From Brain Drain to Brain Circulation: Rethinking the Global Knowledge Economy

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The old global economy: core & periphery

- Following WWII the best and brightest students from around the world gained access to US higher education.
- Most, especially from poor nations, remained in US due to superior professional and economic opportunities.
- US accused of creating a vicious cycle: the brain drain made developing nations poorer and rich nations richer.

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.
The brain drain: US doctorate recipients

Source: National Science Foundation, SRS. 2009
The brain drain: engineering doctorates

Source: National Science Foundation, SRS. 2009
Visa-holding doctoral recipients, 2008

Top 6 countries = 21% of all doctorate earners and > 60% of visa-holding doctorate recipients

Source: National Science Foundation, SRS. 2009
Visa-holding doctorate earners stay to work in US -- at least initially

% with definite post grad location commitment

- U.S. location
- Foreign location

The view from Silicon Valley
Foreign-born engineers in SV workforce

% of total engineers

- India
- Vietnam
- Philippines
- Korea
- Japan
- Taiwan
- China
- Canada
- All other foreign born
- Europe

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15% | | | | 53%
20% | | | | 31%
15% | | | | 20%
53% | | | | 15%
Immigrant professional networks

- Immigrants build self-help networks to aid integration and professional advancement in Silicon Valley
  - Help seeking jobs or promotions when “glass ceilings” limit advancement within companies
  - Professional and technical associations offer advice, relationships and learning the Silicon Valley model
- 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
The new global knowledge 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
The new Argonauts set sail

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.
Hsinchu Science Park: Silicon Valley sibling
Silicon partner: Taiwan’s IC foundries:
Silicon Shanghai
Tel Aviv, Israel
Bangalore: a software services partner
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
Silicon Valley’s foreign co-inventors

Foreign co-inventors listed on patents with Silicon Valley inventors

No of patents

Taiwan | Israel | Japan | Singapore | South Korea | Germany | China | India | Finland

Silicon Valley’s global collaborations

Top regions for collaboration with inventors in Silicon Valley

Rethinking the global economy

Not just global corporations

- **The New Argonauts**: Cross-border professional and technical communities transfer technical, market & business information rapidly between distant regions

Not just the nation-state

- Sub-national clusters of skill and technology in peripheral regions, supported by aggressive local policymakers, pursue cross-regional collaboration, reciprocal upgrading

Not low-cost labor

- Highly mobile scientists and engineers pioneer entrepreneurial experimentation and innovation that supports upgrading and rising wages in periphery
Thank you!