



Ministry of Economic Affairs

***“Heroic policy making:***

*To live in a modern democracy is to be experimented on by policymakers from cradle to grave. Education is intended to mould an upstanding future citizen; a prison sentence, reshape someone who has gone astray. But without evidence, those setting policy for schools and prisons are little better than a doctor relying on leeches and bloodletting. Citizens, as much as patients, deserve to know that treatments they endure do actually work”.*

*(“In praise of human guinea pigs”, *The Economist*, December 12<sup>th</sup>, 2015, p. 18)*

# Monitoring and impact assessment at Dutch Ministry of Economic Affairs

Dr. Theo Roelandt

Chief Analyst

DG Enterprise & Innovation

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State Aid evaluation: two years of implementation



## Outline

- ✓ Setting the scene and organisation for monitoring & evaluation practices (Politics, Cabinet, Ministry, DG Enterprise & Innovation) (**Why?**)
- ✓ Monitoring & evaluation strategy (**How?**)
- ✓ Concrete examples of monitoring and ex post evaluations (**What?**)
- ✓ Evaluation puzzles to solve and ex ante evaluation (**What else?**)



## Call for improving policy impact assessment

- ✓ Budget constraints call for more evidence on (innovation) policy impact ("value for money for the taxpayer") & a strong political pressure for greater cost effectiveness in public spending.
- ✓ Dissatisfaction with what we know so far on innovation policy impact (economists, policy analysts, Court of Audit, Parliament): installation of national expert group on Innovation Policy Evaluation (Theeuwes Committee, 2012): report "Dare to Measure".
- ✓ Treasury: Improving existing evaluation practice to ensure clear accountability and the most effective possible spending of public euros.



## The setting at Cabinet level

- ✓ Obligation to evaluate a subsidy scheme at least once every five years (General Administrative Law Act)
- ✓ Obligation to conduct a comprehensive policy review at least once every seven years (Regulation periodic evaluation research of Ministry of Finance)
- ✓ “Sunset Clause” for subsidy schemes: automatically stop after 5 years in operation (law of Ministry of Finance):
  - ✓ Maximum duration of scheme (normally 5 years), but extension possible
  - ✓ Evaluation is needed for evidence on impact motivating the extension in proposal to parliament
  - ✓ Regulation introduced in 2012, in force since 2014
  - ✓ Does not apply to funding of public organisations such as TNO



## Monitoring & evaluation strategy

- ✓ Developing a consistent Policy Intervention Theory.
- ✓ Monitoring key performance indicators (macro, policy areas, sectors, institutions & interventions).
- ✓ Sector intelligence (ministry, intelligence units commercial banks) & monitoring public-private initiatives.
- ✓ Evaluating policy instruments using state of the art methodologies and data following advice "Theeuwes" Committee (report "Dare to Measure"): ex post, ex ante and small scale policy experimentation.
- ✓ Investing in creating high quality (linked) micro-data sets (Statistics Netherlands & Implementation Agency)



## Ex post evaluations: guiding principles

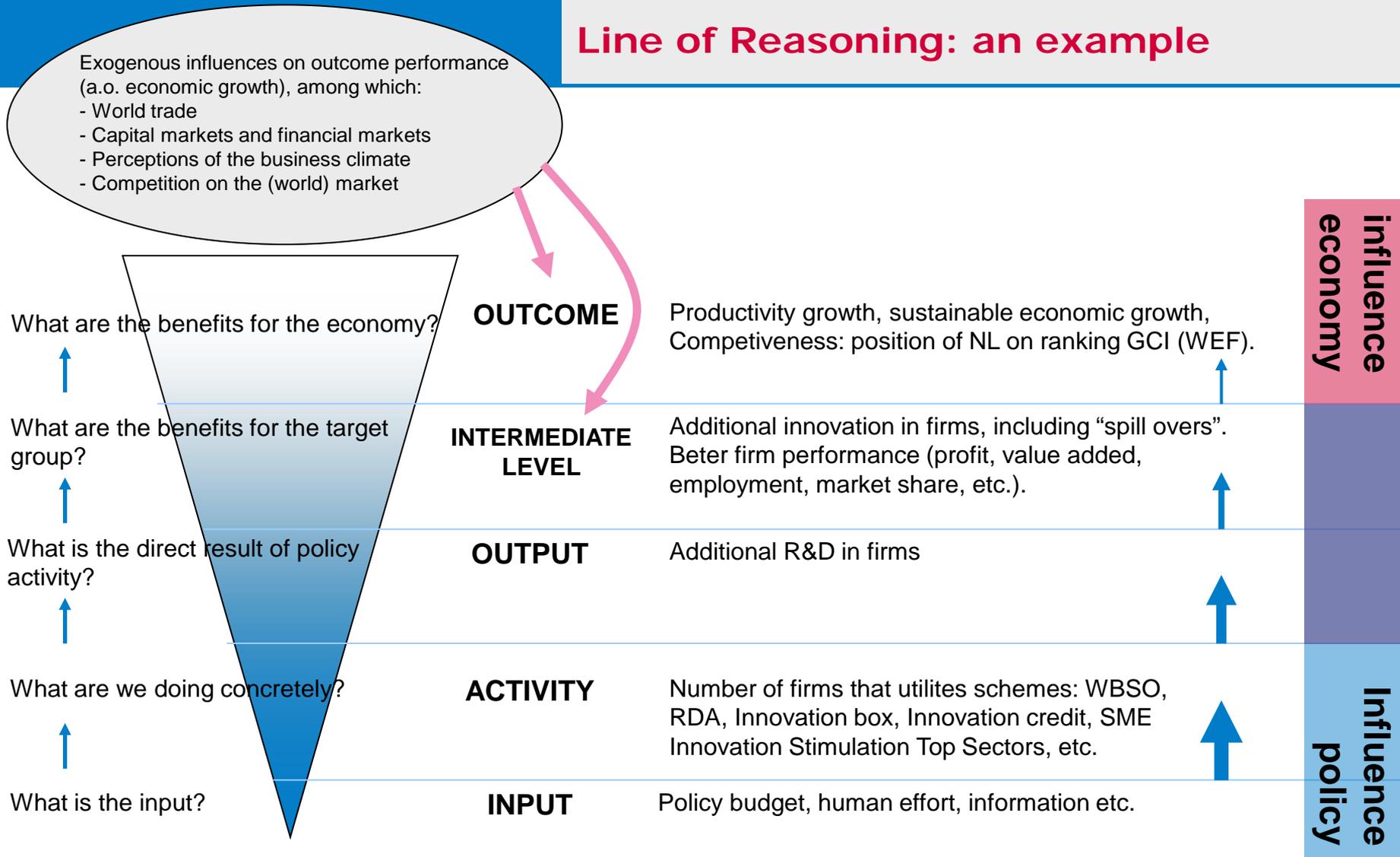
- ✓ Adopting **methodology** of Impact Evaluation Expert Working Group (Theeuwes Committee, report “Dare to measure”):
  - General principle: using econometrics and micro-data with experimental design, combined with supplementary surveys.
  - Following advice on evaluation designs for a number of specific policy instruments
  
- ✓ **Governance** of evaluation research:
  - Studies commissioned and funded by the ministry.
  - Independent research groups.
  - Guidance committee with an independent Chair and independent expert(s) involved.
  - Investing in good (linked) **micro-data**: the quality of an evaluation depends on the quality of the available (to be constructed) data (Statistics Netherlands & Policy Implementation Agency)!



## Line of reasoning for impact assessment

- Output versus outcome
- Impact of instruments primarily measured for output indicators (data and methodological limitations) using econometrics.
- Effects on outcome “estimated” by using empirical economic literature.
- Illustration & examples:

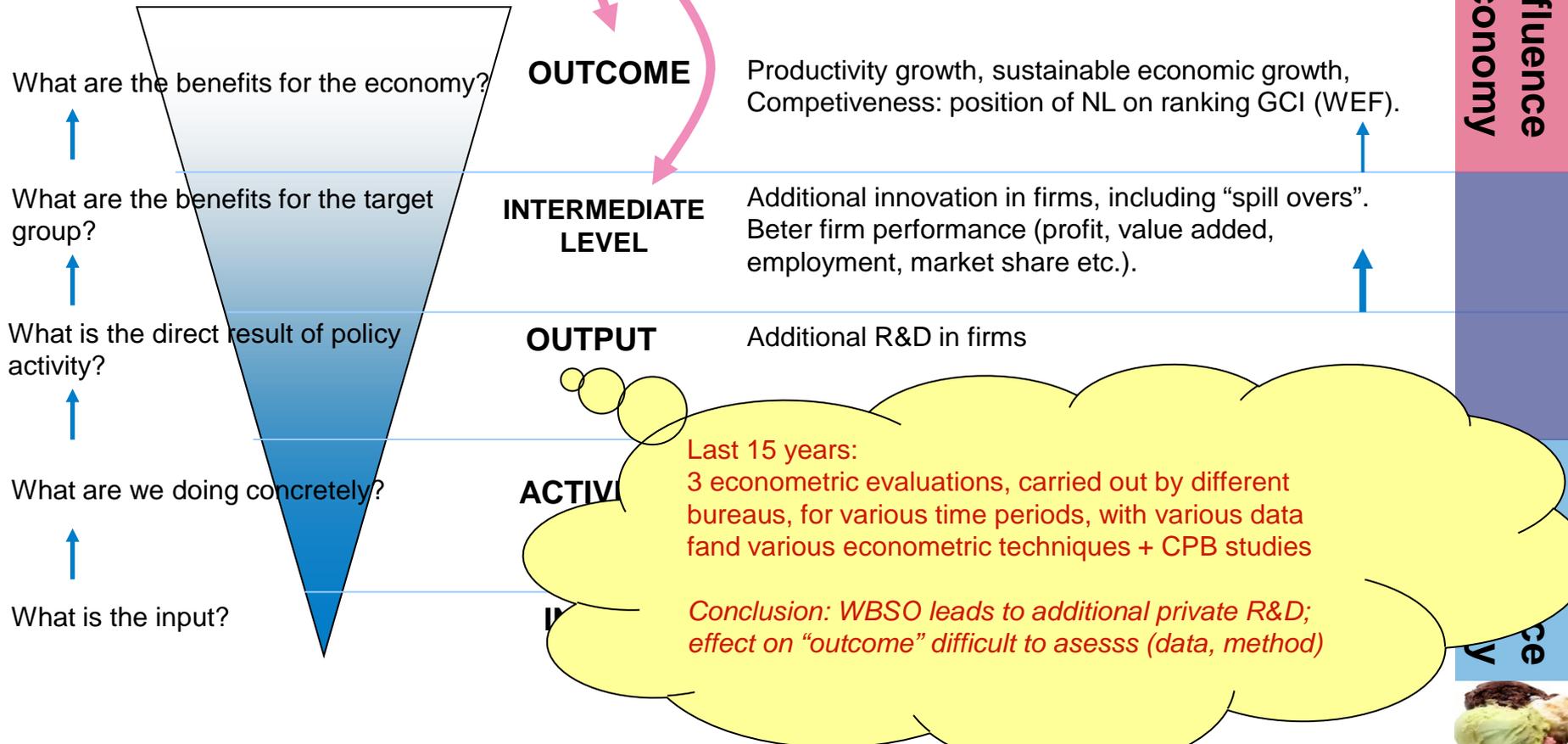
## Line of Reasoning: an example



## Example: what do we know about the WBSO?

Exogenous influences on outcome performance (a.o. economic growth), among which:

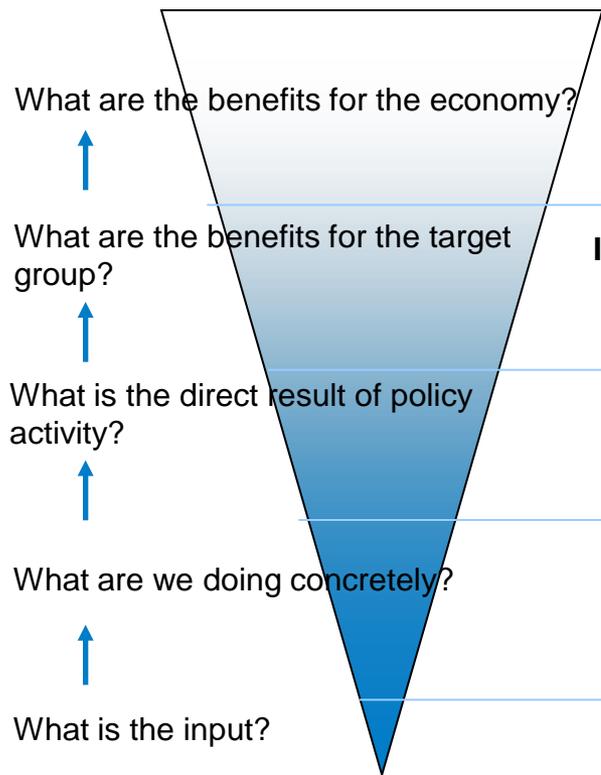
- World trade
- Capital markets and financial markets
- Perceptions of the business climate
- Competition on the (world) market



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**OUTCOME**



*State of the scientific and econometric literature on effects of R&D on GDP (Hall et al., 2009; Koopmans & Donselaar, 2015):*

*Social return to private R&D, measured as (marginal) contribution to GDP, is high and positive, but the exact size is uncertain (data, econometrics, time period, industries).*

**INTERMEDIATE LEVEL**

Additional R&D in firms

**OUTPUT**

Additional R&D in firms

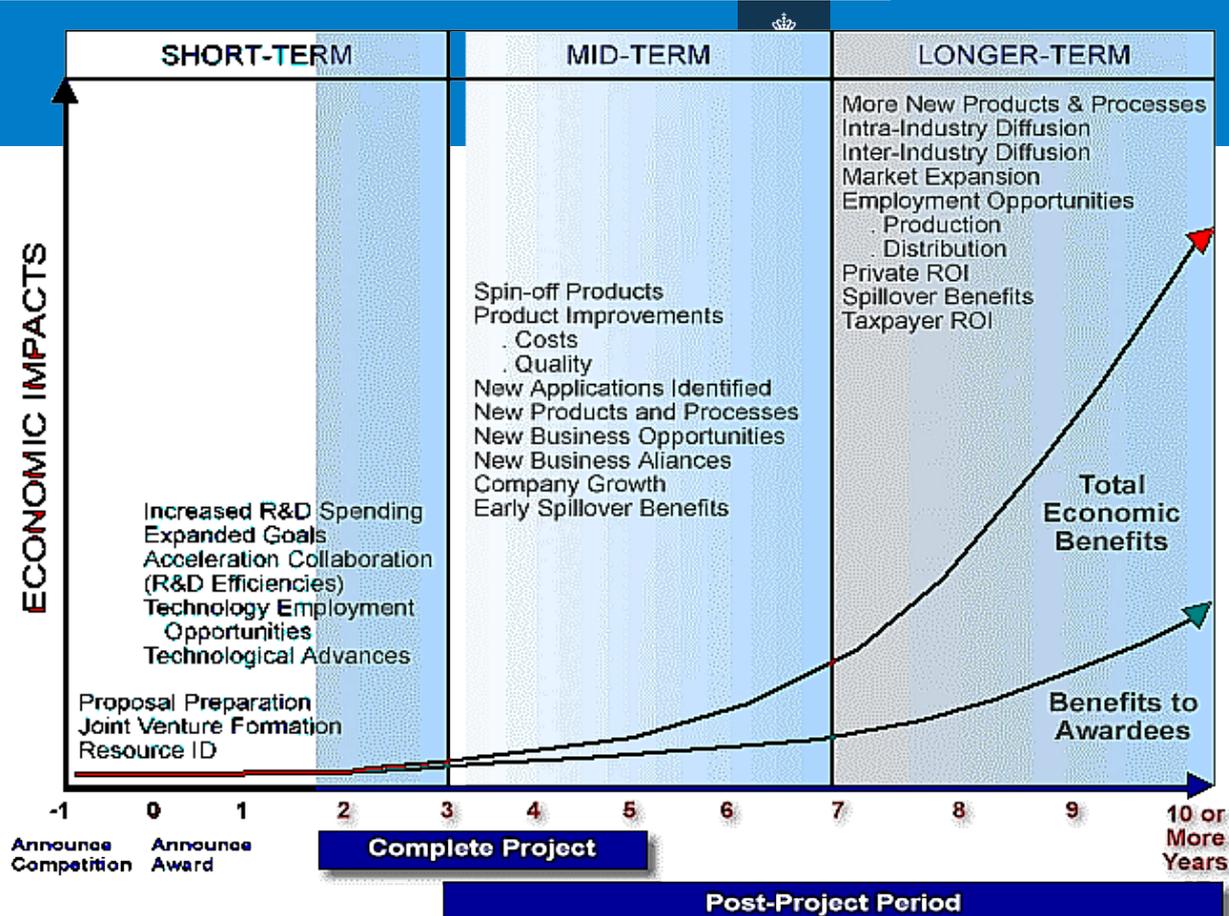
**ACTIVITY**

*Last 15 years:  
3 econometric evaluations, carried out by different bureaus, for various time periods, with various data files and various methods + CPB studies*

*Conclusion: WBSO leads to additional private R&D; effects on "outcome" impossible to assess (data, method)*



# The time factor in the social return to R&D .....



.... underlines the importance of good monitoring of:

- ✓ core indicators (incl. achieving goals);
- ✓ utilisation and output of instruments;
- ✓ developments in the position of (top) sectors;
- ✓ progress of activities, public as well as private;
- ✓ realisation of (interim) targets.



## *Example 1: evaluation of WBSO (I)*

- *Instrument:* tax credit for R&D labour costs, introduced in 1994
- *Goal:* increasing private R&D expenditure
- Evaluations conducted in 1995-1996, 1997-1998, 2001-2002, 2006-2007 and 2011-2012
- *Methodology adopted:*
  - Econometric analysis combined with survey techniques
  - Econometric analysis has evolved since pilot conducted by Statistics Netherlands in 1997-1998
  - Pre-Theeuwes (evaluation in 2011-2012 finished before activities of commission Theeuwes)
- *Data issues:*
  - Linked micro data from Statistics Netherlands & Implementation Agency
  - WBSO data at Statistics Netherlands as register for R&D wage costs
  - For other R&D expenditure data from Statistics Netherlands, but limited coverage



## Example 1: evaluation of WBSO (II)

- *Results:*
  - ‘Bang for the bucks’ consistently high:
    - respectively 1.02, 1.27 and 1.77 in evaluations since 2001-2002 for effect on R&D wage costs
    - for effect on non-wage R&D expenditure no clear picture, because of limited data availability
  - Positive impact on “turnover with new or improved products” and “productivity”
  - Spillover effects relatively difficult to quantify at the micro level
- *Policy impact:*
  - Support for continuing scheme.
  - Skipping WBSO for contract research in knowledge institutes, because this tax benefit was passed on to firms only to a limited extent
  - Decrease of relatively high tax credit rate for firms with relatively low R&D wage costs, because it was found that the ‘bang for the buck’ is negatively related to the tax credit rate.



## Example 2: Evaluation of Innovation Credit (I)

- *Instrument*: loans for development of new products with high risk, primarily aimed at SMEs; introduced in 2008
- Goal: increasing private expenditure on high risk development projects in SMEs
- Evaluation conducted in 2012-2013
- Methodology adopted:
  - econometric analysis combined with survey
  - first evaluation in which the Theeuwes recommendations were applied
  - ‘Difference-in-difference’ estimates chosen as preferred method
  - ‘Propensity score matching’ investigated, but not not feasible here (because of a very small “grey area” in which the rejected group is close to the awarded group)
- Data issues:
  - Linked micro data from Statistics Netherlands & Implementation Agency
  - WBSO data at Statistics Netherlands as register for R&D wage costs



## Example 2: Evaluation of Innovation Credit (II)

- *Results:*
  - A granted Innovation Credit leads to 68% more R&D wage expenditure at the firm level
  - € 1 Innovation credit leads on average delivers € 1.22 additional R&D wage expenditure
  - Assuming that total R&D expenditure is 1.5 times the R&D wage costs (based on data from Statistics Netherlands), it follows that € 1 Innovation credit leads on average to € 1.82 additional total R&D expenditure
  - No effects on innovation and productivity estimated; too early, because the scheme was introduced in 2008
- *Policy impact:*
  - Continuation of the Innovation Credit scheme
  - As part of a stimulation package for the risk capital market a temporary increase of the credit rate for small firms and SMEs cooperating with other firms or knowledge institutes



## Example 3: Evaluation of Innovation Scheme Shipbuilding (SIS)

- *Instrument*: subsidy for innovation in shipbuilding, introduced in 2007
- *Goals*:
  - Stimulating innovation in shipbuilding
  - Creating international level playing field in shipbuilding
- Evaluation conducted in 2014
- Methodology adopted:
  - Welfare analysis looking at static and dynamic efficiency
  - Information used from project files and a survey among firms
- Data issues: lack of observations to construct a control and a treatment group
- Results:
  - Hardly any additionality
  - Limited spillovers and output effects
- Policy impact: subsidy stopped in 2014



## Example 4: Evaluation of Eureka/Eurostars (I)

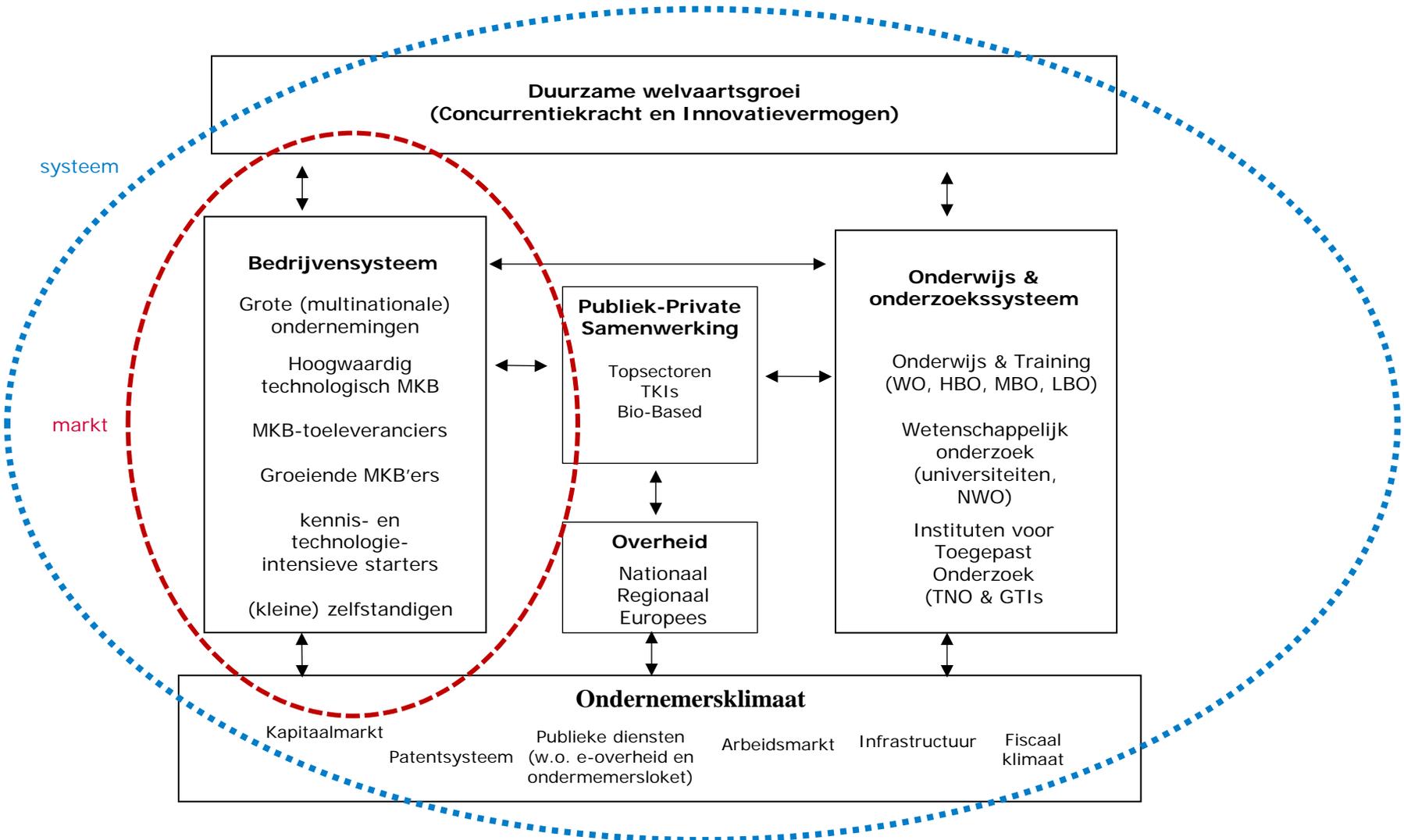
- *Instruments*: subsidies for international R&D cooperation projects
- *Goal*: stimulating R&D in international cooperation
- Evaluation conducted in 2013-2014
- *Methodology adopted*:
  - Survey combined with econometrics
  - Econometric technique: regression discontinuity approach
- Data issues:
  - Linked micro data from Statistics Netherlands & Implementation Agency
  - WBSO data at Statistic Netherlands as register for R&D wage costs
  - Limited number of observations for quantifying the effects on R&D expenditure
  - Not enough data at Statistics Netherlands for investigating further effects on innovation, international cooperation and productivity



## Example 4: Evaluation Eureka/Eurostars (II)

- *Results:*
  - No clear quantitative evidence of impact subsidy on R&D:
    - results varying (ambiguous) and often not significant
    - no strong conclusions to be drawn because of data limitations and unsolved methodological puzzles
  - Positive survey results, particularly stated positive impact on international technological cooperation and strategic positioning in European partnerships
- *Policy impact:* none (continuation of schemes)

# Example 5: Comprehensive Policy Mix Audit (2015)





## Evaluation puzzles to solve

- Ex post evaluation “single agent instruments”: “easy to do” using micro-data and econometrics
- How evaluating Public Private partnerships (multiple actors, multiple interventions, multiple goals)?
- How evaluating network approach in modern industrial policy?
- Limited coverage of firms in micro data from Statistics Netherlands originating from surveys (e.g. innovation survey)



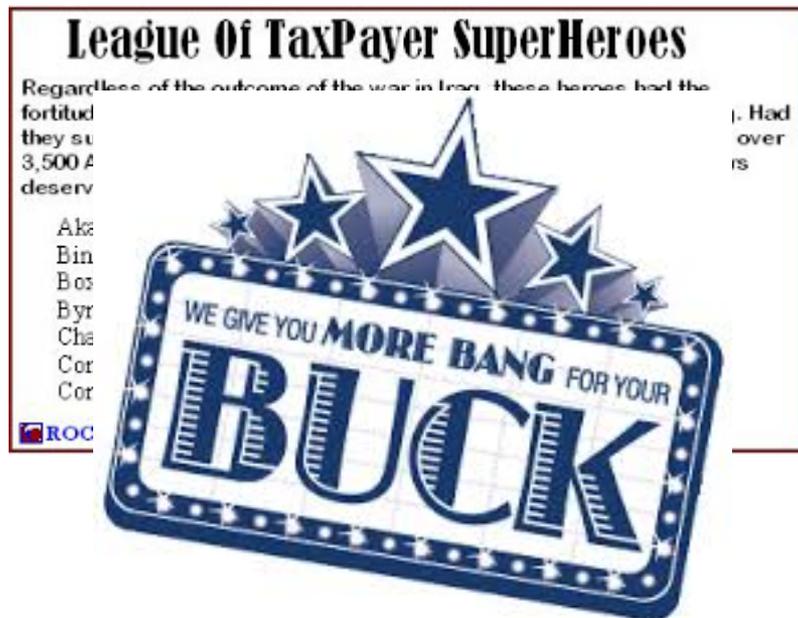
## Ex ante impact assessment

- Small scale policy experimentation
  - recently started up “real life” policy experiments in the field of “non-technological innovation”, “business model innovation” & “servitization in manufacturing industries
- Behavioural Insight Team at Ministry of Economic Affairs:
  - Food Waste, Energy Saving as first themes
  - Currently exploring options for projects in field of entrepreneurship & innovation
- Social Cost-Benefits Analysis: limitations in the field of innovation policy =>
  - Total costs are known, impact is uncertain in advance
  - Social benefits mainly depends on spillovers, which are difficult to estimate, even in ex post evaluation research



## Thanks, Questions and discussion

Dare to measure and... become heroic policy makers!



Most information also available in English (summary):  
please contact dr. Henry van der Wiel at [H.P.vanderWiel@minez.nl](mailto:H.P.vanderWiel@minez.nl)