Effects of Reversing Brain Drain in Developing Countries and Scientific Human Capital Policies for a Better Investment Climate

Zeynep Esra Tanyildiz
Outline

• New dynamics
• Immigrant entrepreneurs
• Impact of scientific human capital on financial climate
• Two special cases: India and Israel
• Rethinking scientific human capital
• Concluding remarks
Global Hunt for “Brains”

• The emerging knowledge economy has led to an increase of demand and locational competition for highly-skilled labor.

• New focus on human capital instead of physical capital indicates a paradigmatic shift in innovation policy and regional policy.

• Current sectoral or territorial innovation strategies are incomplete without some recommendations to increase the attraction of talent
The “Old” Global Economy

• **Core-periphery model**: Technology, capital, and skill reside in wealthy, developed nations (the core). Poor nations (periphery) remain underdeveloped suppliers of natural resources or cheap labor for corporations based in core. Uneven or dependent development.

  - Best and brightest students from around the world gained access to higher education in DC
  - Most, especially from poor nations, remained in these countries
  - Vicious cycle: the brain drain made developing nations poorer and rich nations richer
The “New” Global Economy

• The rise of “brain circulation” is altering developmental opportunities in the periphery
• Taiwan and Israel, peripheral in 1970s, became centers of entrepreneurship and innovation when “brain drain” was reversed 1980s and 1990s
• The rise of dynamic hubs of technology in China and India in past decade demonstrate the transformative impacts of brain circulation
“Silicon Valley’s high skilled immigrants seek wealth and professional success in their home countries -like Jason and the Argonauts of Greek mythology who faced hardship in search of the golden fleece”

- AnnaLee Saxenian
Immigrant professional entrepreneurs

Abroad
• Immigrants build self-help networks to aid integration and professional advancement in Silicon Valley
• Chinese and Indian networks especially strong
• **Indian and Chinese started 27% of technology companies in Silicon Valley, 1980 -2000: 4,146 companies, 122,386 jobs and $37 billion sales**

Home
• Influence growth back home
• Directly: starting technology companies; transferring know how; raise capital; establish partnerships; identify market opportunities
• Indirectly: Influencing policy formulations and institutional environment
Innovation in the Periphery

The new Argonauts transfer global best practice, support growth of new technology ecosystems
• Silicon Valley pioneers new product definition, architectures, leading edge technologies
• Taiwan specializes in global logistics and design
• Israel specializes in sophisticated security software and telecommunications
• Shanghai leads low cost, high quality manufacturing
• Bangalore leads low cost, high quality software and services

Cross-regional collaborations deepen innovative capabilities of local ecosystems
Scientific Human Capital and Investment Climate

• Availability of inputs is a crucial component of the investment climate
• Not simply an abundant labor force, but skill levels and technological know how
• International integration, infrastructure, governance, human resources and skills, and access to finance
• Investors are likely to be pulled to locations with abundant skilled workers and advanced technology.
Hsinchu Science Park, Taiwan
Shanghai, China
Tel Aviv, Israel
Bangalore, India
In September 2000, the Ministry of External Affair constituted a High Level Committee on the Indian Diaspora

- To review the status of PIO (People of Indian Origin) in the context of the Constitutional Provisions;
- Examine laws and rules applicable to them, both in India and the countries of their residence;
- Study the characteristics, aspirations, attitudes, requirements, strengths and weaknesses of the Indian Diaspora and its expectations from India;
- Study the role PIOs could play in the economic, social and technological development of India;
- Examine the current regime governing the travel and stay of PIOs and investments by PIOs in India.
Case 1: India (Continued)

*Diaspora initiatives of the Ministry of External Affairs*

- Human resources and research capacity development to augment collaboration for strengthening Indian education, research, and human resource capabilities in frontier areas of basic sciences and cutting edge technologies.
- Technology entrepreneurship to enhance India’s competence in this area, utilize venture financing and mentoring the younger generation for creating wealth from knowledge.
- Establishing India as an international science center by catalyzing the participation of Indian scientists and institutions in major international science projects and in programs of major advanced research facilities abroad.
- Establishing India as a global research and development platform as a preferred R&D outsourcing destination.
- Alma mater relationship to connect alumni abroad with their alma mater for purposeful and sustainable relationships.
Case 2: Israel

- Sixty years ago in Israel, even the basic manufacturing did not exist; today country hosts major production plants for companies like Cisco, Intel and Google

- One third of the population of Israel is born outside of the country; ninety percent is composed of first and second generation immigrants

- The special characteristics of immigrants played an important role
Case 2: Israel (continued)

- Success in education is important, but not the necessary cause (eg. Singapore)
- China, India, and Korea also produce technology but they are not “idea factories”
- Creative collaboration of public sector and private companies
- Creative financing and management strategies: it is as important to market the product and as producing it.
- Utilization of venture capitals (One in 1991; over 100 in 2000)
- Yozma: Activated the diapora by providing protection for the investor
Case 2: Israel (continued)

- The new developments activated Israeli entrepreneurs to return: Michael Laor-Cisco, Dov Frohman-Intel
- Richard Devane: “China, India and Israel enjoyed investment or technology booms over the past decade, and these booms are linked ... by expatriate leadership in all three countries”
- Israelis “marinated in Silicon Valley Culture” have positive externalities on their home country
Rethinking the Global Economy

• Cross-border professional and technical communities transfer technical, market & business information rapidly between distant regions
• Sub-national clusters of skill and technology in peripheral regions, supported by aggressive local policymakers, pursue cross-regional collaboration, reciprocal upgrading
• Highly mobile scientists and engineers pioneer entrepreneurial experimentation and innovation that supports upgrading and rising wages in periphery
• These contributions might be small compared to FDI, but boosts indigenous entrepreneurial potential
One size does not fit all!

- There are major generational differences in return migration
- Sectoral differences offer different results
- There is a mismatch between the requirements the firms in home country and the skill sets offered by returning scientists
- There are differences in working culture in home and host countries’ firms
- Motivation of returning scientists differ
## A quick evaluation: SWOT

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<th>Strengths</th>
<th>Weakness</th>
<th>Opportunities</th>
<th>Threats</th>
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<td><strong>Economic Regime</strong></td>
<td>Reform oriented government</td>
<td>Poor investment climate</td>
<td>Develop financial system and utilize innovative financial tools</td>
<td>Administrative barriers</td>
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<td><strong>Innovation System</strong></td>
<td>High-skilled labor globally; MNCs develop the skill base</td>
<td>Remote from the sources of leading-edge technology; distant from developed markets</td>
<td>Develop “Talent Management” policies to utilize cross-border entrepreneurs</td>
<td>Continued loss of scientific talent</td>
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<td><strong>Education and HR</strong></td>
<td>Strong S&amp;T education</td>
<td>Lack of flexibility in curriculums; weak university-industry relations</td>
<td>Reform education institutions acc. new talent policies</td>
<td>Resistance from established institutions</td>
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<td><strong>IC Infrastructure</strong></td>
<td>Strong ICT capacity</td>
<td>High prices, poor application</td>
<td>Expand penetration ratios</td>
<td>Difficulty to switching from old applications to new ones</td>
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Concluding Remarks

• Immigrant entrepreneurs are key to innovation in the periphery

• A national talent management framework:
  – Sectoral differentiation in policies targeting reverse brain drain
  – Supporting policies to augment integration of returning scientists
  – Minting talent; initiating networks abroad
  – Seeking experience in marketing and management of technology

• Simultaneous improvements:
  – Creative funding mechanisms
  – Collaboration with local governments – “techno-cities”
  – Improvement of licensing and patenting procedures to help ideas turn into projects
  – Specialized tax procedures for technology companies during economic recessions
  – Increased investment in R&D
Thank You!
ANNEX
Gross domestic expenditures on research and development (billions of dollars)

Source: OECD Main Science and Technology Indicators, 2006