Drivers of Innovation Policy in Late Industrialising Countries – Endogeneous vs. Exogeneous

Prof. Stefan Kuhlmann,
University of Twente, Netherlands
Britta Rennkamp
University of Cape Town

Eu-SPRI PhD and Early Career Researcher Conference
"Challenges in Research and Innovation Policy Studies"
Manchester Institute of Innovation Research
University of Manchester, UK; 20-23 September 2011

UNIVERSITY OF TWENTE.

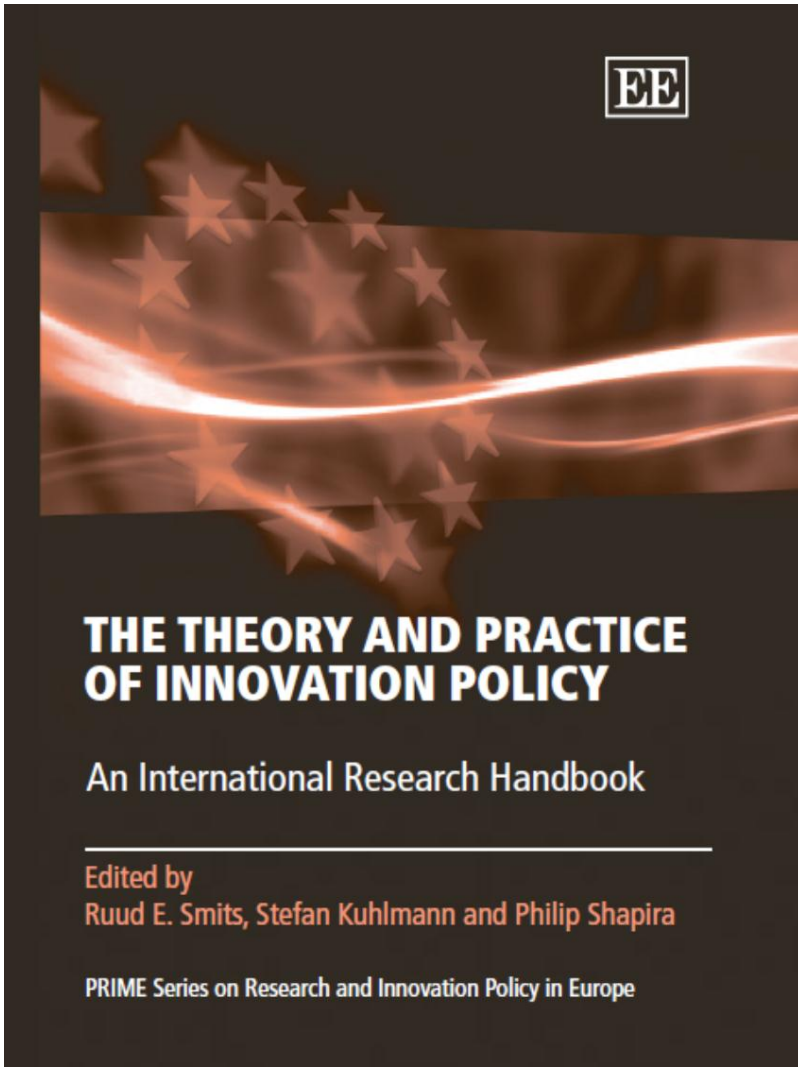
IGS
INSTITUTE FOR INNOVATION AND GOVERNANCE STUDIES

New book on Innovation Policy – but …

Smits, R.; Kuhlmann, S.; Shapira, P. (eds.): *The Theory and Practice of Innovation Policy - An International Research Handbook*, Cheltenham, UK (Edward Elgar), 2010

Comprehensive new handbook authored by outstanding scholars from Europe and US …

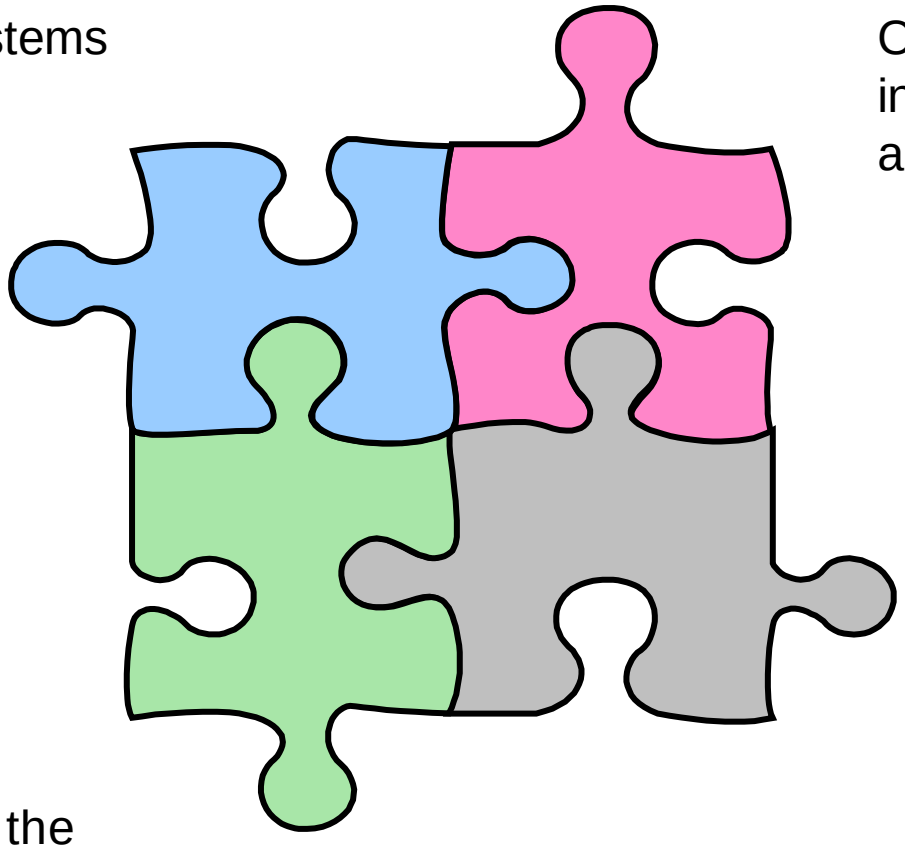
… But no chapters dealing with science and innovation policies in Late Industrialising Countries (LIC) !



Endo- vs. exogeneous: What's the puzzle?

Internationalization
of Innovation Systems

Intergovernmental
Organizations
in Science
and Innovation



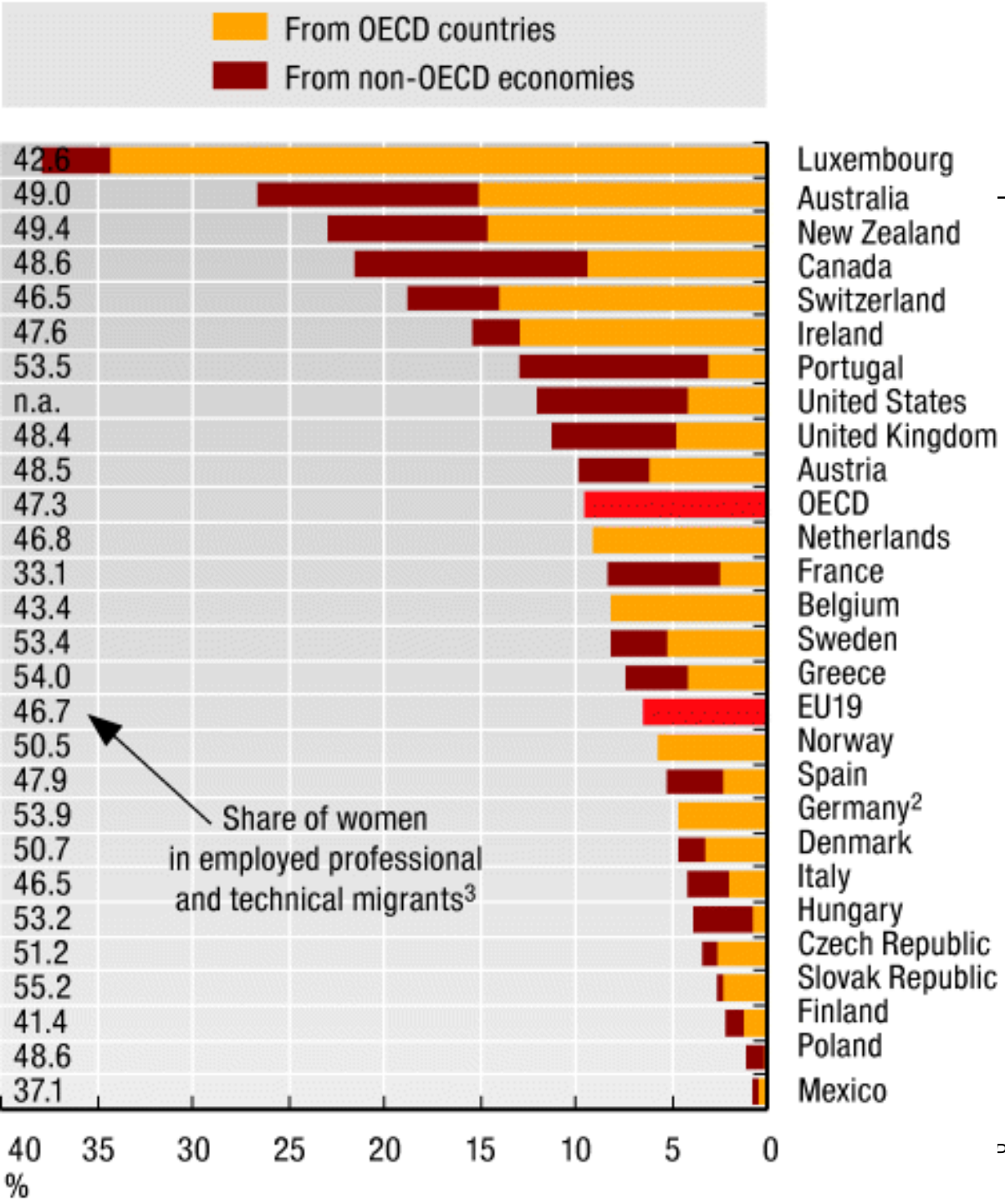
International and
Domestic Innovation
Policy

Technological
Catch Up beyond the
Triad – Late Industrializing Countries

Functions of Innovation Systems and Policy

Factor	Institutions and public policy
Entrepreneurial activities	Corporate governance; insolvency legislation; education
Knowledge creation	Funding of basic and applied research; (higher) education and training
Knowledge diffusion through networks	Support for R&D and innovation networks (industry, academia, et al.) and clusters; multi-actor programmes; support for knowledge infrastructures (e.g. patent data bases)
Guidance of the search	Science and technology foresight exercises; communication platforms/fora for industry, academia, societal organisations and public policy
Market formation	Regulatory frameworks for technical standards and norms; ethical regulation; Intellectual property rights (IPR); et al.
Resources mobilization	Thematic or sectoral profiling of public investment in science, R&D, and education
Creation of legitimacy/ counteract resistance to change	S/T foresight exercises; communication platforms/fora; maintaining policy networks (e.g. multilevel cooperation across regions, nations and trans national levels); fostering institutional adaptation and change

Hekkert, M. / Suurs, R. / Negro, S. / Kuhlmann, S. / Smits, R. (2007): Functions of Innovation Systems: A new approach for analysing technological change. In: *Technological Forecasting & Social Change*, vol. 74, Issue 4, 413-432



Internationalisation

Employed **highly skilled professional and technical migrants** from OECD and non-OECD economies, by OECD country of residence, 2000 or 2001

(Source: OECD STI 2007)

IGS INSTITUTE FOR INNOVATION AND GOVERNANCE STUDIES

Elements of a Global SI Governance Architecture

	International organization	International Regimes	Club Governance	Global Funds	Regional Integration	Research networks	Interregional Cooperation
Explicit SI Policy	**UNESCO** UNCTAD UNSTD WIPO	WTO- TRIPS	G8/O5 Carnegie Group **OECD** Global Science Forum G20 planned STI Cooperation	UNFSCTD	EU-7. FP AMCOST SAMCOST ASEAN S&T Network ERA MERCOSUR	ICSU UNU IAC GRA	IBSA Trilateral Commission for S&T G77 Consortium on STI AKP Dialogue on IPR
Implicit SI Policy	**World Bank** **IMF** UNIDO ECOSOC WHO IEA IPCC	UN Conventions UNCBD UNFCC UNCCD	G8/O5 Gleneagles Dialogue	GEF GFATM		CGIAR HFSP	

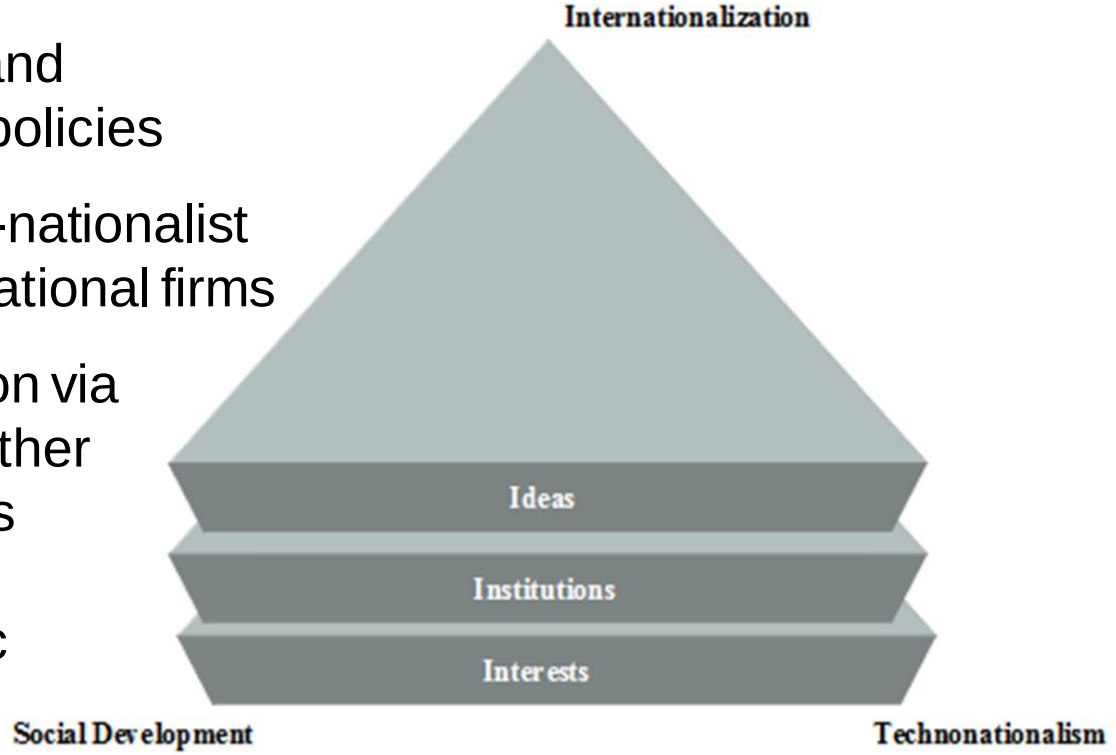
Our research (2009 -2012)

- Since 1990s Late Industrialising Countries (LIC) defined SI policies under increasing exogenous influence. International gov't & non-gov't organizations (IO, e.g. OECD) promote policy models and guidelines.
- How do LIC gov'ts perceive problems requiring SI policy intervention? Do they adopt advice from IO or other countries? When and how do their SI policy innovations emerge?
- Evidence from qualitative research in ***Brazil*** and ***South Africa*** (both GINI Index values over 50; medium values in scientific-technologically related World Development Indicators).
- Document analysis; quantitative analysis; some 100 expert interviews

LIC: Three sources of legitimacy

- LIC define SI policy strategies drawing on three sources of legitimacy:

1) Domestic social and poverty oriented policies
2) Domestic techno-nationalist interventions in national firms
3) Internationalization via UN, OECD and other internat. platforms (not necessarily meeting domestic needs).



Three sources of legitimacy: Indicators

1) Domestic social and poverty oriented policies
   - Support for smallest, small and medium sized enterprises; spin offs and start up of new enterprises
   - Support of local innovation system in low income communities
   - Research incentives and funding on development and poverty issues
2) Domestic techno-nationalist interventions in national firms
   - Large budget allocation to single firms
   - Large budget allocation to public enterprises and state controlled prestigious technology projects (e.g. nuclear)
   - % of R&D expenditure in public research institutions, vs. public firms, vs. more systemic programming targeting at whole value chain
3) Internationalization
   - Adoption of international concepts for policy framing; policy transfer
   - Reactive policies to global (security/ economic/ financial) threats
   - Strategic international cooperation and promotion of domestic sciences

Technonationalism

- **1st Phase: 1950-1980s: Import Substitution and technological missions**

Brazil

First institutions for S&T Promotion
Technological Missions
in public enterprises
World Bank S&T Programs

South Africa

Technological Missions along
Apartheid's needs
International Isolation
S&T for self sufficiency and defense

- **2nd Phase: 1985-1994: Neoliberalism, open markets and laissez fair**

Brazil

Industrial policy =taboo

South Africa

SI Institutions, Shift to innovation within a neoliberal framework

- **3rd Phase: 1995-2010: Innovation systems and policy Innovation**

Brazil **South Africa**

Sectorial funds, Innovation systems discourse with budget allocation to government driven technology missions

SI for social development

Brazil

Since 2003 explicit focus on SI for social inclusion Aligned to Fome Zero

2007: PAC (MCT 2007) Vocational training centres For STI (CVT)

Focus on ‚popularization' of Science and diffusion of Technology rather than innovation

South Africa

Since 1996: Systems approach and inclusive SI policy

Human resource development Key entrance point for SI policy

Focus in SI policy and higher education policy on PhD production rather than training of technicians according to economic needs

Internationalization of SI policy

1st phase: 1950s- 1990s Strategic bilateral cooperation

Brazil
Technology transfer
Nuclear cooperation

South Africa
Selective cooperation with like minded governments in conditions of overall isolation

2nd phase: 2002-2007: multilateralism, STI South South Cooperation

Brazil
Pro Sul, Pro Africa

South Africa
Nepad S&T, AMCOST

IBSA, Cancun WTO turning point, G8+ 5, OECD outreach,

3rd phase: 2007-2010: Selection, stronger linkage of foreign agenda to the domestic needs

Preliminary Findings: Mixed dynamics

- State led, supply driven interventions: Systemic (normative), but linear practice of innovation policy
- Increasing role of models from IO for policy learning (cognitive governance)
- Policy transfer (cognitive and normative governance)
- Decreasing role of IO in loans (legal governance)
- Budget allocated towards big technology projects
- Punctual policy innovation: Sectorial funds, Arranjos Produtivos Locais (APLs)
- Social inclusion not systematically in practice
- Shift in international cooperation: Brazil and SA are both not only recipient, but now also donor and driver of international STI agenda setting
- ***New models of South-driven SI policy emerging?***

Outlook: System-evolutionary approach

State of innovation system

Steady state	Structural change
Operational innovation policies ▪ focus on implementation of existing set of policies ▪ aiming at keeping system vivid and competitive ▪ removing system failures	**Strategic innovation policies** ▪ generating new set of policies ▪ seeking better fit to new global or domestic context ▪ facilitating creative destruction and the emergence of *Neue Kombinationen* (Schumpeter)

Drawing on R. Smits, S. Kuhlmann, M. Teubal (2010); in: Smits, R.; Kuhlmann, S.; Shapira, P. (eds.): *The Theory and Practice of Innovation Policy: An International Research Handbook*, (Edward Elgar), 2010

Outlook: Systemic SI policy for LIC ?

- Re-shaping of innovation systems
  - facilitating construction and deconstruction of subsystems, preventing of lock-in
  - supporting prime movers
  - ensuring that all relevant actors are involved
- Building cross-linking platforms and new spaces for learning and experimenting
- Stimulating demand articulation, strategy and vision development
- Providing and exploiting an infrastructure for distributed strategic intelligence (building on technology assessment, foresight, evaluation, benchmarking etc.)

Our research in context

- Twente Graduate School, program “Governance of Knowledge and Innovation”
- Eu-SPRI Forum, the European Forum for Studies of Policies for Research and Innovation (13 leading institutes)

TWENTE GRADUATE SCHOOL
GOVERNANCE OF KNOWLEDGE AND INNOVATION (GKI)

Eu-SPRI
European Forum for Studies of Policies for Research and Innovation