



# Micro Evaluation of R&D Funding Impact

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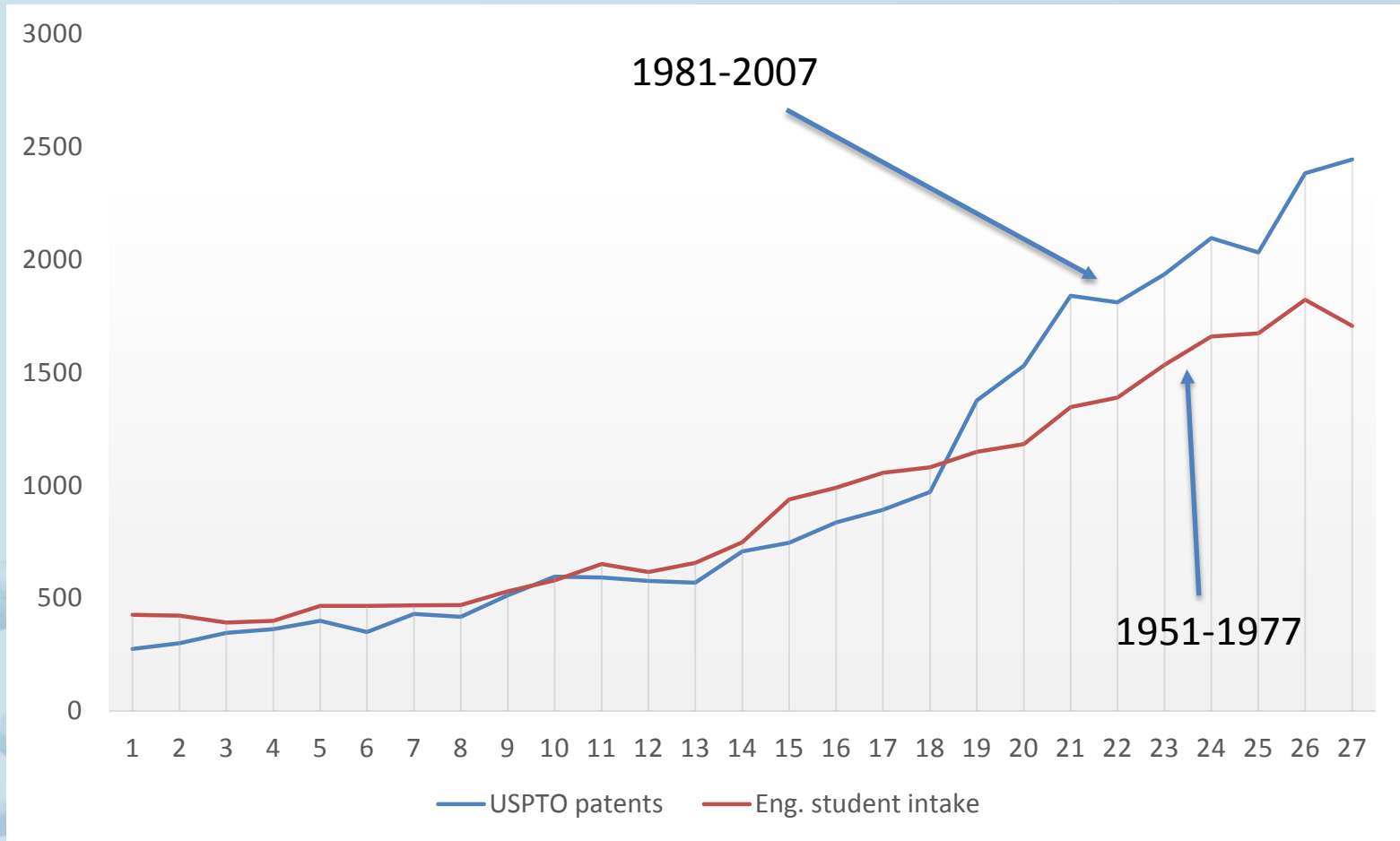
# This presentation

1. Some under-appreciated facts on the justifications for R&D support.
2. Additionality.
3. Some under-appreciated facts about public R&D support.
4. What is the room for national R&D policies, and what is their effectiveness?
5. A case for EU-wide innovation policy?
6. Conclusions.

# 1. On justifications

- Spillovers – but what...?
  - Knowledge spillovers to other firms / inventors.
  - Market stealing, duplication of R&D effort.
  - Consumer surplus.
- ... and to whom?
  - Ratio of EU-27/BEL patent citations = 1.55.
- Financial market imperfections.
  - Justify support in order to get a firm to start R&D.
  - Unless support lowers **marginal cost** of private funding, works against supporting firms who will invest in any case.
- Institutional structure.

# Education & invention (Finnish data)



Otto Toivanen and Lotta Väänänen, 2011, Education and invention, CEPR DP8537, Review of Economics and Statistics, forthcoming.

# 2. Additionality

- Additionality **not** a sufficient statistic for welfare improvement.
- Example: Green Mining Finland – R&D program.
  - Tekes 7M€.
  - Private sector 18M€.
- Main beneficiary: Talvivaara nickel mine (2008-).
  - Bankrupt.
  - Debt 1.4B€.
  - Environmental cleaning costs already > 150M€ & counting.

# 3. Some stylized facts

- Are support policies same across countries?
- Who gets R&D support?
- What does it mean to get public support?
- Are similar firms treated similarly in different countries?



# Countries are different

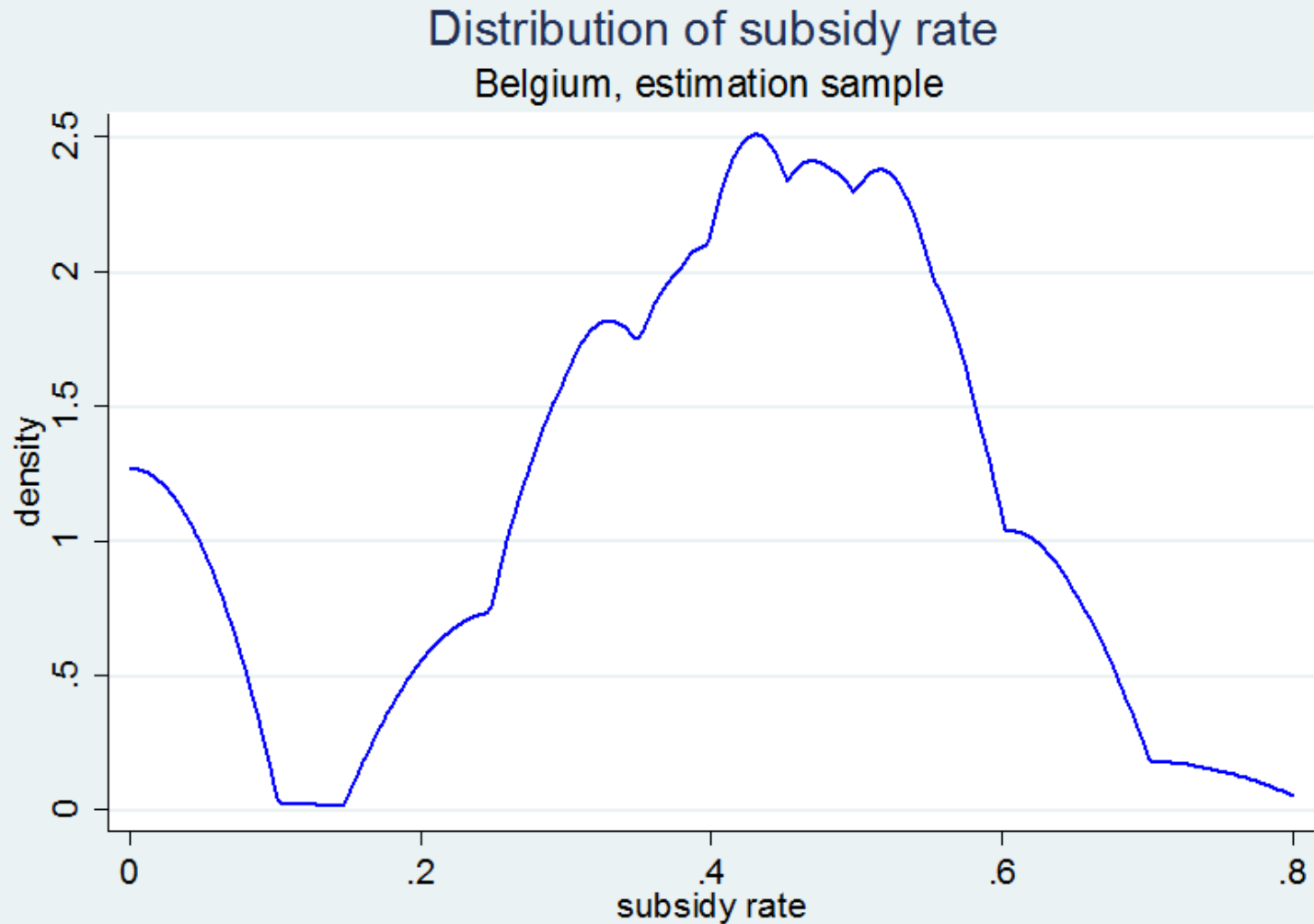
Table 2 Descriptive statistics

Descriptive statistics of the support policy

Variable	Belgium	Finland	Germany	The Netherlands	Spain
Subsidy rate	0.37	0.31	0.48	0.49	0.43
Accepted amount	701 000	365 000	651 000	872 000	1 022 000
Application prob.	0.07	0.20	0.02	0.04	0.03

NOTES: amounts are in thousands of year 2005 euro. We deflate by country-specific consumer price indices obtained from Eurostat.

# A subsidy may mean different things





# Comparing subsidy agencies

Table 7 Predicted subsidy rates

	mean
Belgium/Flanders	0.40
Belgium/Flanders   GER	0.99
Finland	0.36
Finland   GER	0.90
Spain	0.78
Spain   GER	0.97
The Netherlands	0.34
The Netherlands   GER	1.11

# 4. Room for national policies

- Build and estimate a model of the “R&D subsidy process”.
- Change the policies to study impact in different environments.



# R&D investment

## R&D investment compared to laissez-faire

	BEL	FIN	GER
First Best	4.5	2.8	3.0
Tax credit	1.9	1.2	1.8
Subsidy	2.2	1.4	1.4

# R&D participation

R&D participation rates			
	BEL	FIN	GER
Laissez-faire	0.40	0.57	0.40
First Best	0.43	0.59	0.43
Tax credit	0.41	0.58	0.41
Subsidy	0.40	0.57	0.40

# Welfare compared to laissez-faire

Welfare compared to laissez-faire			
	BEL	FIN	GER
First Best	1.03	1.02	1.04
Tax credit	1.01	1.00	1.01
Subsidy	1.01	1.00	1.00

# 5. Case for EU-policy

- Internalize the (knowledge etc.) spillovers to other EU countries.
- We use patent citations to measure knowledge spillovers.
- We keep the model otherwise intact.



# EU-level welfare from Belgian R&D

## EU welfare compared to laissez-faire

	EU
First Best	1.19
Tax credit	1.03
Subsidy	1.05
EU Subsidy	1.09

# 6. Conclusions

- “Spillovers” are a multitude - not just knowledge spillovers.
- Institutional background matters.
- R&D support not uniform at all:
  1. Small fraction of firms apply for subsidies.
  2. A lot of heterogeneity in subsidy rates.
  3. Government decision rules differ substantially.
- If national spillovers small, room for policy limited.
- EU-level policy may be more effective than national policies.