Policy modelling between “what if?” and “so what?”

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• Policy modelling – asking what-if questions for decision support
  • Example 1: DG INFSO Horizon2020 study
  • Example 2: Irish Government innovation policy simulation study
  • Summary
• Policy modelling – receiving so-what responses from many involved
  • Example 1: DG INFSO Horizon2020 study
  • Example 2: Irish Government innovation policy simulation study
  • Summary
• Managing the tension between „what if?“ and „so what?“
implementation risks for new policies

• no linearity between the policy measure and its desired effect
• analytical approaches trying to offer guidance and support have to acknowledge that any forecasts and predictions on policy success or failure are difficult if not impossible
• Real-world implementation can be expensive, if it turns out to be a failure
  • production and roll-out costs
  • might even prove to be harmful and lead to some un-intended, very costly side-effects
  • time and efforts wasted on the failure, might have been better used for a potentially more appropriate policy change
Policy modelling
asking what-if questions for decision support

• Modelling and simulation can shed light into the darkness of the future (coping with the challenges of complexity, understanding the dynamics of the social systems), identifying potential access points for successful intervention

• Asking what-if questions (ex-ante evaluation) - an option that is normally not easily available in the policy-making world

• Stakeholders can use scenario modelling as a worksite for their ‘reality constructions’

• Experiments can be used to give an indication of the likely effect of a wide variety of policy measures

• Empirical ‘Un-observables’, such as knowledge flows in innovation or learning of agents, can be measured
Example 1:

DG INFSO Horizon2020 study
Policy impact simulation in R&D policy

• “Policy impact simulation. An important goal of evaluation research is to make evaluations relevant to policy options for intervention in RTD and innovation. Evaluations must relate observed parameters and impacts to the characteristics of the intervention. It must be possible to deduce what could and should be changed in the intervention to improve impacts. Accordingly, much more use should be made of ex-ante network analysis to simulate the impacts of intervention policy changes.”

Policy modelling workflow

Step 1:
1. Lab Users: Policy action areas & evaluative questions
2. Dataset for the Lab
3. Starting networks
4. Calibration
5. Simulation experiments
6. Adapting the SKIN model

Step 2:
1. Simulation database
2. Reproducing existing policies
3. Exploring policy scenarios
4. Further evaluative questions

Step 3:
1. Impact assessment and Ex-ante evaluation
2. Policy options & evaluative answers
3. Lab Users: Interaction with data
4. Visualisation

Quantitative analyses:
- Knowledge profiles
- Maps of concrete networks
- Behaviours & strategies

Qualitative analyses:
- Decision contexts
- D2M
- Mapping
- Agents

"Lab Experience"
What if?
Negotiating the policy questions

• The Tender specification described the intended questions in detail, but the stakeholder group (the ‘clients’)
  • worked out the meaning of these questions while they talked to us
  • dismissed the Tender questions and negotiated amongst each other for an alternative set
  • disagreed amongst themselves about which questions should be included, and about the priority of those included
  • did not fully understand the limitations of the methodology
The process to get us there

- **Scan written project specification** by client (in this case the Tender Specifications of DG INFSO) and identify the original set of questions
- **Do literature review** and context analysis for each question (policy background, scope, meaning etc.) to inform study team
- **Meet stakeholders to get their views** on written project specifications and their view on context of questions; inform the stakeholders about what the model is about, what it can and cannot do; discuss until stakeholder group and study team is “on the same page”
- **Evaluate meeting** and revise original set of questions if necessary (probably an iterative process between study team and different stakeholders individually where study team acts as coordinator and mediator of the process)
- **Meet stakeholders to discuss final set of questions**, get written consent on this, and get their hypotheses concerning potential answers and potential ways to address the questions
- **Evaluate meeting and develop experiments** that are able to operationalise the hypotheses and address the questions
- **Meet stakeholders and get their feedback** and consent that experiments meet questions/hypotheses
- **Evaluate meeting and refine experiment set-up** concerning final set of questions
1. What if there are no changes?

2. What if there are changes to the thematic areas?

3. What if there are changes to the instruments of funding?

4. What if there are interventions concerning the scope or outreach of funding?

5. What if there are interventions concerning the participation of certain actors in the network (e.g. SMEs)?
Tasks for setting up the simulation model

- Create a **model** of the European Research Area (ERA) in ICT under the 7th Framework Programme (done in NEMO for FP6)
- Do **empirical research** on the target (partly done in NEMO)
- Implement the **agent properties and behaviours** discovered in the research (partly done in NEMO)
- **Calibrate** model with FP6/FP7 **data**
- Let the model „reproduce“ FP7 (if possible validation features)
- Use this FP7 simulation as **baseline scenario** for all policy changes (**evaluative questions**) in Horizon 2020
Policy modelling workflow

Step 1

Lab Users: Policy action areas & evaluative questions

D2M → Dataset for the Lab → Starting networks → Calibration

Step 2

Simulation experiments

Adapting the SKIN model

Reproducing existing policies

Exploring policy scenarios

Step 3

Further evaluative questions

Lab Experience

Impact assessment and Ex-ante evaluation

Policy options & evaluative answers

"Lab Experience"

Qualitative analyses: Knowledge profiles, Decision contexts, Behaviours & strategies

Quantitative analyses: Mapping, Maps of concrete networks

Agents

Visualisation, Interaction with data

Lab Users
Data used in the model
Policy modelling workflow

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Step 2
- Simulation experiments
- Further evaluative questions
- Reproducing existing policies
- Exploring policy scenarios
- Impact assessment and Ex-ante evaluation

Step 3
- Lab Users
- Simulation database
- Interactive with data
- Visualisation

Quantitative analyses
- Knowledge profiles
- D2M
- Decision contexts
- Maps of concrete networks
- Behaviours & strategies

Qualitative analyses
- “Lab Experience”
- Lab Experience
- Policy options & evaluative answers

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Policy Modelling London 2014
Petra Ahrweiler
INFSO-SKIN flow diagram
Policy modelling workflow

Step 1

Lab Users: Policy action areas & evaluative questions → D2M → Dataset for the Lab → Starting networks → Calibration → Simulation experiments → Adapting the SKIN model

Step 2

Further evaluative questions → Lab Experience

Step 3

Simulation database → Reproducing existing policies → Exploring policy scenarios → Impact assessment and Ex-ante evaluation → Policy options & evaluative answers

Quantitative analyses:
- Knowledge profiles
- Mapping
- Maps of concrete networks
- Behaviours & strategies

Qualitative analyses:
- Decision contexts
- Agents
- Visualisation
- Interaction with data

"Lab Experience":
- Lab Users
- Agents
FP7 STREP network: real and simulated

Note that some features cannot be measured, or have not been included, in the empirical dataset.
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- Lab Users
- Visualisation
- Interaction with data
- Impact assessment and Ex-ante evaluation

**Step 3**
- Policy options & evaluative answers

**Qualitative analyses**
- Knowledge profiles
- Decision contexts
- Mapping
- Behaviours & strategies

**Quantitative analyses**
- Maps of concrete networks

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Example: Evaluative questions for Horizon 2020

1. What if there are no changes?
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European Commission
Information Society and Media
Policy background

• “Current EU funding programmes have put considerable effort in tackling societal challenges, **predominately through a thematic technology push**. Bringing researchers from across Europe together in collaborative networks has been at the heart of this approach and will continue to be vital in sustaining a European research fabric.”


• **Experiment question for the simulation:** Should one *reduce* thematic areas in an attempt to prioritise certain research challenges, or *extend* existing thematic breadth?
Results for
What-if we reduce/extend the number of funded themes?

Cumulative knowledge flow "Programme"

Baseline

More themes

Fewer themes
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Example: Evaluative questions for Horizon 2020

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European Commission
Information Society and Media
Findings:

• No effect on the number of participants, number of proposals and the number of projects.

• A moderate increase in the scope of the calls does not affect the network structure.

• However, decreasing the scope has a negative impact on knowledge flows.

Policy implications:

• New thematic areas could be easily integrated (or existing ones decreased) without very much impact on the overall network structure, the number of participants and the number of projects.

• The thematic scope of the programme would be a political decision. If the intended changes are moderate in scope, it is not likely that this will cause problems to already achieved targets such as the density and size of the networks.


• Final Report
So what?
Acquiring and satisfying the clients

- **Uptake** of modelling and simulation in the policy process (formation, making, evaluation) is *still in its infancy*

- **What about all these pre-implementation benefits?**

- **Where is the market/demand?**

- For the stakeholders to trust the model (and its results), they needed to:
  - understand the mechanisms represented in the model
  - feel that they have had an input into the design of the agent rules and characteristics
  - agree that the baseline simulations of FP7 were sufficiently close to what they observed had actually happened
  - be shown appealing visualisations and plots

- To be really happy, they wanted *‘recommendations’, not ‘findings’*
The modellers

- Most of the time, modellers deliver their findings and **never hear about them again**
- If the findings have been used, and **how** they have been used, remains the **secret** of their clients
- **Policy modelling is not policy making**
- Though this might be fine for those, who do not want to provide “policy recommendations” anyway, but just want to develop findings for decision support, it might lead to some general **discomfort** about opaque impacts.
- Not to see what exactly is done with one’s work, comes close to the assumption that **nothing** is done with it
- **Open questions**: What are the ultimate policy objectives for the European support of R&D? When were the policies being formulated and by whom?
Example 2:

Irish Government innovation policy simulation study
What if?
Irish national innovation system

Infrastructure:
Taxation and incentives; venture capital; IP strategy, internationalisation; transfer culture etc.

Irish R&D and Innovation policy
Research funding for high-potential areas, prioritisation (PRTLI, SFI, CSETS)

cTTO

Publicly financed Knowledge production
Research-intensive
Top universities, Little applied research

No research between science and industry (Fraunhofer)

Science Industry links (innovation networks)

Industry & services
MNEs
Little R&D
Little cooperation
Little Embedded

Indigenous SMEs
Little R&D
Med to low-tech

Demand
Consumers
(small indigenous industry)
MNEs producing for export

Incubators

Few spin-offs

De-centralised TTO models
Evaluative questions from Irish innovation policy

- **What if** the Irish government operates its research prioritisation scheme?
- **What if** new Fraunhofer-type research organisations are created in Ireland?
- **What if** a centralised “one-stop” TTO is created in Ireland?
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<th>SNA study on</th>
<th>Actors / nodes of interest</th>
<th>Links of interest between actors</th>
<th>Key attributes of nodes and links</th>
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<td>University-led R&amp;D collaborations in Centres for Science, Engineering &amp; Technology</td>
<td>Universities and industry partners</td>
<td>Collaborations in CSET and TC projects (^1)</td>
<td>Career profiles of researchers</td>
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<td>Irish patent-based innovation networks</td>
<td>Inventors, applicants and technology classes</td>
<td>Applicant-inventor, inventor-technology class, co-invention, co-application and co-classification links</td>
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<td>Technology transfer offices and university spin-offs</td>
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So what?
Satisfying the clients

• IPSE set up as a 5-years research programme, rather than a tender project: long duration prevented the uptake of the results
• Stakeholders took the opportunity for very generic discussions
• No agreement between stakeholders on evaluative questions
• Evaluative questions changed in the middle of the project, because policy was quicker than the project
• (Most of the) Stakeholders lost their jobs or retired in the course of the project
• Limited stakeholder feedback, no interaction between meetings
• UCD changed its management during the project lifetime (no push for innovation themes any longer)
In the end, “so-what” might not turn out to be the worst option, because policies following simulation outcome would put heavy weights on the shoulders of modellers who might see more limitations to their models than their clients who paid for good advice!
Managing the tension between „what if?“ and „so what?“
Managing the tension

What if

• Outline pre-implementation benefits
• Get the prediction stuff right
• Do not over-sell
• Showcase example projects
• Do market research to see what the clients really need
• Do agenda setting with funding programmes to allow policy modelling projects in
• Project organisation is key

So what

• Interaction with stakeholders is key
• Policy modelling is an area par excellence for co-design
• Validation issues are important: Try to organise a systematic check of simulated policies against empirically implemented policies (impact path)
• Clients should allow modellers to see how policies are actually formulated, implemented, and executed with or without relation to their model
THANK YOU!