to ensure that the skills of graduates correspond to the needs of technologically-driven growth;
  – Improving teacher training, particularly in the higher education sector;
  – Differentiating between research and vocational universities, with specific objectives for each group; some R&D institutes could be integrated into research universities.
  – Strengthening linkages between vocational universities and the business sector, including foreign firms
• Undertake concerted actions to stimulate innovation activities in the country:
  – Increasing public R&D spending and encouraging higher spending in the business sector;
  – Harmonize R&D and innovation statistics with international standards;
  – Support to engineering and innovation management, including by facilitating the introduction of ISO standards;
  – Develop targeted policy measures to stimulate the demand for innovation:
    - Introducing innovation vouchers for the purchase of innovation services to encourage innovation activities in SMEs
    - Using public procurement as a mechanism to promote technological upgrading in the business sector
Introduce measures for better allocation of resources to R&D:

- Restructuring the system of R&D institutes; encouraging some of them to become technical institutes supporting knowledge-intensive SMEs;
- Stimulate the channelling of private funds towards R&D institutes and encourage cooperation with technoparks;
- Modernize the system of evaluation of R&D institutes and align with national priorities;
- Introducing international evaluation of key R&D organizations
Encourage positive spillover and increase the impact of FDI on technological upgrading:

- Introduce instruments integrating FDI and innovation policy to promote a shift towards FDI in technology, engineering and business support service centres (this requires coordination between the agencies involved in policy design and delivery in these areas);

- Develop a programme to promote subcontracting as part of FDI support, so that foreign companies incorporate Armenian suppliers in their value chains.
Chapter 6. Financing innovative entrepreneurs
## Divergent trends in SME financing

### Guarantees for SME loans

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start-ups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guarantee value (mil. ADM)</td>
<td>5.0</td>
<td>30.2</td>
<td>44.8</td>
<td>109.4</td>
<td>53.5</td>
<td>37.4</td>
<td>268.4</td>
</tr>
<tr>
<td>Loan value (mil. ADM)</td>
<td>4.3</td>
<td>25.3</td>
<td>37.4</td>
<td>91.5</td>
<td>44.8</td>
<td>31.2</td>
<td>262.6</td>
</tr>
<tr>
<td>Number of funded plans</td>
<td>6</td>
<td>35</td>
<td>41</td>
<td>65</td>
<td>30</td>
<td>17</td>
<td>120</td>
</tr>
<tr>
<td><strong>Existing SMEs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guarantee value (mil. ADM)</td>
<td>342.2</td>
<td>375.7</td>
<td>213</td>
<td>246.5</td>
<td>63.5</td>
<td>52.1</td>
<td>179</td>
</tr>
<tr>
<td>Loan value (mil. ADM)</td>
<td>628.1</td>
<td>722.7</td>
<td>391.1</td>
<td>435.2</td>
<td>136.3</td>
<td>90.9</td>
<td>315.5</td>
</tr>
<tr>
<td>Number of funded companies</td>
<td>87</td>
<td>94</td>
<td>56</td>
<td>57</td>
<td>13</td>
<td>11</td>
<td>30</td>
</tr>
</tbody>
</table>
Summary of main conclusions

• Good conditions for doing business: relatively high ranking in the World Bank *Doing Business* reports

• However, the supply of financial services and instruments – and financial intermediation in general – is quite low

• The banking sector in Armenia is small and fragmented: domestic credit accounts for 38.6% (2012)

• Various programmes to support innovative entrepreneurship

• … including several initiatives with international participation

• … and emphasis on the role of diaspora

• However, limited coordination between initiatives
Recommendation 6.1

- Better information sharing and coordination regarding entrepreneurship support initiatives:
  - Introduce robust impact evaluation methodologies to assess support initiatives;
  - Identify success factors of initiatives and share good practices across agencies;
  - Develop information and awareness raising campaigns, with the participation and support of other stakeholders;
  - Joining the Global Entrepreneurship Monitor surveys to facilitate cross-border sharing of good practices
• **Strengthen public efforts to provide a strategic orientation for entrepreneurship support:**

  – Define strategic targets, which are regularly evaluated and updated;

  – Involve key stakeholders (incl. beneficiaries and other sources of expertise, such as the diaspora) in the elaboration of the strategic orientation;

  – Set up a body with clear responsibilities and competencies for implementing and monitoring of the strategy;

  – Identify synergies and complementarities among various support programmes and apply coordinated approaches to complement different programmes
Recommendation 6.3

• Explore further ways to tap into the potential of the diaspora to support innovative entrepreneurship:
  – Conduct awareness and information campaigns targeting the diaspora on national support programmes as sources of business opportunities;
  – Develop a framework for business angel financing targeting the attraction of cross-border financial flows, incl. from the diaspora;
  – Engage the diaspora in the design and implementation of mentoring and coaching schemes for entrepreneurs, incl. those in educational and research organizations
Thank you!

Rumen Dobrinsky
E-mail: rumen.dobrinsky@eai.eu
rumen.dobrinsky@gmail.com