MECHANISME DESIGN, SOCIALE INNOVATIE, EN SOCIAAL ONDERNE-MERSCHAP

UTRECHT
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PROPELLER OPEN INNOVATION

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Social innovation:
a framework (point of departure)

2 defining characteristics

1/ Must be structurally aimed at meeting a social need (social challenge), like tackling the multidimensional social problems of the most vulnerable groups in society

2/ Must involve a new or significantly improved product (good and/or service), process, marketing method, and/or organizational model

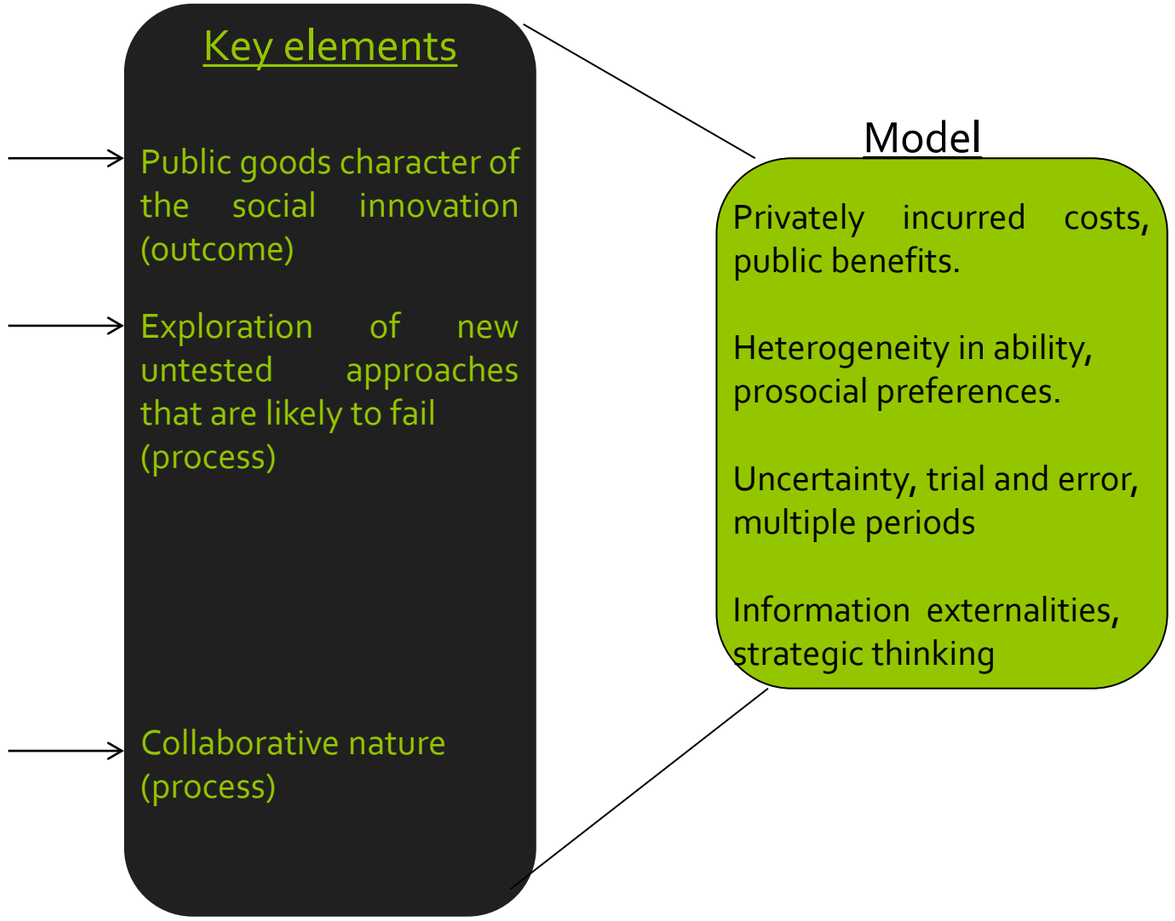
3 desirable characteristics

1/ Elaborates a medium and long-term vision for society or the desired future to which the innovation speaks

2/ Thinks boldly about how its immediate and medium-term impacts can be reliably measured and sustained

3/ Resourcefully connects different actors – be it citizens or professionals, with different backgrounds, (innovative) ideas, expertise, networks, resources; and in this process is concerned with emancipation, empowerment, and/or participation.

(Huysentruyt and Vrancken, 2012)



Focus of my talk:
how to motivate social innovative behavior

But first, let us consider a close relative of social innovation: Voluntary contributions to a public good [1/3]

Privately incurred costs, public benefits.

Heterogeneity in ability, prosocial preferences.

~~Uncertainty, trial and error, multiple periods~~

~~Information externalities~~, strategic thinking

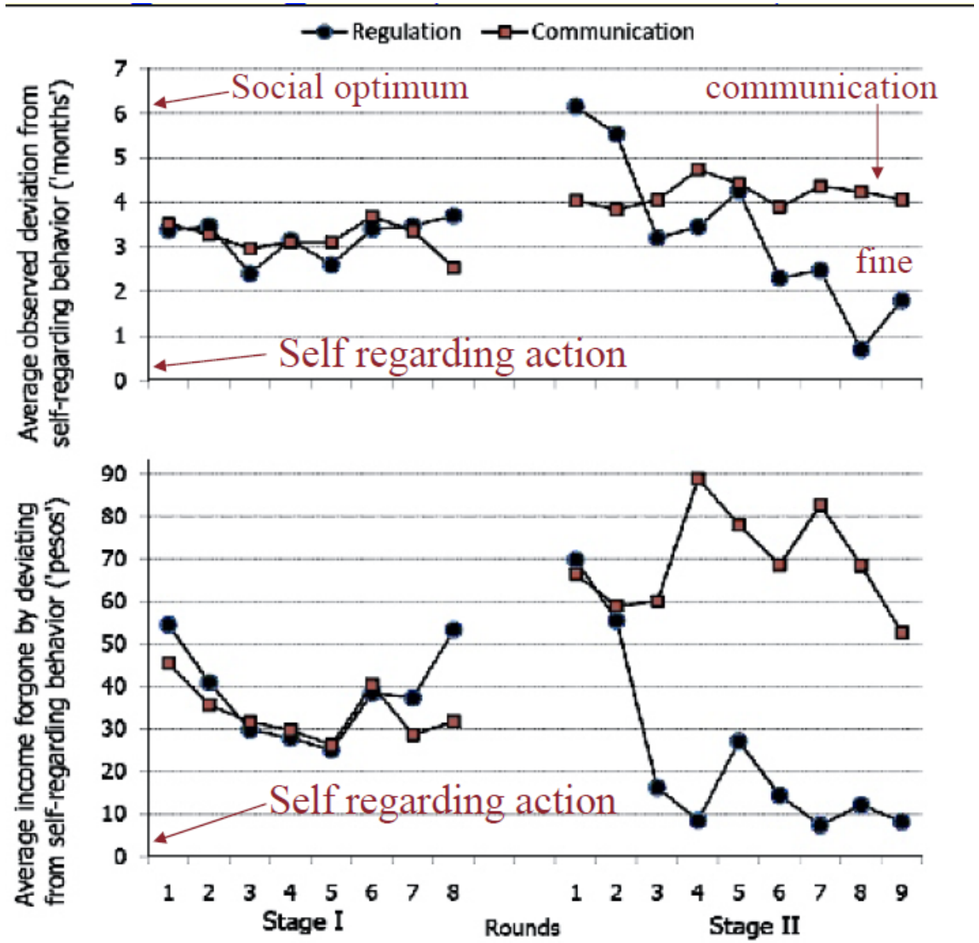
Findings (dictator game and voluntary contribution mechanism)

Nash equilibrium (zero contributions by all) is rarely observed, even if the situation is one-shot and completely anonymous , and so no punishment of free riders.

Peoples' beliefs about the behaviours of others and social preferences are critical determinants of contribution levels.

Economic motives and moral motives are not necessarily additive.

Interesting finding: Crowding out in a public goods game [2/3]



(Cardenas et al. , 2009; Bowles, 2008)

Subjects: rural Colombians

Public goods game with in stage II either (red) communication or fines (blue)

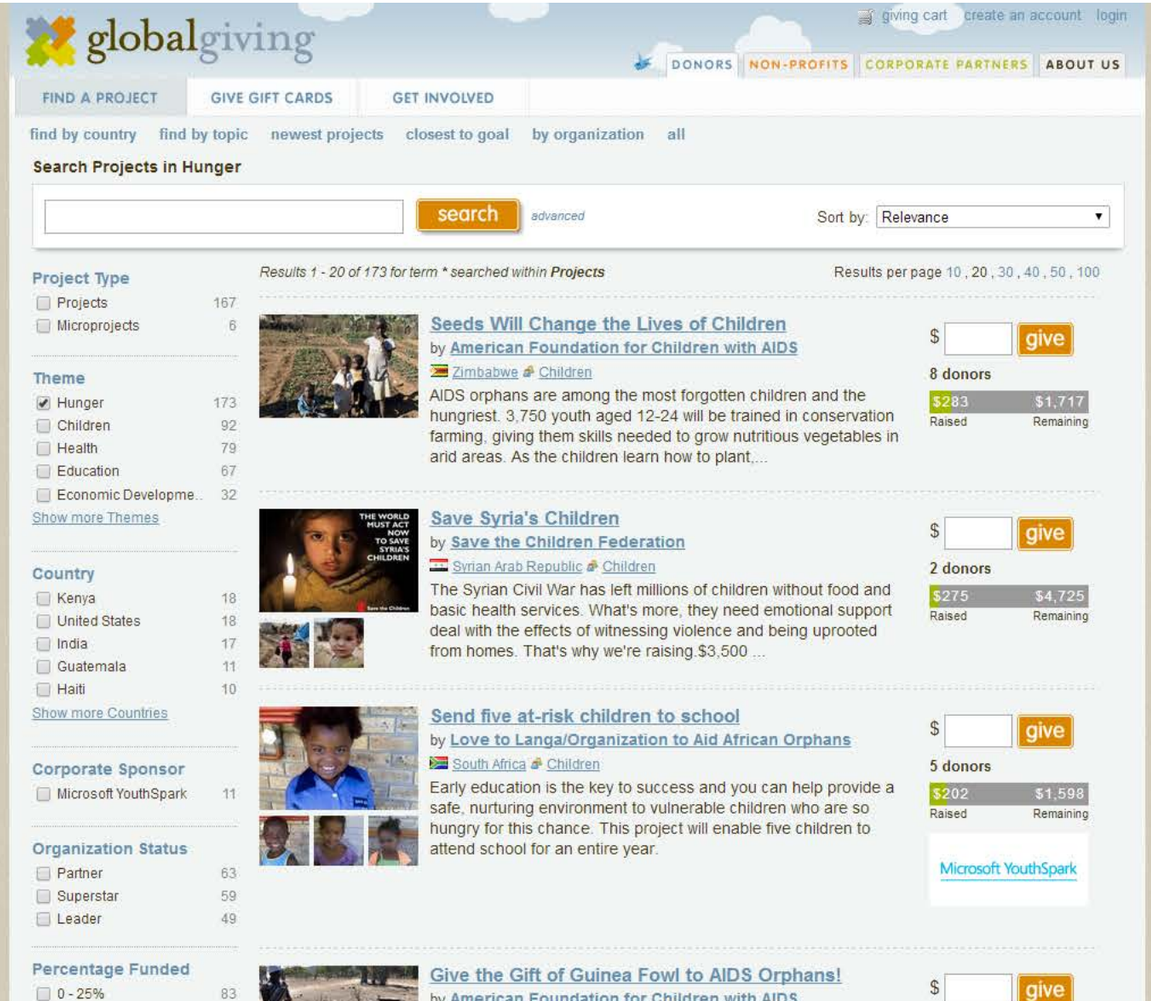
Top panel shows deviation from selfish actions

Bottom panel shows payoff sacrificed to protect the 'forest'

Challenge for next generation of mechanism designers:
Design policies and constitutions that support socially valued ends not only by harnessing selfish preferences to public ends but also by evoking, cultivating, and empowering public-spirited motives.

Real-life marketplace for ideas: GlobalGiving [3/3]

Voluntary contributions to a public good with contribution threshold



Set threshold strategically? Risk that fundraisers set this too high?

Identifiable recipient effect?

Precommit to future donations?

Pivotal giver?

Back to social innovation:
A model of exploration in partnership

Privately incurred costs, public benefits.

Heterogeneity in ability, prosocial preferences.

Uncertainty, trial and error,
multiple periods

Information externalities, strategic thinking

Illustrative example: Sequential exploration, uncertain returns to exploration

A unique prize is located in a single point on unit interval [0,1]
First mover chooses how large a share of options to explore a1 € [0,1]
Second player observes the exploration choice and its implied outcome and decides how large a graction of the unit interval to explore a2 € [0,1]. If prize is found, players receive alpha. The cost of exploration is gamma*ai, refraining from exploring incrus not cost.

Let's solve the subgame perfect equilibrium: suppose that the prize was not found in first stage. In the second stage, the expected payoff for player 2's exploration equals

$$\frac{\alpha}{1-a_1}a_2 - \gamma a_2$$

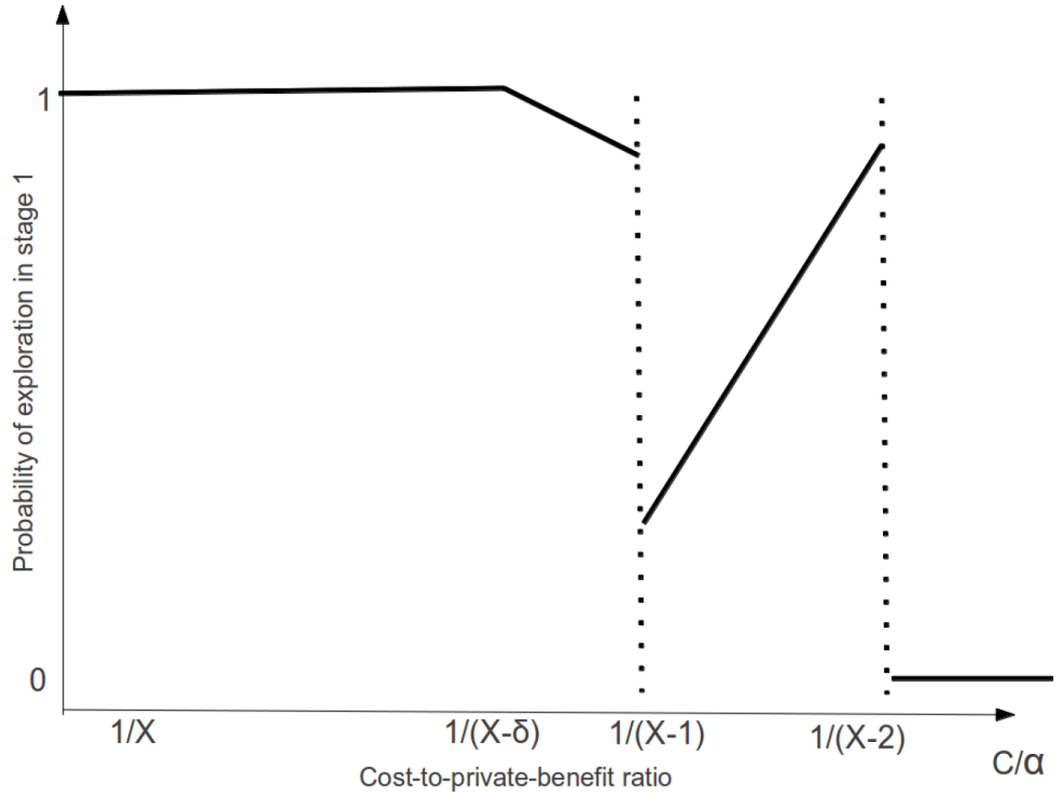
and thus player two decides to explore (all remaining alternatives) iff $a_1 \geq 1 - \alpha/\gamma$. Knowing this, player one explores precisely $a_1^* = max\{1 - \alpha/\gamma, 0\}$ alternatives if $\alpha - \gamma a_1^* \geq 0$, that is $2\alpha \geq \gamma$.

- The exploration of player two is increasing in α and decreasing in γ.
- The exploration of player one is decreasing in α and increasing in γ.
- The total amount of exploration is socially optimal.

(Huysentruyt, Miettinen and von Essen, 2014)

Intriguing non-monotonicity
best reply and equilibrium correspondences may be non-monotone

Non-monotonicity



Intuition (assuming two rounds)

Higher costs of exploration may include more exploration when there is a single alternative with high public value.

Second stage exploration can be promoted by first stage exploration.

Non-monotonicity implies that social surplus may increase as the unit cost of exploration increases;

(Huysentruyt, Miettinen and von Essen, 2014)

Uncertain versus certain returns to exploration

Privately incurred costs, public benefits.

Heterogeneity in ability, prosocial preferences.

~~Un~~certainty, trial and error,
multiple periods

Information externalities, strategic thinking

Illustrative example: Sequential exploration, certain returns to exploration (VCG)

Value alpha is uniformly spread over the unit interval such that the gross value of exploring all points equals alpha. Returns to exploration are certain. The marginal payoff to exploration equals apha – gamma, independent of the amount of previous exploration.
The second player explores if alpha ≥ gamma. The first player thus optimally choose a1 = 0.

- The player two is increasing in α and decreasing in γ.
- Player one never explores.
- The total amount of exploration is socially suboptimal if $2\alpha \geq \gamma > \alpha$.

What can be concluded from this simple example? When the benefits to exploration are uncertain and only associated with a fraction of the alternatives (yet the total benefits available coincide in the two cases), the incentives to explore are higher and the burden of generating the public good will be more evenly divided. When $\alpha \geq \gamma$, the total generated benefits are equal in the two cases. These are are given by $2\alpha - \gamma$. Yet, when $2\alpha \geq \gamma > \alpha$, the total generated benefit is higher when the benefits to exploration are uncertain than when they are certain. Exploration is always at socially optimal level with uncertain benefits; exploratio suboptimal with certain benefits, whenever $2\alpha \geq \gamma > \alpha$.

(Huysentruyt, Miettinen and von Essen,

Next step in this project: experimental design

(Huysentruyt, Miettinen and von Essen, 2014)

Let's consider another market mechanism designed to help solve thorny societal problems:

drawing out knowledge from diverse external sources to solve internal problems

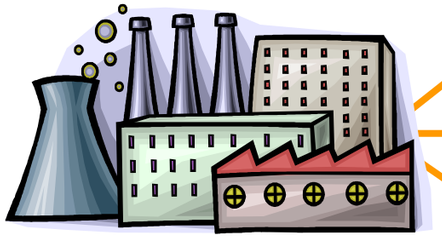
One avenue: Broadcast search

Problem seeker: defines the problem, solution criteria that will be used to judge success, time window, prize award (?), categorization of the challenge.

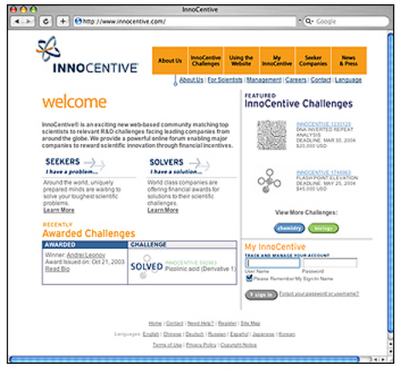
Problem solver: self-selects to make the decision to find out more about the problem, decides to submit a solution…

Winner-takes-all tournament

Real-life mechanism: Innocentive
Predominantly used for corporate science and technology challenges



R&D Labs of 26 firms, 10 countries, 8 industries (problem seekers)



Knowledge Broker

80,000 independent scientists (problem solvers)

2001-2011

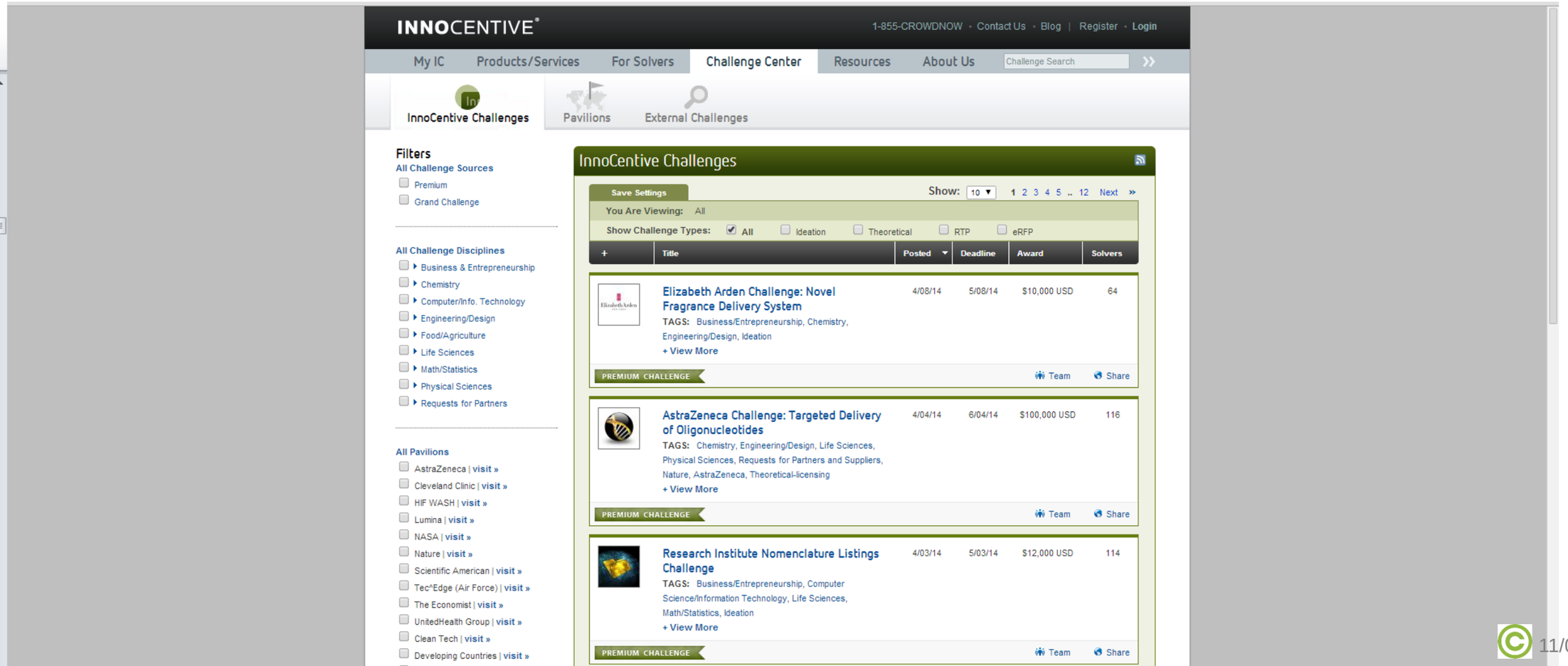
Total solvers and problems:

- 48,219 solvers
- 1,279 problems
- 265,602 Solver-Problem observations (based on all solvers entering project rooms)

Total submitted and winning solutions:

- 14,978 submitters
- 800 winners (incl. multiples)

This is how the innocentive webinterface looks like



Interesting finding: Marginality and problem-solving effectiveness in broadcast search

Table 4 Heckman Probit Model for Predicting Which Solver Submits a Winning Solution

	Model 1		Model 2		Model 3		Model 4	
Variables	Probit coefficient	Robust standard errors	Probit coefficient	Robust standard errors	Probit coefficient	Robust standard errors	Probit coefficient	Robust standard errors
Second stage: Solver winner								
Control variables								
Problem familiarity	0.029	0.052	0.075	0.057	0.038	0.051	0.086	0.055
Solver interest and problem discipline match	−0.069	0.174	−0.030	0.177	−0.067	0.172	−0.033	0.175
Scientific interest count	−0.009	0.008	−0.012	0.008	−0.011	0.007	−0.015	0.007*
Time invested (hours)	0.002	0.001***	0.002	0.001***	0.002	0.001***	0.002	0.001***
Constant	0.061	0.305	−0.339	0.371	0.031	0.316	−0.376	0.376
Independent variables								
Expertise distance			0.085	0.044*			0.087	0.045**
Gender (female = 1)					0.669	0.228***	0.671	0.231***
First stage: Submit a solution								
Gender (female = 1)	−0.158	0.087*	−0.156	0.087*	−0.195	0.088**	−0.195	0.088**
Ethnicity (Anglo-Saxon = 1)	−0.054	0.060	−0.051	0.060	−0.058	0.060	−0.055	0.060
Previous problems opened	0.078	0.008****	0.078	0.008****	0.078	0.008****	0.078	0.008****
Solver interest and problem discipline match	0.171	0.052***	0.171	0.052***	0.171	0.052***	0.171	0.052***
RTP solution requirement	−0.265	0.069***	−0.264	0.069***	−0.264	0.069***	−0.264	0.069****
Award value (log)	−0.158	0.032****	−0.158	0.032****	−0.158	0.032****	−0.158	0.032****
Constant	−0.653	0.294**	−0.658	0.294**	−0.648	0.294**	−0.656	0.293**
Selection correction term	−0.749	0.143****	−0.767	0.149****	−0.800	0.147****	−0.825	0.156****
Wald chi-square for independent equations:	27.54****		26.41****		32.20****		28.17****	
Number of observations (Stage 1): 12,786								
Number of censored observations: 12,466								
Number of uncensored observations (Stage 2): 320								

Notes. Standard errors are clustered by broadcast problems.
*p at 10%, **p at 5%, ***p at 1%, ****p at 0.1% significance.

166 science challenges, involving over 12,000 scientists.

Provision of a winning bid was positively related to increasing distance between the solver's field of technical expertise and the focal field of the problem.

Female solvers – known to be in the 'outer circle' of the scientific establishment – performed significantly better than man in developing successful solutions

(Jeppesen and Lakhani, 2010)

Broadcast search for solutions to societal challenges: real-world new evidence

Out of the 1279 problems, 9 % social challenges (not corporate science and technology)

Reduce Infant Mortality by Fortifying Staple Foods with Folic Acid at the Home or Community Level
100% Plant Oil Stove
Solar-powered wireless routers
Reducing the Fat Content of Fried Snacks
Make Water from Lake Victoria Safe to Drink
The Economist-InnoCentive Challenge on 21st Century Cyber Schools
Improving Banking Processes in the Developing World
Branchless Banking All-In-One Device …

Focus

1. Who are the social problem solvers? Do the pools of technological/science and social problem solvers overlap?
2. What motivates individuals to engage in social problem solving? How much are individuals 'willing to pay' to solve social problems?
3. How much do award amounts matter for: (i) Whether social problems are solved? (ii) The diversity of the solver pool (in terms of expertise)

(Ganguli and Huysentruyt)

Very preliminary results

- Almost 15% of solvers entered both a social and a tech project room at some point in the same month-year
- Social challenges **entered** at similar time have lower award value (Using solver-month-year fixed effects for both types of project rooms opened in same month-year)
- Social challenge **submissions** at a similar time have lower award value (Using solver-month-year fixed effects for both types of project rooms opened in same month-year)

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xi: areg ln_award submit_social social submit prev_probs prev_subs if both_pr==1,
absorb(solv_month_yr_id) vce(cluster personid)

Linear regression, absorbing indicators          Number of obs   =      43125
                                                 F(   5,   6442) =     232.54
                                                 Prob > F        =     0.0000
                                                 R-squared       =     0.3882
                                                 Adj R-squared   =     0.1820
                                                 Root MSE        =     1.1210

                                (Std. Err. adjusted for 6443 clusters in personid)
------------------------------------------------------------------------------
             |               Robust
    ln_award |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
submit_social |  -.2304151   .0739173    -3.12   0.002    -.3753176   -.0855126
      social |  -.5728638   .0188498   -30.39   0.000    -.6098157   -.5359119
      submit |  -.1986354    .034608    -5.74   0.000    -.2664786   -.1307922
  prev_probs |  -.0044864   .0031784    -1.41   0.158    -.0107171    .0017442
   prev_subs |   .0273384   .0130563     2.09   0.036     .0017437     .052933
       _cons |    5.39617   .0948752    56.88   0.000     5.210183    5.582157
-------------+----------------------------------------------------------------
solv_month ~d |   absorbed                                     (10865 categories)
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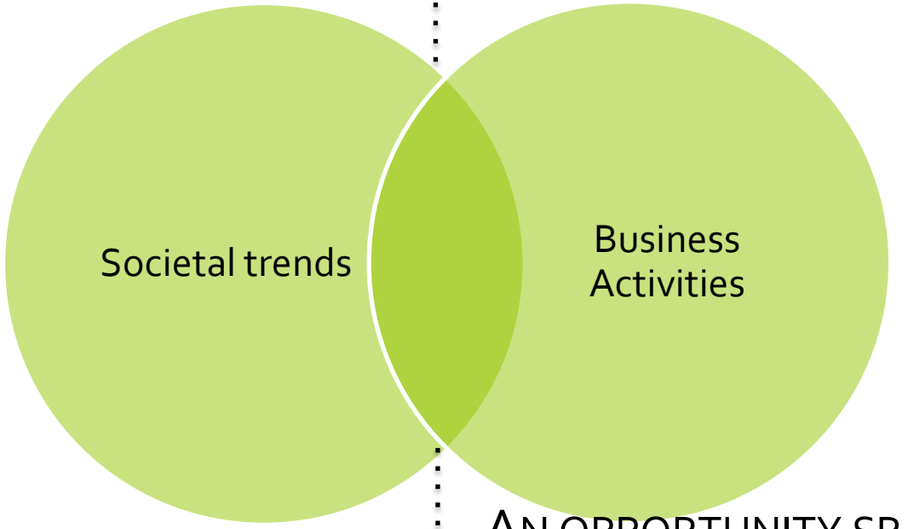
(Ganguli and Huysentruyt)

Another practical example: i-propeller

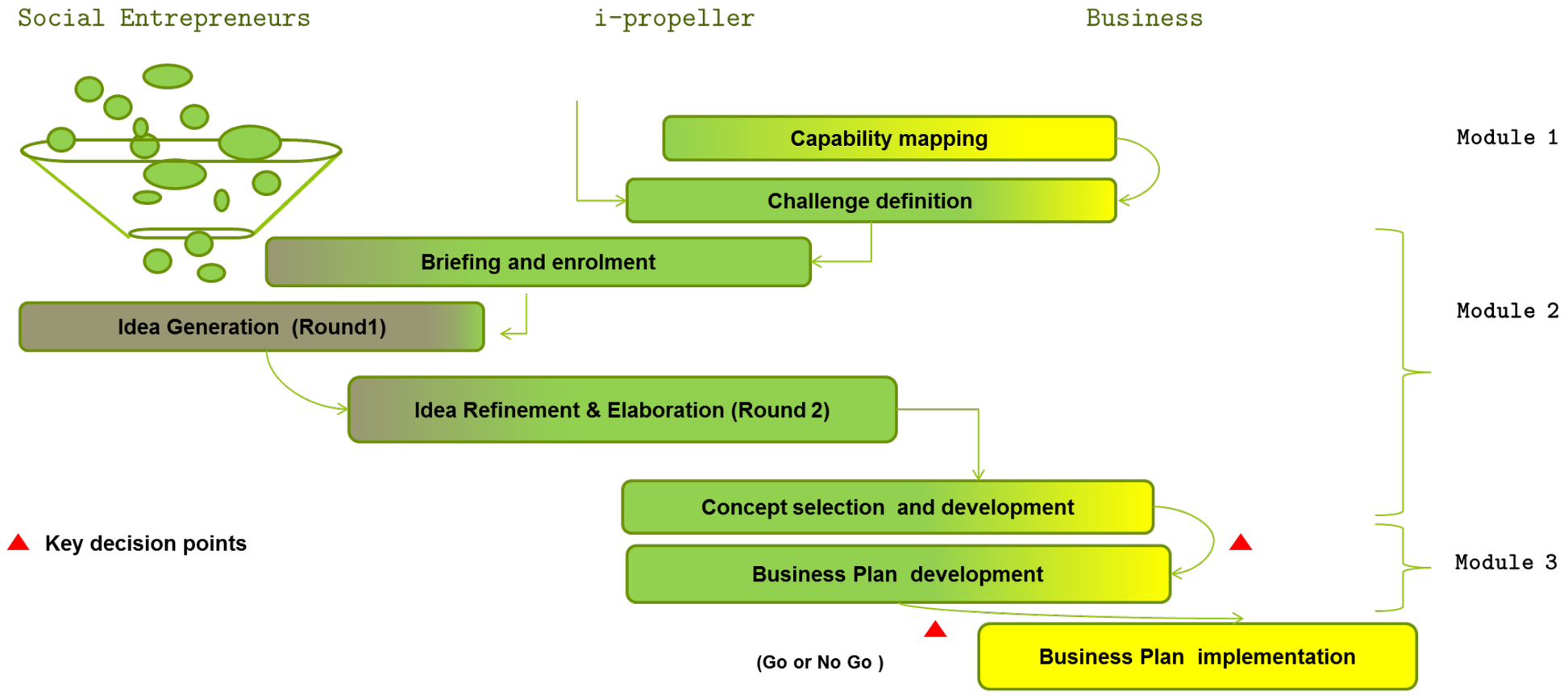
a boutique consultancy specialised in social business innovation and shared value strategy development

THE INTERSECTION OF SOCIAL AND ECONOMIC IMPACT



AN OPPORTUNITY SPACE FOR INNOVATION AND GROWTH

A structured crowd-sourcing mechanism put into practice: overview



Evidence showing the unique value that social enterprises bring in such a structured crowd-sourcing process

Evidence from a field experiment: Corporate social business innovation opportunity identification

Ideas crowd-sourced from social entrepreneurs (SE) differ from those that a company can access internally.

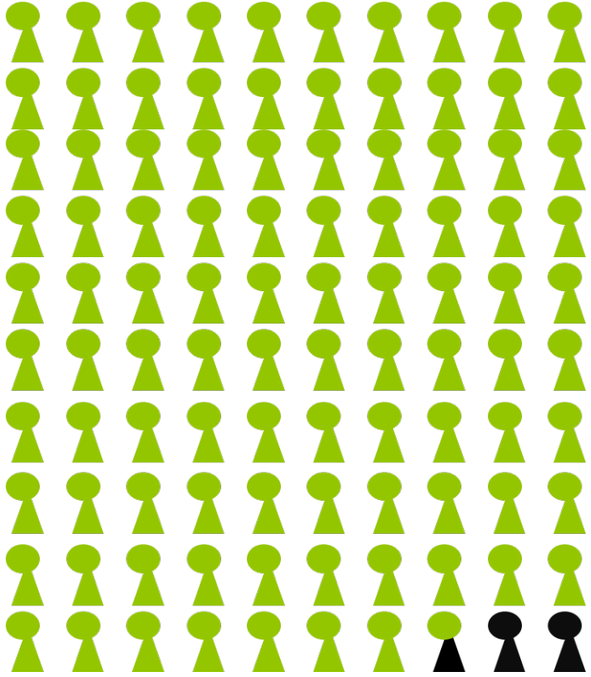
Relative to corporate employees, SE delivered more integrative ideas - particularly incentivizing green employee behavior

Both idea content and creativity are meaningfully associated with SE and employee values.

(Huysentruyt, Stephan, Van Looy, 2012)

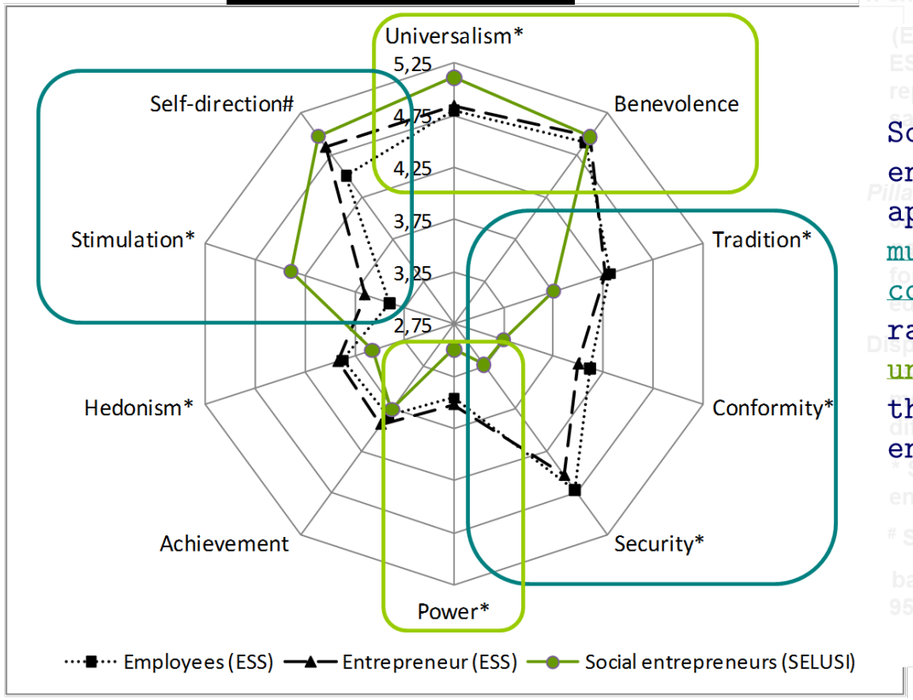
Introducing social enterprises more carefully frontrunners in social innovation (?)

Worldwide 2,8 % of people aged are involved in early-stage social entrepreneurial activity
(Global Entrepreneurship Monitor, 2010)



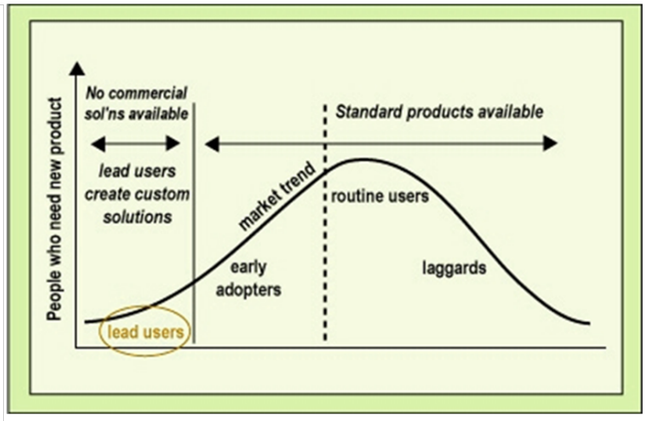
With their distinct value profile – strong universalist and nonconformist values, social enterprises have been found to be more sensitive - and responsive - to social market needs.

DISTINCT VALUE PROFILE



Social entrepreneurs appear to be much less conformist and radically more universalist than mainstream entrepreneurs

IDENTIFY AND RESPOND TO CONSUMER NEEDS

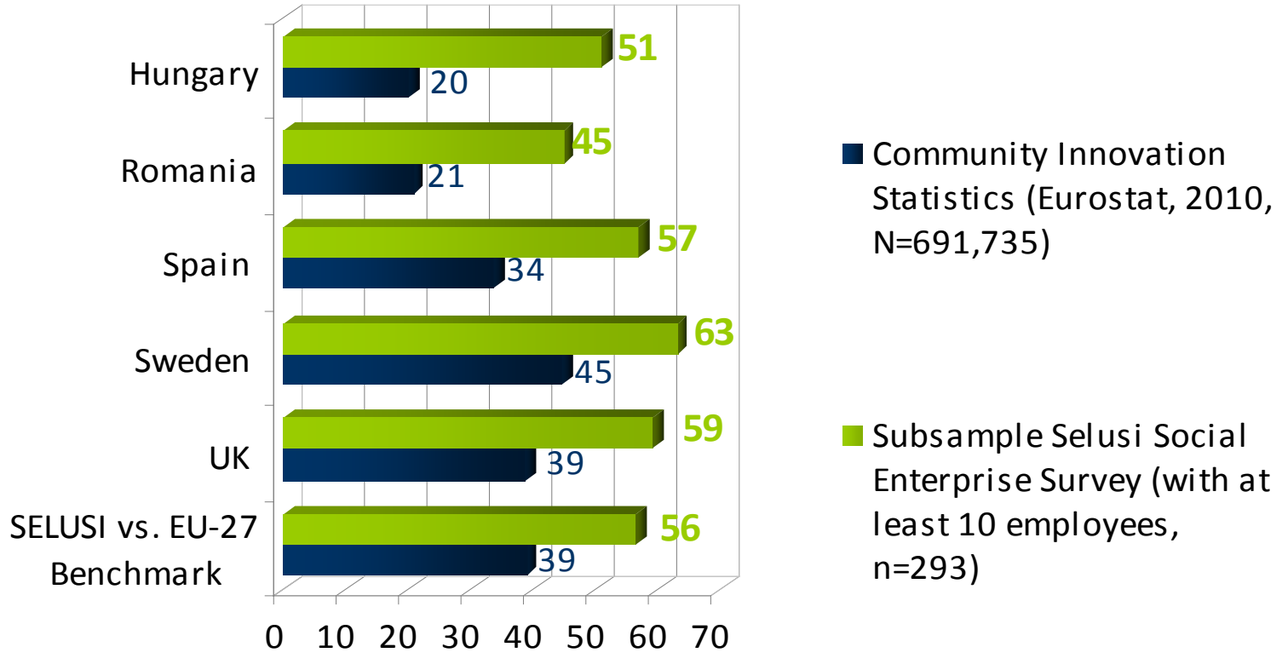


MUCH BEFORE THE BULK OF THE MARKETPLACE DOES

SELUSI

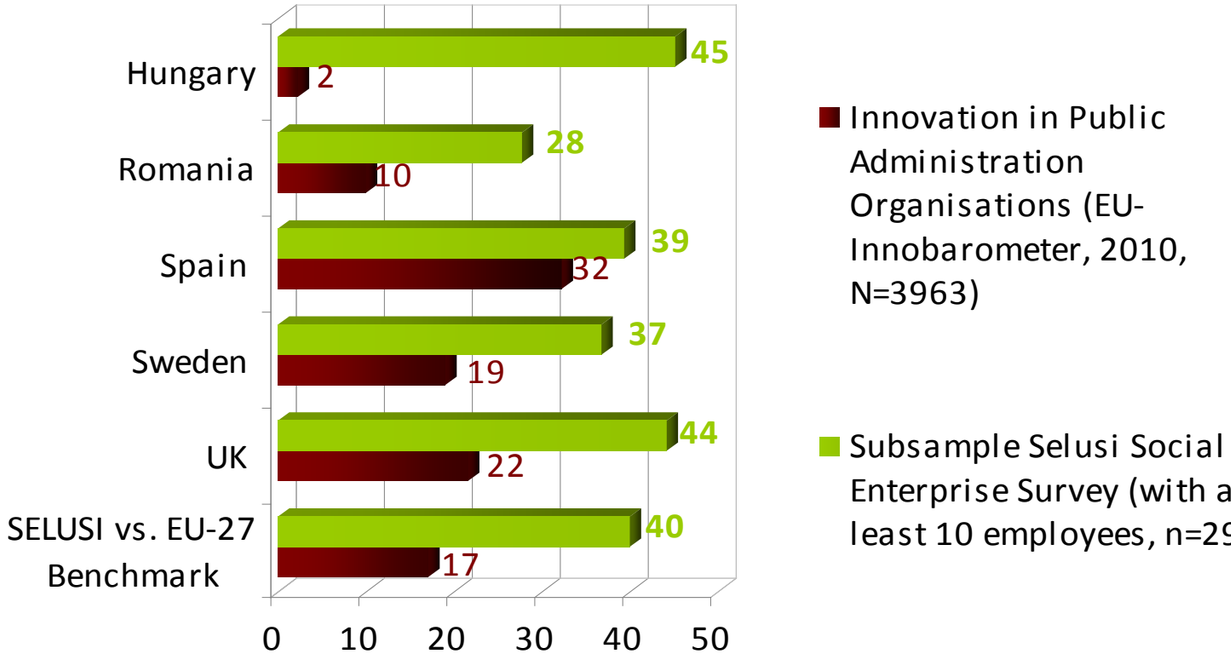
Linking social enterprises with innovation: More radical innovators than mainstream entrepreneurs

SOCIAL ENTERPRISES ARE MORE RADICAL INNOVATORS



THAN TRADITIONAL, COMMERCIAL ENTERPRISES

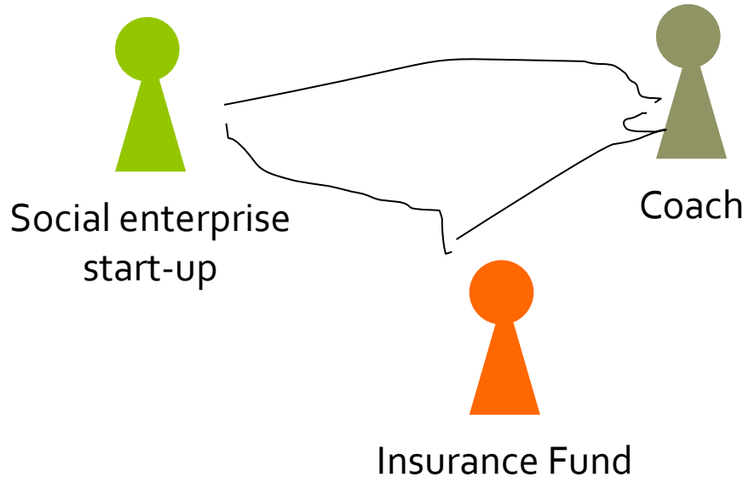
SOCIAL ENTERPRISES ARE MORE RADICAL SERVICE INNOVATORS



THAN PUBLIC ADMINISTRATION ORGANISATIONS

Another example of a new mechanism designed to overcome the frictions in the matching market for capacity support

2 Major underappreciated challenges that social enterprise start-ups face



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1. Access to high quality capacity support
2. Ability to pay for high quality capacity support (or ability to absorb this cost at full price upfront without certainty of positive results)

Process

1/ Identify gaps
2/ Design trajectory
3/ Find most suitable coach
4/ Enter coaching agreement
5/ Targets reached (yes/no) – follow-through on the agreement

EARLY FAILURE DETECTION | **RISK SHARING MODEL** | **INCLUSIVE** | **RESULTS ORIENTED EVERY PARTY IS INCENTIVIZED**

Concluding remarks

- **Social innovation and social entrepreneurship** open new application fields for mechanism designers.
- Given the sheer size of today's societal challenges, special (extra) interest in **growing the supply of prosocial behaviors**, matching this to these needs is warranted (to say the least).
- Some of the examples of **innovative mechanisms** designed to stimulate social innovation presented today provide inspiration.
- How can we leverage hese experiences to help **inspire systemic change**, transform markets at unusually large scale?