Promotion of transformative innovations for S3 – on the potentials of unrelated knowledge combinations

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Presentation at Working Group on 'Understanding and Managing Industrial Transitions',
Brussels, December 09th, 2019

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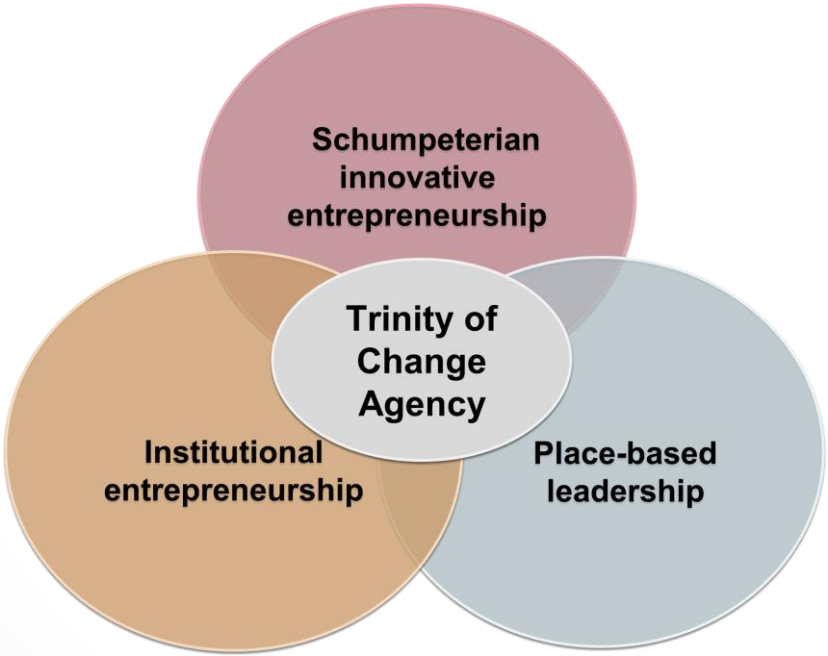
Smart Specialisation – diversified specialisation

- Smart Specialisation (S3) is probably the single largest attempt ever of an orchestrated, supranational innovation strategy to **boost economic growth through diversification**
- **It is not about 'specialisation'** as we know it (e.g. from **Porterian clusters**) but about ***diversified*** **specialisation** ('smart focus')
- Regions should identify domains of **existing and potential competitive advantage,** where they can build capabilities and **specialise in a *diversified* way compared to other regions**
- The focus of S3 is to go beyond path extension and promote new path development and transformative activities on a sub-sectoral level

Smart Specialisation – entrepreneurial discovery process

- **Entrepreneurial discovery process** should be understood **broadly**, i.e. not only as the efforts of a single entrepreneur
- The EDP must encompass all actors with an **entrepreneurial mindset** including **innovative (Schumpeterian)** entrepreneurs at the firm level, **institutional** entrepreneurs at universities and in the public sector, and **place leadership** at the regional level (the 'trinity of change agents')
- Important to place **EDP within a (regional) innovation system** (RIS) perspective emphasising the need for a public innovation policy/funding and exploration as well as exploitation
- Innovation as interactive learning between T-H stakeholders (+ civil society) as well as within firms and organisations (clusters)

Long-term proactive agency as transformative force



Grillitsch & Sotarauta 2019

Smart Specialisation – key aspects

- In S3 it is important to underline that specialisation is not to be understood in the traditional Porterian way, but as *diversified* specialisation. This means that a) new specialisations should have a higher value creation potential than the old ones, and b) that they should be different from specialisations found in other regions (i.e. diversified) – strategic prioritisation
- This is key to have an innovation based competition – a high road strategy, and not a cost based strategy – low road
- S3 is a vertical innovation policy: Supporting firms' and regions' exploration and exploitation capacity in prioritized domains (mission oriented policies/smart specialisation)

What is transformative innovations (activities)

- ’ ... the incentives to promote structural transformation in the presence of proximate opportunities are likely **quite different from that required when a country hits a dead-end.** It is quite difficult for production to shift to far-away products in the space, and therefore policies to promote large jumps are more challenging. Yet, **precisely those long jumps are the ones generating new options for subsequent structural transformation’** (Hidalgo et al., 2007, in Science)
- Cf. Foray and ’transformative activities’ in S3 based on ’unrelated knowledge combinations’ ”*where each TA is a gamble*”. TA often constitutes *radical innovations*
- The public sector has a key role in promoting ’transformative activities’ as this is a long-term strategy
- ’The public sector needs to be more *hungry and foolish*’ (Mazzucato)

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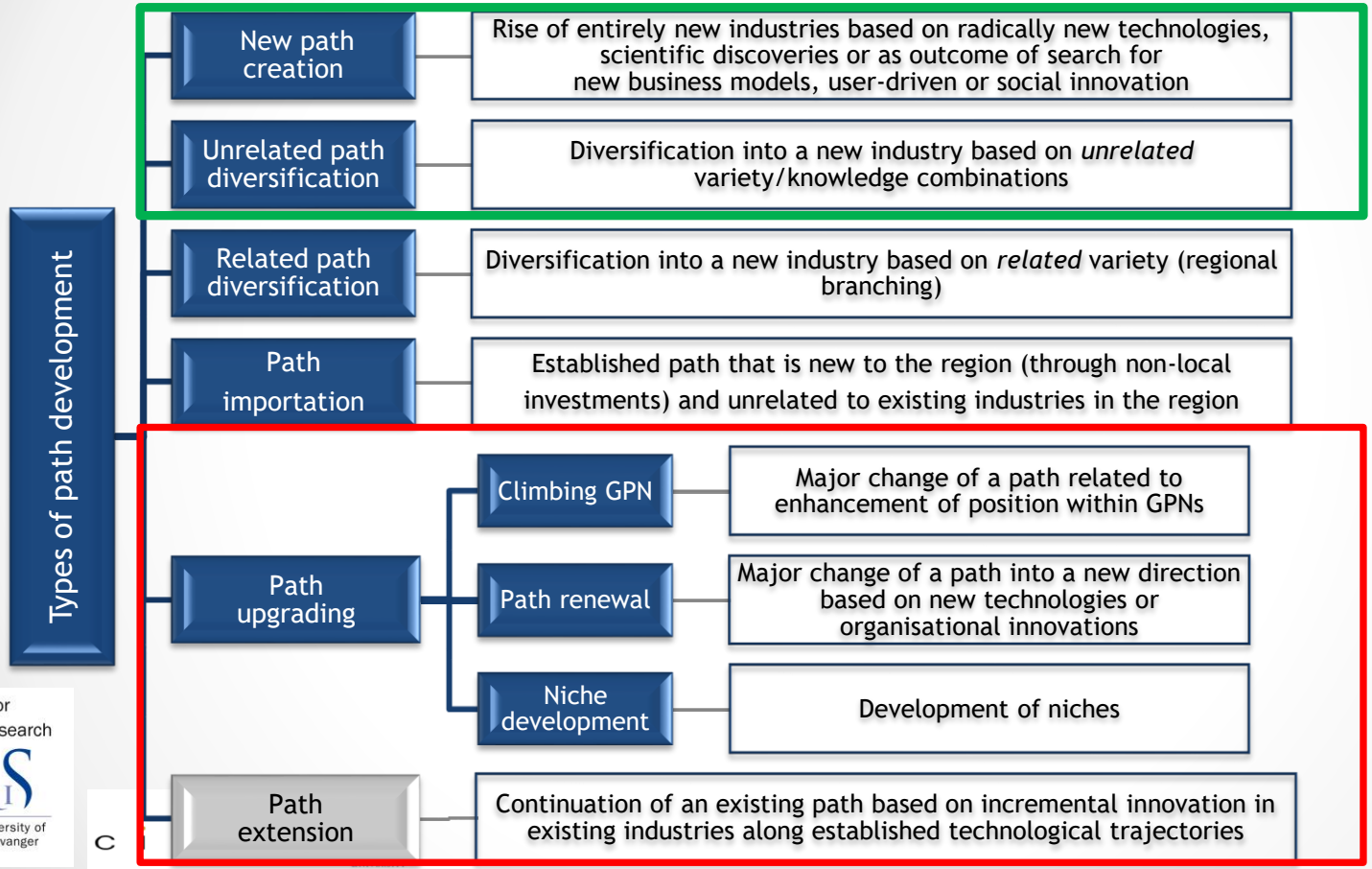
Types of industrial path development



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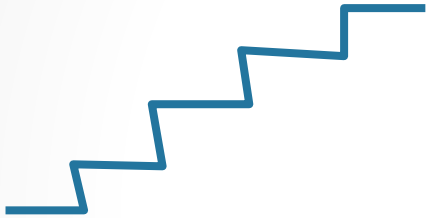
Broadening Perspective on Industrial Path Development



Specialisation
Growth/Extension
Climbing value chains

Related variety
Path Branching

Unrelated variety:
Unrelated path diversification
New path creation

Unrelated Knowledge Combinations: Unexplored potential for new regional industrial path development

Grillitsch, Asheim & Trippl 2018

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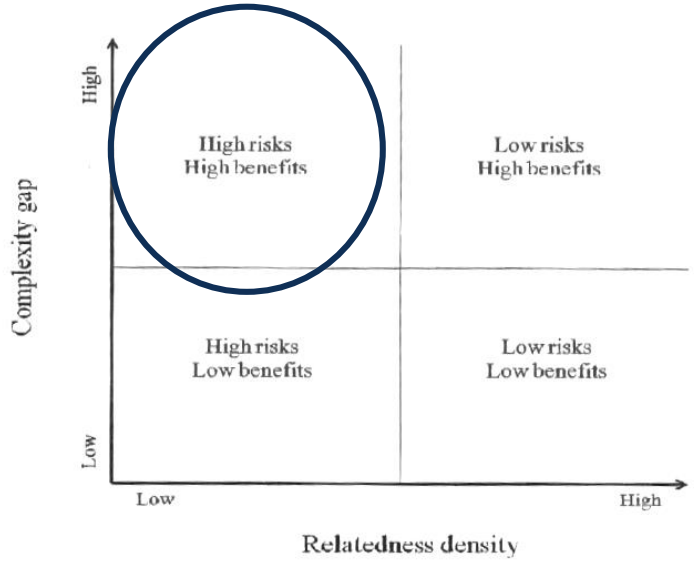
“Unrelated variety contributes to new path development due to the learning and innovation potential arising from the combination of dissimilar knowledge between sectors that have no/limited interdependencies” (Grillitsch et al., 2018).



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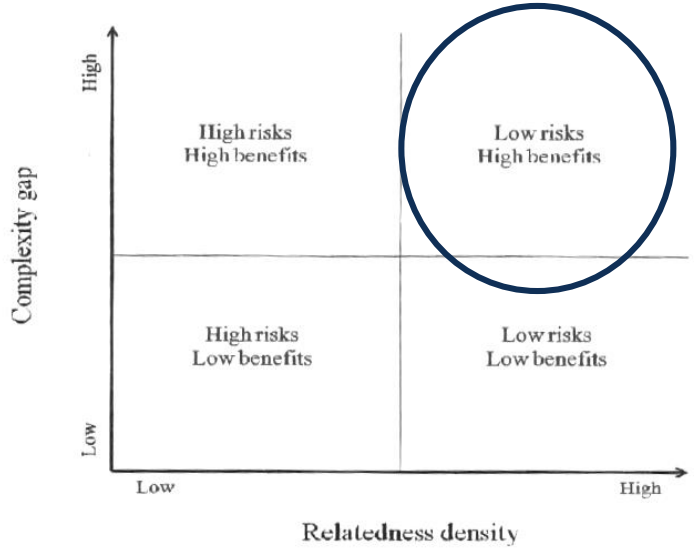
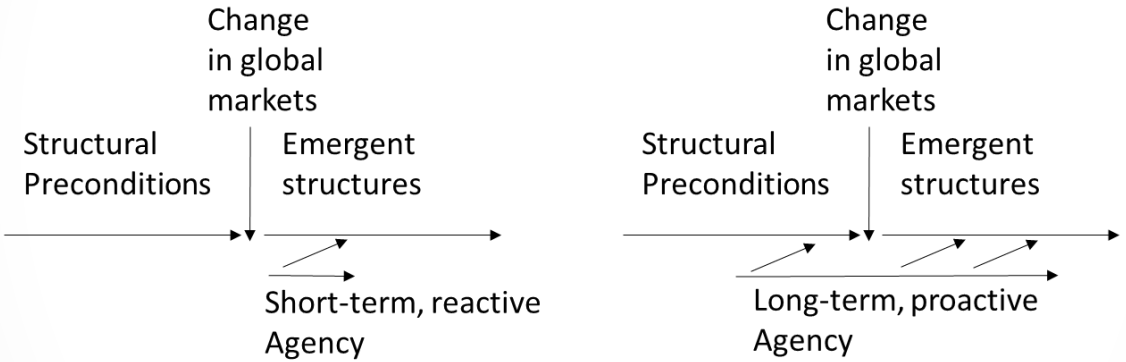
Balland et al. (2017) call the 'low risk/high benefit' alternative a *high road strategy* ... but the **transformative** potential is limited. The 'high risk/high benefit' alternative is considered to be a *high risk* (*casino) strategy*



Shortcomings of the related variety/diversification analyses and policy advices

- Predict the future based on empirical studies of the past. Historical analyses of industrial structural change
- Not questioning the relevance and accuracy of these analyses (even if the definition of relatedness can be a bit problematic)
- The problem and limitation of this approach lies in its narrowing of the scope of future windows of opportunity
- This is due to two factors: 1) an evolutionary approach is not based on a social ontology as it origins in a science approach; and 2) new technological development that cannot be read out of previous technologies
- This result in an underestimation of the role and potential of agency as represented by e.g. the trinity of agency approach as well as new technological developments such as different KET

Short-term and long-term agency



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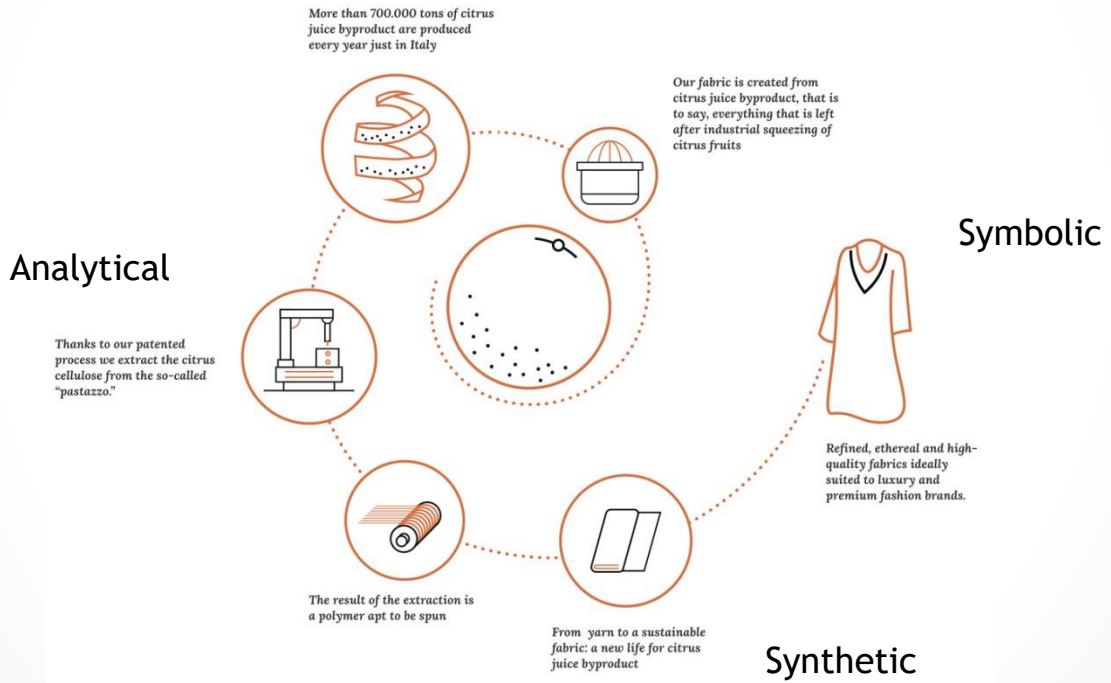
Unrelated diversification

- Unrelated diversification tends to happen at an intermediary stage of economic development, and when countries have higher levels of human capital (e.g. South Korea in the 1980s) (Pinheiro et al., 2018)
- Other research has found that increased innovation capacity leads to reduced importance of relatedness for industrial diversification (Xiao et al., 2018)
- '... high innovation capacity allows an economy to break from its past and to develop truly new industrial specialisations' (i.e. unrelated diversification and new path creation)
- '... Innovation capacity as a critical factor for economic resilience and diversification capacity'

Differentiated knowledge bases: A typology

Analytical (science based)	*Synthetic* (*engineering based*)	*Symbolic* (art based)
Developing new know-ledge about natural systems by applying scientific laws; *know why*	*Applying or combining existing knowledge in new ways; know how*	Creating meaning, desire, aesthetic qualities, affect, intangibles, symbols, images; *know who*
Scientific knowledge, models, deductive	*Problem-solving, custom production, inductive*	Creative process
Collaboration within and between research units	*Interactive learning with customers and suppliers*	Experimentation in studios and project teams
Strong codified knowledge content, highly abstract, universal	*Partially codified knowledge, strong tacit component, more context-specific*	Importance of interpretation, creativity, cultural knowledge, sign values, implies strong context specificity
Meaning relatively constant between places	*Meaning varies substantially between places*	Meaning highly variable between place, class and gender
Drug development	*Mechanical engineering*	Cultural production, design, brands

Unrelated variety/knowledge combinations



Source: www.orangefiber.it

Related and unrelated diversification

Knowledge/ competence Sector/market	Related	Unrelated
Related	***Related diversification (EEG)*** regional branching	***Unrelated diversification (KB)*** functional food, technical textiles/technical shoes – (biotech/nanotech as KET)
Unrelated	***Unrelated diversification (KB/EEG)*** Ski to aviation (composite material) (Fischer) Pumps & pipes (knowledge from oil and gas industry to healthcare industry)	***New path creation*** (KB) Aircraft industry using composite material

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Where to find unrelated diversification

- *Related sectors – unrelated knowledge (unrelated diversification)*
  - functional food (Sweden, the Netherlands, Thailand)
  - functional textiles/functional shoes (Sweden, Portugal)
- *Unrelated sectors – related knowledge (unrelated diversification)*
  - ski to aviation (composite material) (Austria)
  - knowledge from oil and gas to healthcare industry (Norway)

Unrelated sectors – unrelated knowledge (new path creation)

- aircraft industry (composite material) (UAE)

): *Unrelated diversification/new path creation* are options not only for/in high developed countries/regions but also to be found in moderate innovative regions (e.g. in Portugal) and middle income countries (e.g (Northern) Thailand)

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Innovation policy requirements

- Build strong **complementarities** between supply side (research funding, system formation) and demand side intervention (e.g. public procurement, market regulation)
- Institutional conditions and policies supportive of local learning from global networks (e.g. Fitjar & Rodriques-Pose, 2013) are **particularly important for exploration of 'unrelated knowledge combinations'**
- The importance of **industry intramural RD&I efforts** for new capability building and radical innovation (e.g. Cassiman & Veugelers, 2006; Añón Higón, 2016; Herstad, 2017)

Unrelated knowledge combinations and new path creation: Towards a policy agenda

- Three basic functions need to be served to approach the complex question of policy design and implementation supportive of unrelated diversification/knowledge combinations and new path creation:

1. Exploration of new opportunities, as captured by the concept of 'entrepreneurial discovery process' in smart specialisation
2. Anchoring and upscaling of new activities. New path creation only come about when new activities grow large enough to redefine what are 'related' industries in an economy
3. Need for policy experimentation and coordination under conditions where failure must be legitimate, success must be determined by the cumulative impacts of different projects, where learning and adjustment are essential

Thanks for the attention

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See also two books by **Asheim, Isaksen and Trippl**, published by Edward Elgar, 2019:

An Advanced Introduction to Regional Innovation Systems; and *Regional Economic Advantage*. The International Library of Critical Writings in Economics 363

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