The economic impact assessment of entrepreneurial ideas in the Smart Specialisation Policy: illustrative policy simulations in Baranya county

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Outline

- Introduction
- Economic impact assessment in prioritization
- The challenges in modeling the likely economic impacts of a new activity
- A regional case studies: ex-ante impact modeling of a selected new activity in the city of Pécs
- Summary

Introduction

- Prioritization is key in S3 – but implementation is a problem
- In the prioritization process the government selects from alternative domains (activities) for policy support
  - Which activity to support?
  - What are the policy instruments to be applied to support the activity?
  - How much public money to spend for the support of each the activity's introduction?
- Dimensions of prioritization (Foray 2015):
  1. the activity's individual features (degree of novelty, the extent to which it targets new regional opportunities, availability of regional supply factors)
  2. its regional spillover capacity to generate firm concentration
  3. economic significance of the new activity
- Economic significance of the new activity: this presentation argues for the necessity to involve economic impact models in the prioritization process
- Concrete economic impact assessment exercises are carried out for two selected new activities in the city of Pécs

Research questions

- How can we contribute to the prioritization process? How can we survey pontential ideas?
- What ‚entrepreneurial discoveries' contribute the most to regional growth?
- How can we select among many alternative ideas?
- What are the cost and the benefits of investing in different ideas?

Economic impact assessment in prioritization

- The suggested approach for economic impact assessment in the smart specialization literature:
  - ‘estimation of direct and indirect resource inputs from both the private and public sector suppliers’ (Foray et al. 2011, p. 13)
- However the suggested approach covers impacts only partially since a new activity
  - might require investments in the region inducing further investments in other sectors in the region and in other regions
  - results in changes in regional employment in the new sector and other sectors in the region and in other regions
  - investment and production requires intermediate production inputs from the region and other regions
  - increased capital and labor income involves income multiplier effects in the region and in other regions
  - goods and factor prices might change that might result in substitutions of regional products with imports from other regions or countries,
  - migration impacts, etc.
- Therefore the introduction of a new activity will result in various, mutually interconnected changes in the economy of the region as well as the economies of other regions

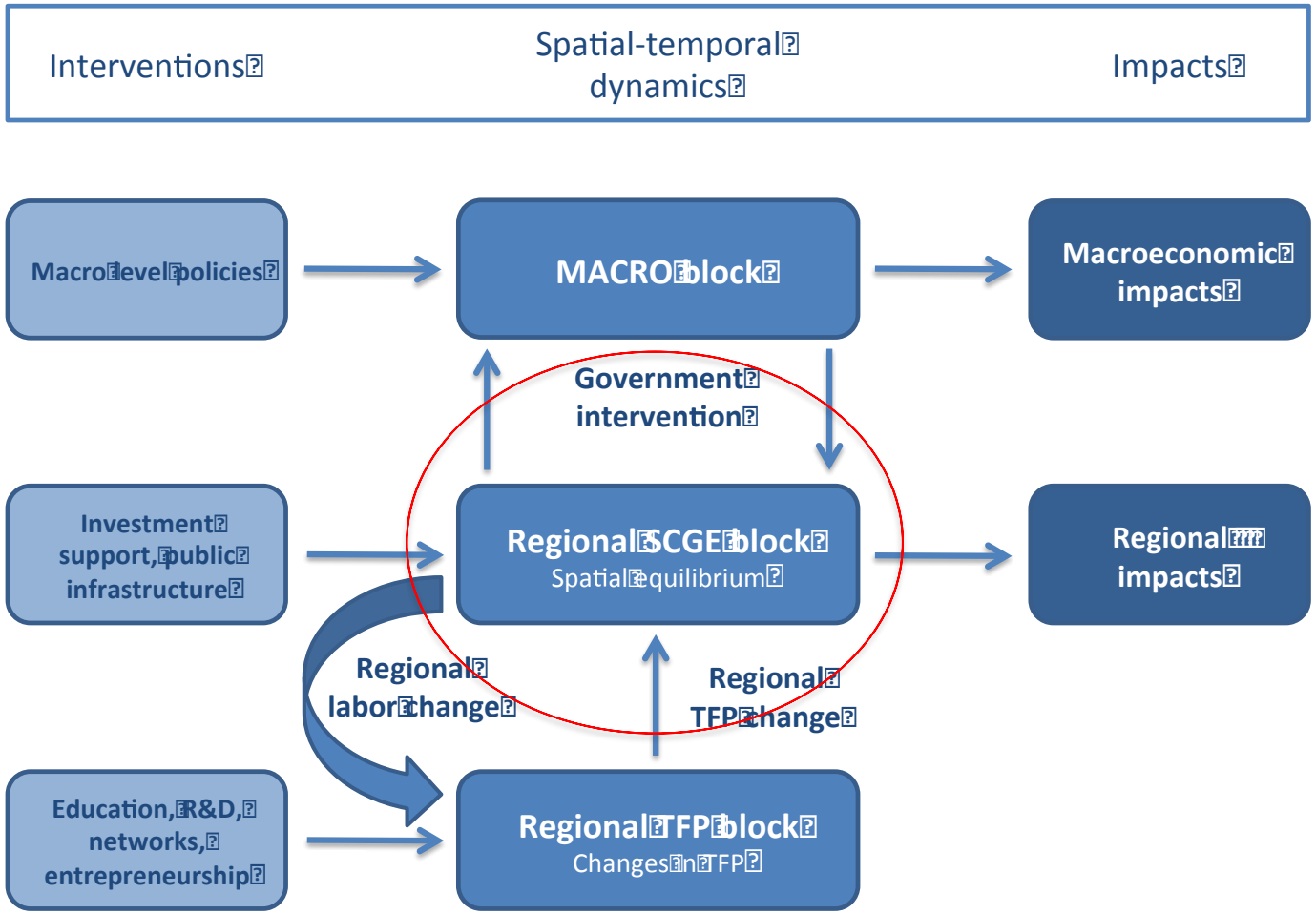
What features are necessary in an impact model?

- Economic impact models could potentially be useful in the estimation of the various economic impacts of a new activity
- Suitable economic impact models should incorporate
  - the regional dimension (S3 interventions address regional development)
  - interregional interactions (trade, migration, technology spillovers)
  - the industrial dimension of the regional economy (S3 interventions address selected industrial sectors)
- With the application of multi-regional (20), multi-sectoral (37) models the economic impacts of different new activities may become comparable

The model applied in assessment: The GMR-Hungary model

- GMR: Geographic Macro and Regional model
- GMR-models: EcoRET model (Varga, Schalk 2004), GMR-Hungary (Varga 2007, Varga, Járosi, Sebestyén 2013), GMR-Europe (Varga 2017, Varga, Sebestyén, Szabó, Szeb 2018), GMR-Turkey (Varga, Baypinar 2016)
- Selected applications:
  - Cohesion Policy impact assessment for the Hungarian government (since 2004 continuously)
  - Cohesion Policy impact assessment for the European Commission (DG Regio, 2011)
  - FP6 impact assessment (2010)
  - Policy impact assessments for Turkish regions (2014)

The model applied in assessment: The GMR-Hungary model



How can we enumerate the expected impacts of a ‚new sector'?

- The solution we followed:
  - We added a new sector which produces this output in an existing model (since the new activity results in new output)
  - The impact is the direct effects of starting a new activity + the reaction of other actors to the presence of the new activity

- How to get the data to model the new sector?
  - The initial model is based on Hungarian Statistical Office data
  - In the case of the new sector the necessary information is collected via interviews

A regional case study

The ex-ante impact modeling of the introduction of selected new activities in the city of Pécs

Screening for potential domains 1: Some of the innovative firms in the region

- Soft Flow – biotechnology, R&D
  - Flow cytometry, antibodies, toxi-watch mycotoxin
  - Nish market, highly specialized, global buyers, global suppliers, University's necessity is limited
- Games for Business – software, B2B
  - Recruitment, HR development software using gamification methods
  - Regional (Budapest), global buyers, human resource (most important) is available via freelancer channels
- Rati – car interior product development
  - Supplier of car interior for global players (Renault, Audi, VW)
  - Supply of semi finished products from China, local human resource for assembly, industrial design capacity from Budapest (despite of the fact that the University has such potential)
- Peerbike – innovative electric bike development and production
  - Export oriented activity, nish market, R&D potential, social network potential

Screening for potential domains 2: Some of the innovative firms in the region

- New grape cultivars with durable disease resistance – Institute of Viticulture and Oenology
  - New grape cultivars with durable disease resistance that allows significant reduction of insecticides, suitable for organic wine growing
  - Obstacles: long process (still 3-4 years to get all licenses); regional spillover and transformation effects are not evident
- 3D printing, rehabilitation robotics development, medical equipments – 3D Print Project Center Medical working group
  - Design and development of experimental medical equipment, prototypes, e.g. rehabilitation robotics development, design and manufacturing of medical simulation equipment
  - Obstacles: the projects are in initial phase, lack of focus
- Biotechnology and biopharmacology – School of Pharmacy, School of Medicine, SZRC, 3D PPC
  - Many promising research avenues ranging from anti-inflamatory drugs to cancer treatment
  - Obstacles: regional spillover and transformation effects are not evident owing to high level of internationalization

The activities selected for assessment

I. 3D Bioprinting of cartilage for sport injuries

- Special area of 3D printing
- Fat cells of the patients are used to grow the personally customized cartilage
- High value added compared to traditional treatments by full costumization and relatively short period of recovery to loadability that is of utmost importance in sport
- Expertise in research and surgery are present at the University of Pécs
- Potential spillovers into other sectors (tourism, insurance, transportation services etc.)

II. E-bike manufacturing

- Highly custumizable electronic bikes
- Radical design, high quality
- Innovative accessories
- Social media connection
- Strong local connection to suppliers (manufacturing)
- Potential collaboration with the Faculty of Engineering

Shocks associated with the new sectors

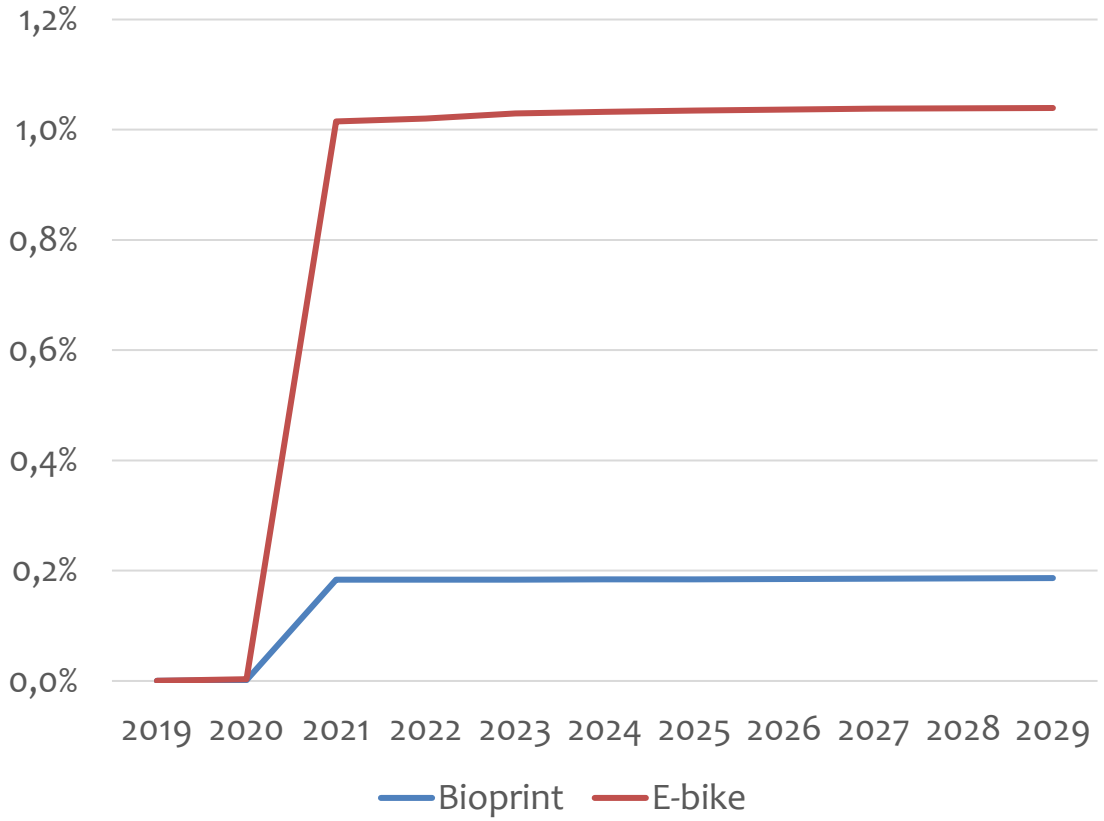
I. 3D Bioprinting of cartilage for sport injuries

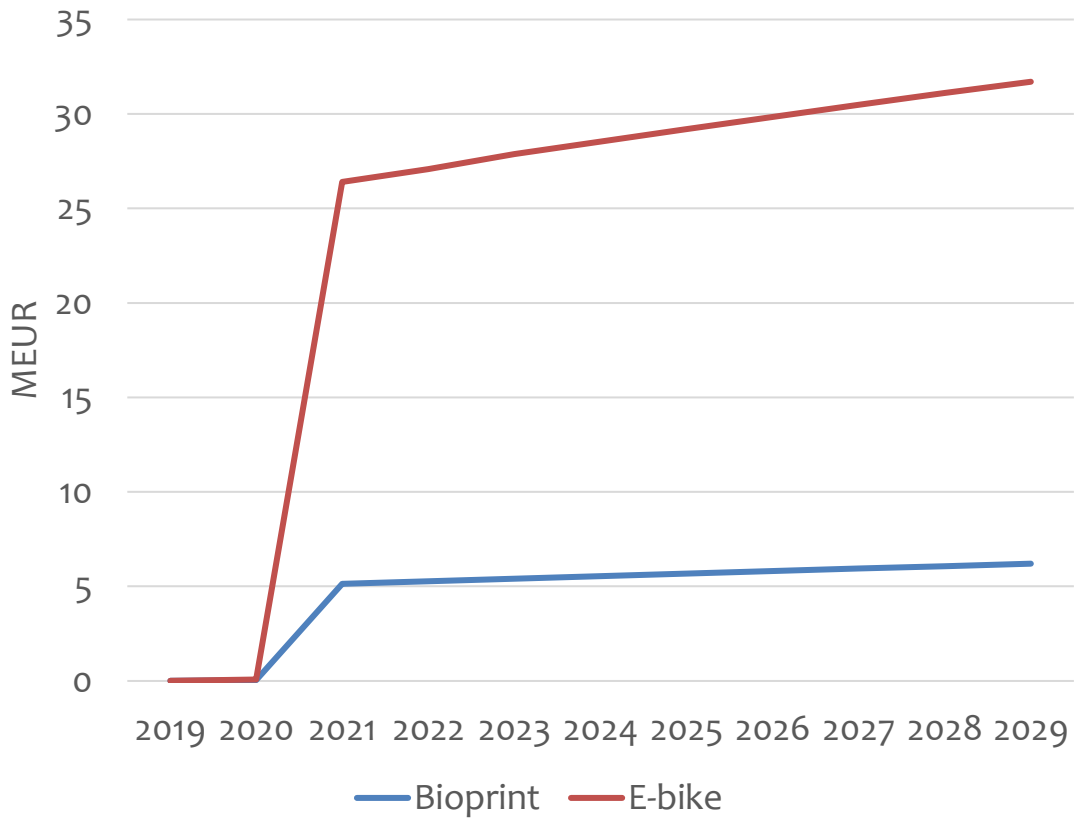
- Scenario: 1000 patients per year (full capacity utilization)
- Investment in the new sector in 2020 (equipment, construction): 2.6 million EUR
  - Source: foreign grant (e.g. EU funds)
- Consumption shock (of the new sector) between 2021-2029: 4.9 million EUR (annually)
  - Source: foreign patients (1000 patients per a year)
- Tourism shock between 2021-2029: 1.7 million EUR (annually)
  - Source: foreign patients (1000 people – staying for 4-13 days per visit)

II. E-bike manufacturing

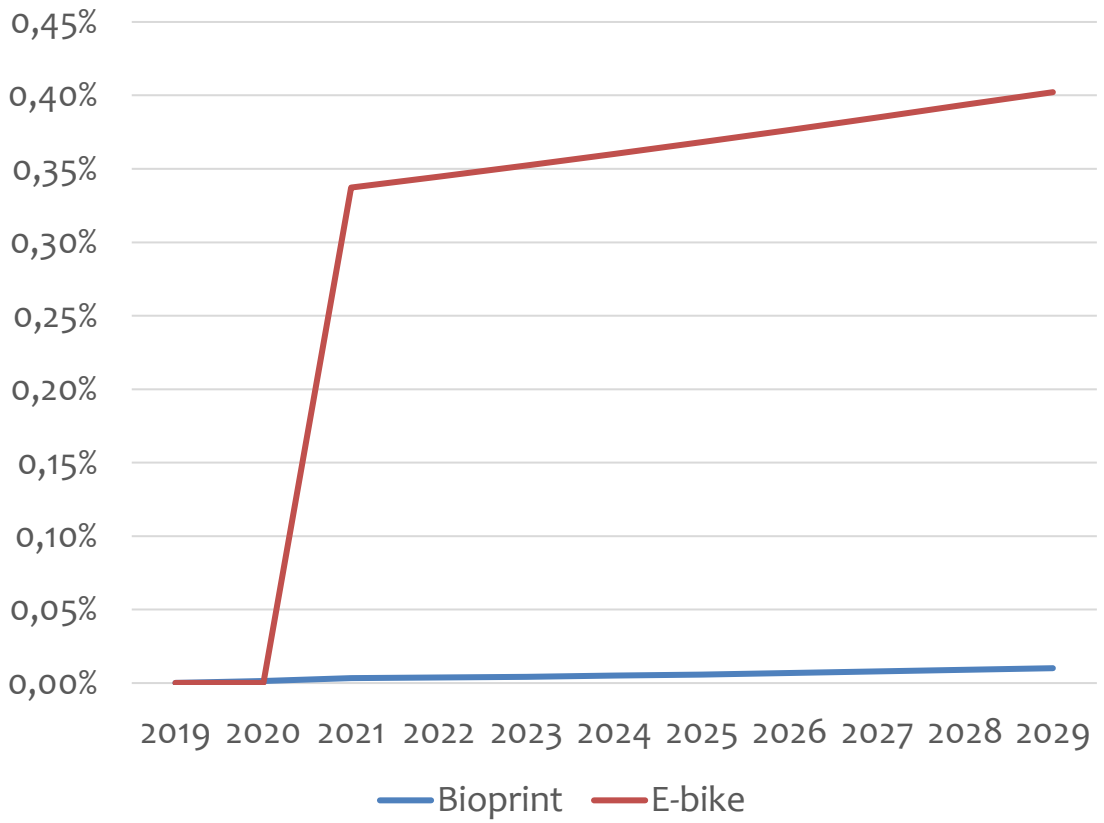
- Scenario: 15000 units sold annually
- Investment in the new sector in 2020 (equipment, construction): 6.7 million EUR
  - Source: foreign grant (e.g. EU funds)

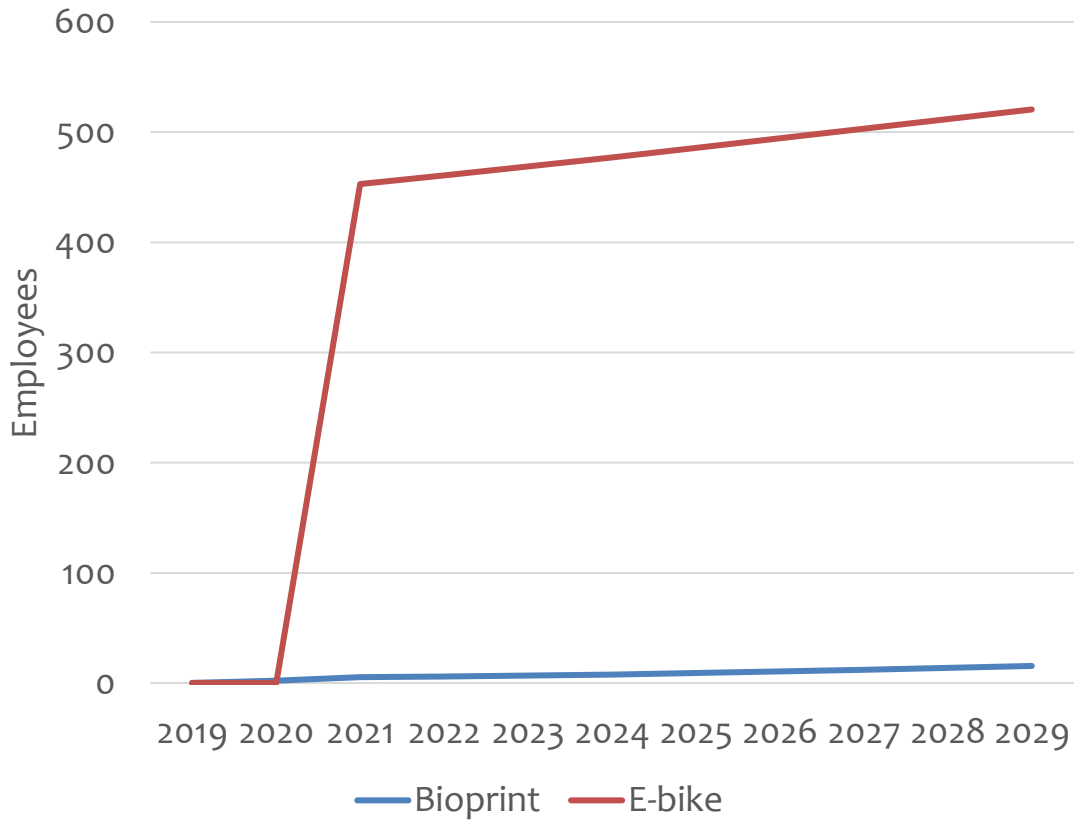
Impacts on output





Impacts on employment





Which industry to select? Cost-Benefit analysis

- Basis of selection:
  - Average economic results achieved by one unit of investment

	Bioprinting	E-bike
GDP-multiplier	1.94	3.9
Employment-multiplier	3.35	65.2

Plans for further developments

- Impact analyses of alternative scenarios
- Economic impact assessment of the policy interventions to improve regional conditions for increasing the new activity's spillover capacity (generating new firm formation)
  - Entrepreneurship development
  - Human capital development
  - Improving physical accessibility
  - Increasing R&D activity
  - Improving the access to interregional knowledge networks
- Impact analyses for additional new activities