



Human Sciences and Technologies Advanced Research Institute

STANFORD UNIVERSITY

A Triple Helix Systems “horse” for the Smart Specialisation “carriage”?

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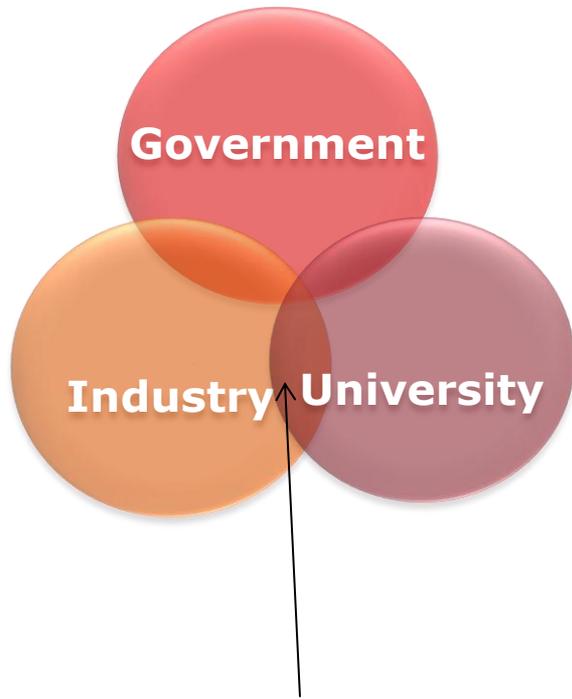


Triple Helix XI Conference Workshop
“Supercharging the Triple Helix: Smart Specialisation as a game changer”
London, 8-10 July 2013

Outline

1. Triple Helix Systems – key issues
2. Smart Specialisation – key issues
3. Some “weak spots” in the smart specialisation theory
4. A Triple Helix Systems “horse” for the smart specialisation “carriage”?

The Triple Helix model

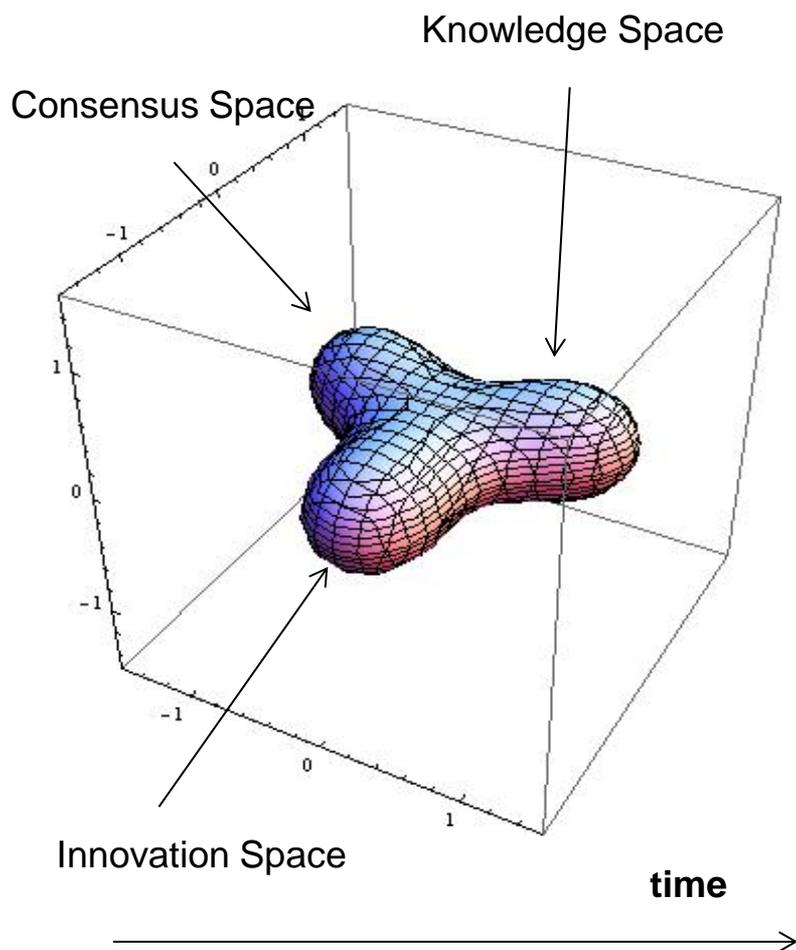


Innovation at the intersection of U-I-G

Etzkowitz and Leydesdorff (2000)

- Enhanced role of U in the Knowledge Society, as equal partner to I and G, or even taking a lead role
- University 'third mission', next to education and research
- Entrepreneurial university, Entrepreneurial scientist
- Innovation as the outcome of non-linear U-I-G interactions
→ "endless transition" to innovation
- Institutional spheres "take the role of the other" for promoting innovation when the other is weak or absent:
 - government as provider of public venture capital;
 - universities engage in tech transfer and firm formation;
 - industry develops proprietary education and training
- TH model widely accepted by policy-makers → legitimization of the G role (especially in times of crisis). Neo-classical and evolutionary economics do not provide a rationale for G intervention in the economy, only for discrete policy interventions in case of system or market failure → *important role of TH in innovation policy.*

The Triple Helix Systems model - From 'spheres' to 'spaces'



Ranga and Etzkowitz (2013)

- Analytical construct that synthesises key features of TH interactions into an 'innovation system' format: (i) components, (ii) relationships and (iii) functions
- Fills the gap between the Triple Helix model and innovation systems theory
- Provides a fine-grained view of innovation actors and relationships between them
- Innovation as the outcome of articulation between the TH Spaces and dynamic, boundary-spanning and diachronic transition of knowledge flows between them
- TH Systems transcend sectoral or technology boundaries → boundary permeability among institutional spheres as source of organisational creativity, circulation of individuals within and between the spheres, creation of new organizations.
- Offer empirical guidelines for policy-making on knowledge-based regional development

1. Components: U-I-G institutional spheres and specific actors

- R&D and non-R&D (“hidden”) innovators
- **“Single-sphere” and “multi-sphere” (hybrid) institutions**
 - ‘Single–sphere’: high specialization and work centralization, limited mobility of workers, rigid and inertial institutional boundaries, low interaction with entities of another institutional sphere
 - ‘Multi-sphere’: smaller-scale hierarchies, fewer layers and more decentralized decision-making, increased flexibility and responsiveness to changing market demand, permeability of institutional boundaries
- **Individual and institutional innovators**
 - Individuals: Innovation Organizer, Entrepreneurial Scientist, individual entrepreneur
 - Institutional: collective entrepreneur

2. Relationships

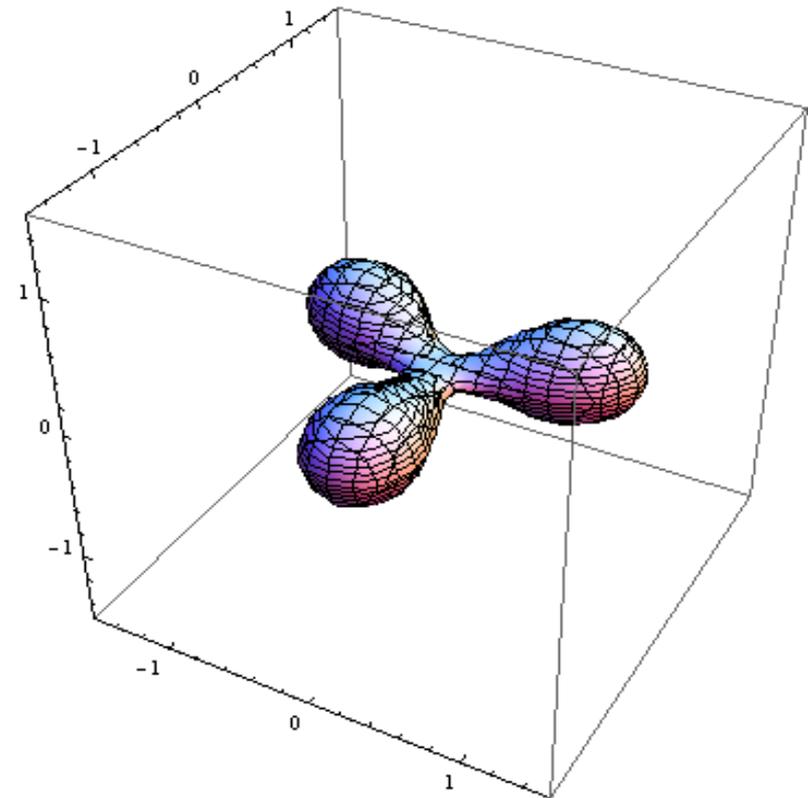
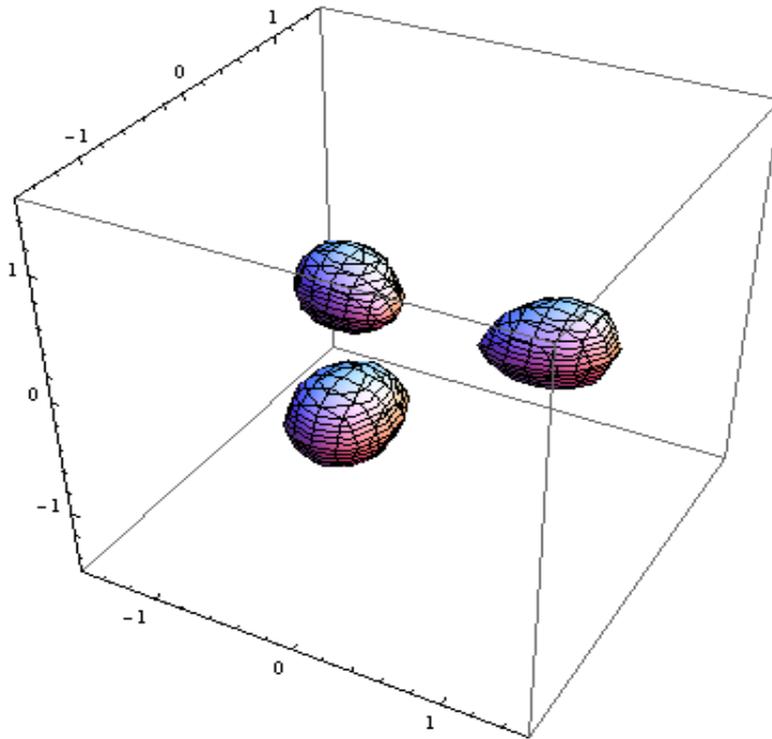
- **Technology transfer**
- **Collaboration and conflict moderation**, turning tension and conflict of interest into convergence and confluence of interest through 'win-win' situations. Specific to triadic relationships, in contrast to dyadic ones.
- **Collaborative leadership**: ensures the success of a heterogeneous team to accomplish a shared purpose. Essential role of 'Innovation Organizer" + mix of top-down and bottom-up processes to build agreement, generate support for new ideas.
- **Substitution**: institutional spheres fill gaps that emerge when another sphere is weak, e.g. government and public venture capital, universities and tech transfer and firm formation, industry developing training and research.
- **Networking** into formal and informal structures at national, regional and international level

3. Functions: Knowledge, Innovation and Consensus

- **Knowledge Space:** knowledge generation, diffusion and use originating from R&D and non-R&D activities
- **Innovation Space:** formation and functioning of hybrid organizations that promote innovation.
- **Consensus Space:** formal and informal governance activities that bring together the U-I-G actors to brainstorm, discuss, evaluate ideas, projects.
- **Time as the 4th dimension (four-dimensional spaces)**
- TH Spaces do not replace the 'spheres', they work in tandem to provide an engine for regional renewal → a new paradigm for regional development policy and practice.

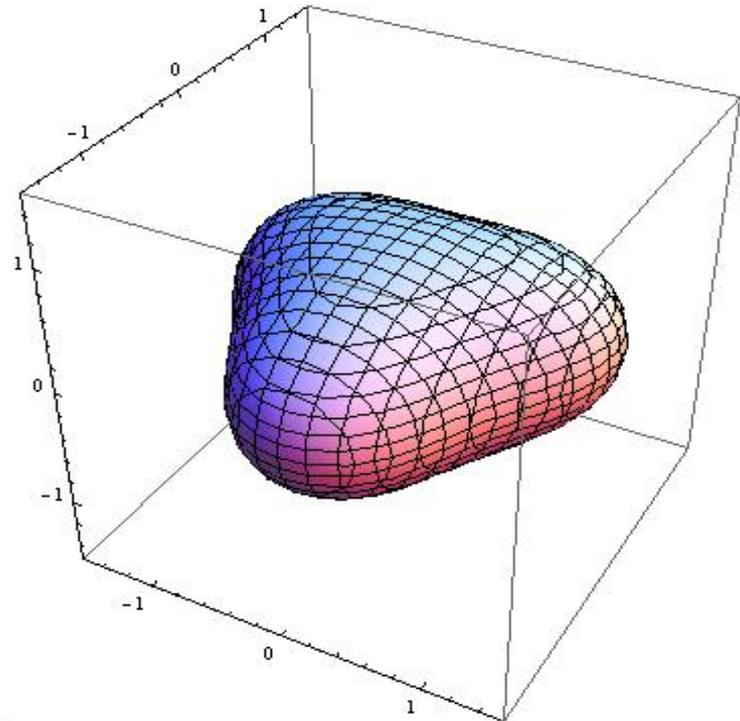
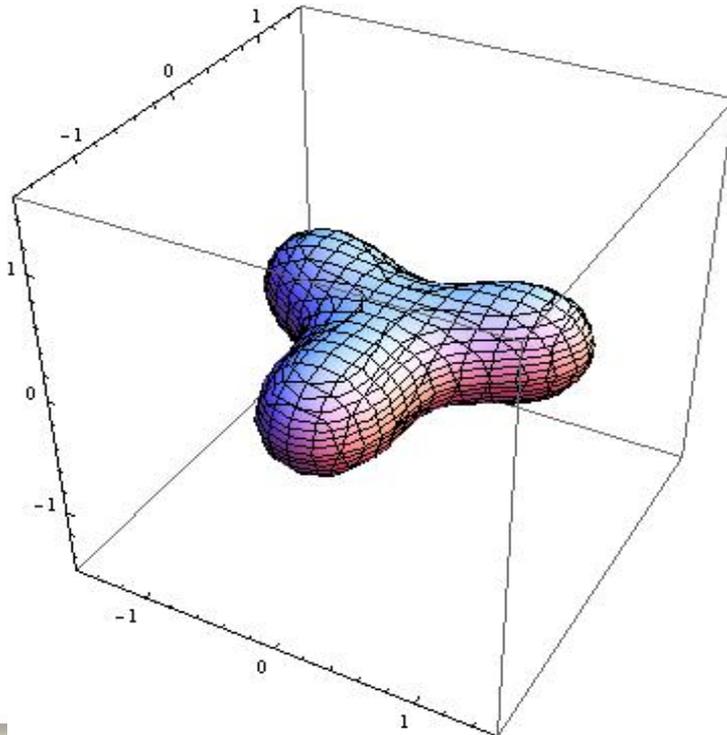
Formation of a Triple Helix Space

1. U, I, G institutional spheres apart: a *laissez-faire* regime.
2. U, I, G institutional spheres getting closer together and starting to interact. Emergence of a space.



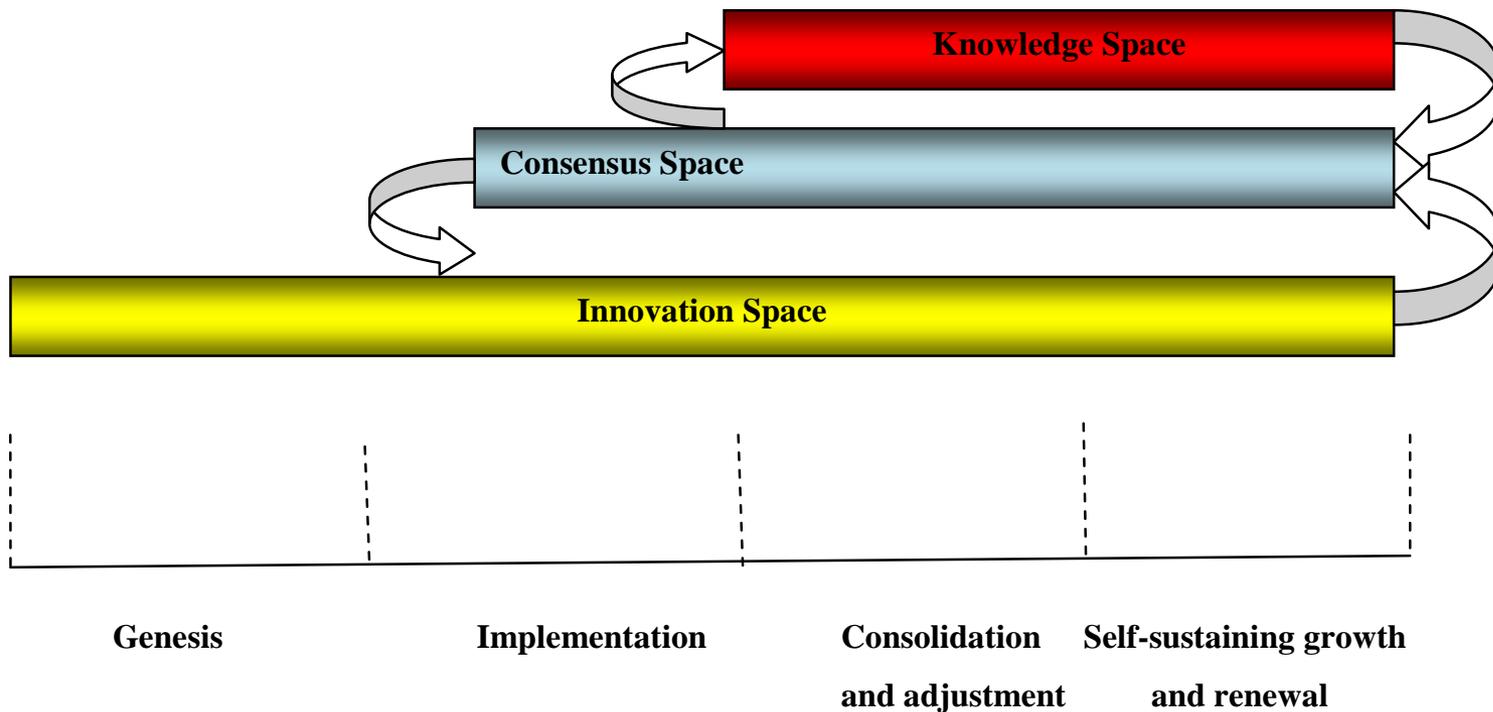
Formation of a Triple Helix Space

3. U, I, G institutional spheres increasingly overlapping
4. U, I, G institutional spheres overlapping: 3 processes
 - a. Formation of a 'stem cell' space
 - b. Differentiation of the 'stem cell' space into a K, I, C space
Determined by specific 'signals' from the TH spheres and local environment.
 - c. Consolidation of a K, I, C space



Innovation as a result of articulation and transitions between the Triple Helix Spaces

Stockholm's Kista Science City



Source: Ranga and Etzkowitz (2013)

Smart Specialisation (SS) – Key concepts*

- Rooted in the advisory work of the ‘Knowledge for Growth’ (K4G) expert group to the former EC Commissioner for Research, Janez Potocnik.
- Reflected ERA implicit assumptions: different countries/ regions tend to specialise in different knowledge-related sectors, depending on their capabilities (von Tunzelmann 2009).
- Became a central pillar of *Europe 2020 Strategy* and a reformed European Cohesion Policy (‘smart growth’, ‘green growth’, ‘inclusive growth’)
- Originally emerged from the sectoral growth literature, recently applied to the regional policy context → regions vary not only in terms of their technological and industrial competences, but also in terms of their potential evolutionary trajectories.

* Foray, D., P. A. David and B. Hall (2009), Smart Specialisation – The Concept. Knowledge Economists Policy Brief n° 9, June 2009.
http://s3platform.jrc.ec.europa.eu/documents/10157/0/kfg_policy_brief_no9.pdf

Giannitsis, T. (2009), Technology and Specialisation: Strategies, Options and Risks. Knowledge Economists Policy Brief n° 8, May 2009.
http://ec.europa.eu/invest-in-research/pdf/download_en/kfg_policy_briefs_no_5_9.pdf

McCann, P. and R. Ortega-Argilés (2011), Smart Specialisation, Regional Growth and Applications to EU Cohesion Policy. Economic Geography Working Paper 2011, Faculty of Spatial Sciences, University of Groningen.
http://ipts.jrc.ec.europa.eu/docs/s3_mccann_ortega.pdf

Smart Specialisation (SS) – Key concepts

- Regions required to identify sectors/technological domains of likely competitive advantage and focus their regional policies to promote innovation in these fields
- New RDI policy orientation for EU regions/countries - national smart specialisation strategies as ex-ante conditionality for receiving 2014-2020 Structural Funds
- SS based on the horizontal propagation of a General Purpose Technology (GPT) throughout the economy, complementarity with other technologies:
 - *leader regions* invest in the invention of a GPT or combination of different GPTs;
 - *follower regions* invest in the «*co-invention of applications*» (applications of a GPT in one or several key regional economy domains)
- Advantages:
 - Application of co-invention increases the size of the GPT market and improves the economic return on invention activities relating to it.
 - Higher integration of follower regions/firms within a competitive environment
 - Creation of niche markets less exposed to larger external competitors
 - Increased retention of human resources formed by the region as «*co-specialised assets*», through higher education, professional training and research programmes

Smart Specialisation (SS) – Key concepts

- SS not a strategy for ‘picking winners’, not imposed through top-down industrial policy or a foresight exercise, but an “**entrepreneurial process of discovery that can reveal what a country or region does best in S&T.**” (Foray et al 2009).
- **Lead role of entrepreneurs** in discovering promising future specialisation areas, due to capacity of gathering localized information, formation of social capital assets.
- **Relatively modest role of government:**
 - corrective public policy measures to compensate under-investment by entrepreneurs in the “discovery process” and support their greater engagement.
 - support to entrepreneurs through diffusion of information about technologies, market and financing, assistance in network formation
- **Three main responsibilities for governments:**
 - Supply incentives to encourage entrepreneurs and other organizations (higher education, research labs) in the discovery of the regions’ specialisations.
 - Evaluate and assess effectiveness of support to a particular line of capability formation
 - Identify complementary investments for the emerging specialisations (e.g. educational and training institutions for provision of adequate human resources).

“Weak spots” in the SS theory

- 1. SS vision as an “entrepreneurial process of discovery” and the lead role of entrepreneurs**
 - Overlooks/obscures important roles of other innovation ecosystem stakeholders (firms – large, SMEs; HEIs, VCs, BAs, etc.)
 - “Lost in transition” - theory scattered across different innovation models with no solid foundation in any of them
- 2. Government role reduced to corrective policy measures and assistance to entrepreneurs**
 - Places government in a “passive” role
 - Overlooks recent developments on “government as entrepreneur” (e.g. public venture capital)
- 3. Strong focus on technology specialisation → R&D specialisation**
 - Overlooks the role of non-technology/non-R&D innovation (‘hidden innovators’)
- 4. Policy-making challenges: technology specialisation strategies in emerging fields involve the need for a clear government position between selection/non-selection, support/no support, dealing with risk**
 - Conflicts with the reduced role of the government, no ‘picking winners’ approach.
 - Dealing with risk may involve significant government interventions in the market (e.g. support to clusters or new market agents in particular technology areas, etc.)

“Weak spots” in the SS theory (cont.)

5. HEIs role reduced to “support institutions” for the provision of human resources

- Overlooks the HEIs’ involvement in the generation, diffusion and use of technologies through technology commercialisation, academic spin-off formation
- Overlooks the contribution of HEIs to the formation of the entrepreneurs
- Overlooks the role of HEIs to regional development

6. The three essential concepts for SS: *entrepreneurial search processes, relevant size of the domain* and *connectedness* (through intra- and inter-sectoral spillovers) don’t work well for regional cohesion

- They are all higher in advanced regions
- Policies to enhance them actually increase the gap between regions, do not reduce it.
- SS logic appears to discriminate against lagging regions (McCann and Ortega-Argiles, 2011)

A Triple Helix Systems “horse” for the SS “carriage”?

1. TH Systems accommodates the role of entrepreneurs (both individual and collective), but also offers a much more fine-grained view of other actors involved in SS, especially HEIs, which have little visibility in the SS – **see TH Systems components and functions**
2. SS theory (Foray et al. 2009) argues for a reduced role of government, but actual SS implementation requires a strong, strategic government intervention (e.g. fine-tuning of policies for creation of innovative units/clusters/regions, allocation of resources, adequate financial support mechanisms, priority design in selected area, RDI policies, U-I cooperation policies, etc.) – **see TH Systems Consensus Space and its formal and informal governance mechanisms (accommodate EU multi-levels of governance)**
3. SS theory sees educational and training institutions as “complementary investments associated with the emerging specialisations” – **see TH Systems Knowledge and Innovation Spaces**

A Triple Helix Systems “horse” for the SS “carriage”?

4. SS has a strong focus on technology and sectors – TH Systems transcend sectoral and technology boundaries, focus on boundary permeability, circulation of people and resources across boundaries, inter-disciplinarity – **SS and innovation as outcome of the articulation and transitions between all TH Systems spaces**
5. The co-evolutionary processes between technologies, institutions, business activities and public policies in the development of emerging fields of specialisation illustrate very well the process of formation and differentiation of the **TH Systems “stem cell space”**
6. SS appears to be less relevant for large and highly diversified urban centres and leading knowledge regions (OECD 2011), but more suited to intermediate regions with both urban and rural areas, and smaller sized regions with urban centres. TH Systems relevance not formally differentiated between advanced and lagging regions, but empirically proven to be more relevant for weaker or declining regions that seek to strengthen/reinvent themselves through knowledge/innovation investments – **TH Systems good foundation for regional cohesion policy**

“This I tell ya, brother, you can't have one without the other.”
(Frank Sinatra)

THANK YOU!

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