
Costs and benefits of regulating and restricting chemicals: The European Union's REACH system and its impacts on the Austrian economy

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The REACH system

- REACH = European Legislation (in force since 2007/2008) on the **R**egistration, **E**valuation, **A**uthorization and **R**estriction of **C**hemicals
 - Substitutes all national regulations of chemicals in the EU member states → standardization of regulations contributing to the Common Market of the European Union
 - “Burden of proof” lies on producers, manufacturers and industrial users of chemicals
 - Instead of authorities having to prove that chemicals are dangerous, companies have to prove that their chemicals are not dangerous to human health and the environment
 - Costs of studies, processes/procedures (data sheets, information packages)
 - ECHA European Chemicals Agency (Helsinki)
 - Austria: 2005: “Ex ante” BCA on costs & benefits of REACH in Austria
 - 2014/2015: “Ex post” BCA
 - Several studies including stakeholder perspectives, production (value added), employment, prices [commissioned by the Austrian Ministry for the Environment)



Overview

- Benefit-cost analysis of the REACH system in Austria
 - Basic assumptions & frameworks
- REACH benefits
 - Human health
 - Environment
 - Business (innovation, qualification)
- REACH cost estimates
- Results
- Discussion, conclusions, perspectives

REACH Benefit-Cost-Analysis: basic assumptions

■ Basic framework

- Time frame
 - 2008: implementation of REACH in EU (& Austria)
 - Evaluation period: 2014-2044
- Baseline: „Do-nothing-case“ (taking into account the growth of population)
 - i.e. national regulations of chemicals would be in place
- Several scenarios for human health / environmental effects / costs of companies: range of benefits & costs

■ Benefit-cost analysis

- Efficiency vs. distribution of benefits & costs vs. burden of individual companies (e.g., SMEs)

What would happen if REACH would not exist?

- Development of a baseline scenario: REACH...
 - ... provides information on hazardous chemicals for companies and authorities
 - ... certifies ingredients of chemicals; ... tests & evaluates
 - Broader information basis, fewer hazardous chemicals
 - Improvements for human health (workplace, households, general public health) & the environment

REACH benefits: human health & the environment

- Health benefits: reduction of ...
 - ... Skin diseases (dermatitis)
 - ... Respiratory diseases (e.g. asthma, lung diseases)
 - ... Cancer
 - ... Multiple Chemical Sensitivity (MCS)
 - ... Poisoning and burns
 - ≈ 5% of public health problems are directly related to chemicals → 5% of these cases are reduced owing to REACH
- Environmental benefits: reduction of ...
 - ... Hazardous waste
 - ... Contamination of the soil and ground water

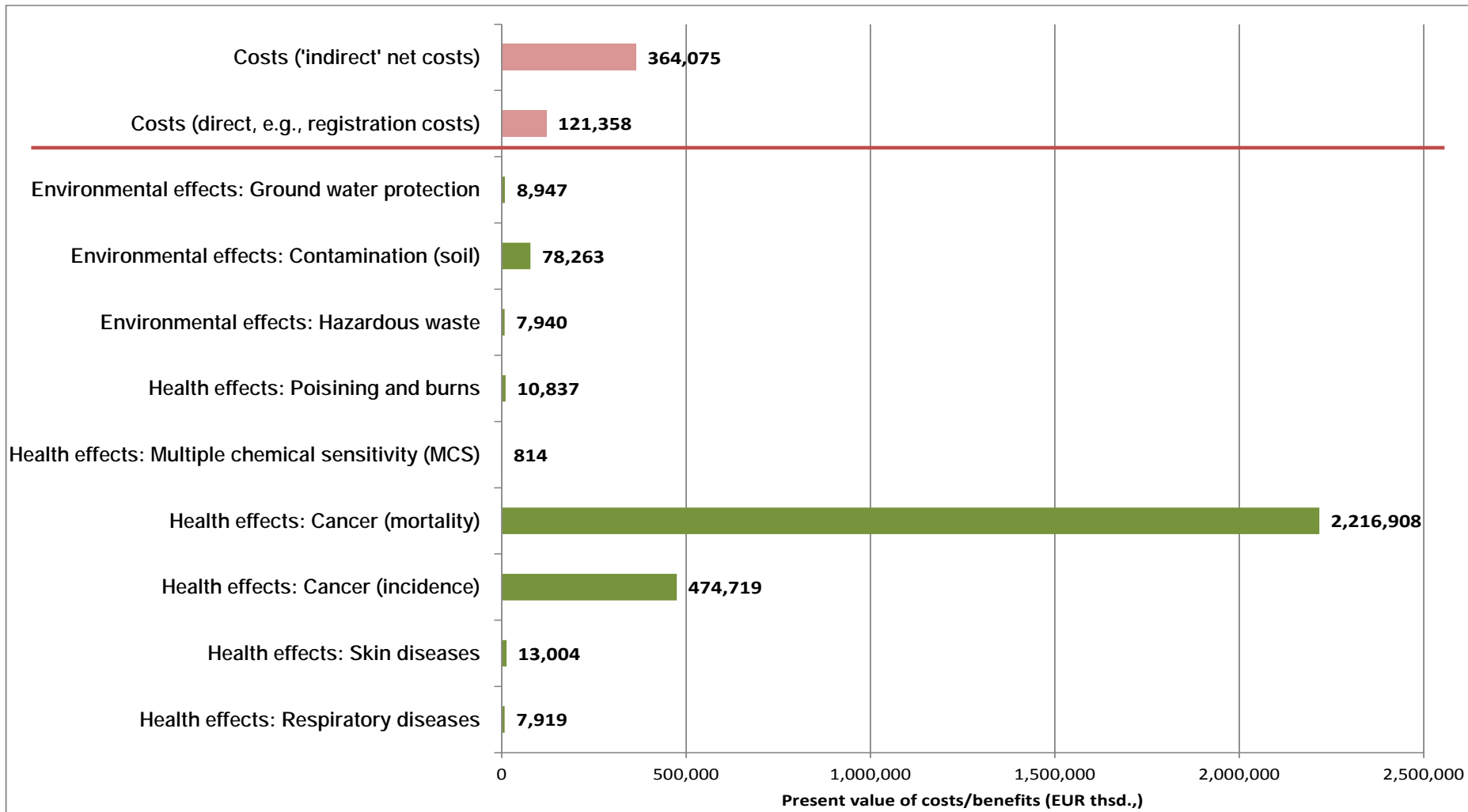
REACH costs: direct and ,indirect' costs

- Direct costs
 - Chemicals assessment, registration, submission of documents (2008-2014, ECHA)
- ,Indirect' (net) costs – concept:
 - Potential costs of companies (e.g. investment in new technologies & changes of production processes)
 - Reduced availability of materials (chemicals)
 - Potential benefits of companies
 - Innovation
 - Quality and environmental management
 - Increased productivity
- ,Indirect' (net) costs = costs of changes of processes and products net of benefits of innovation, productivity, quality improvements

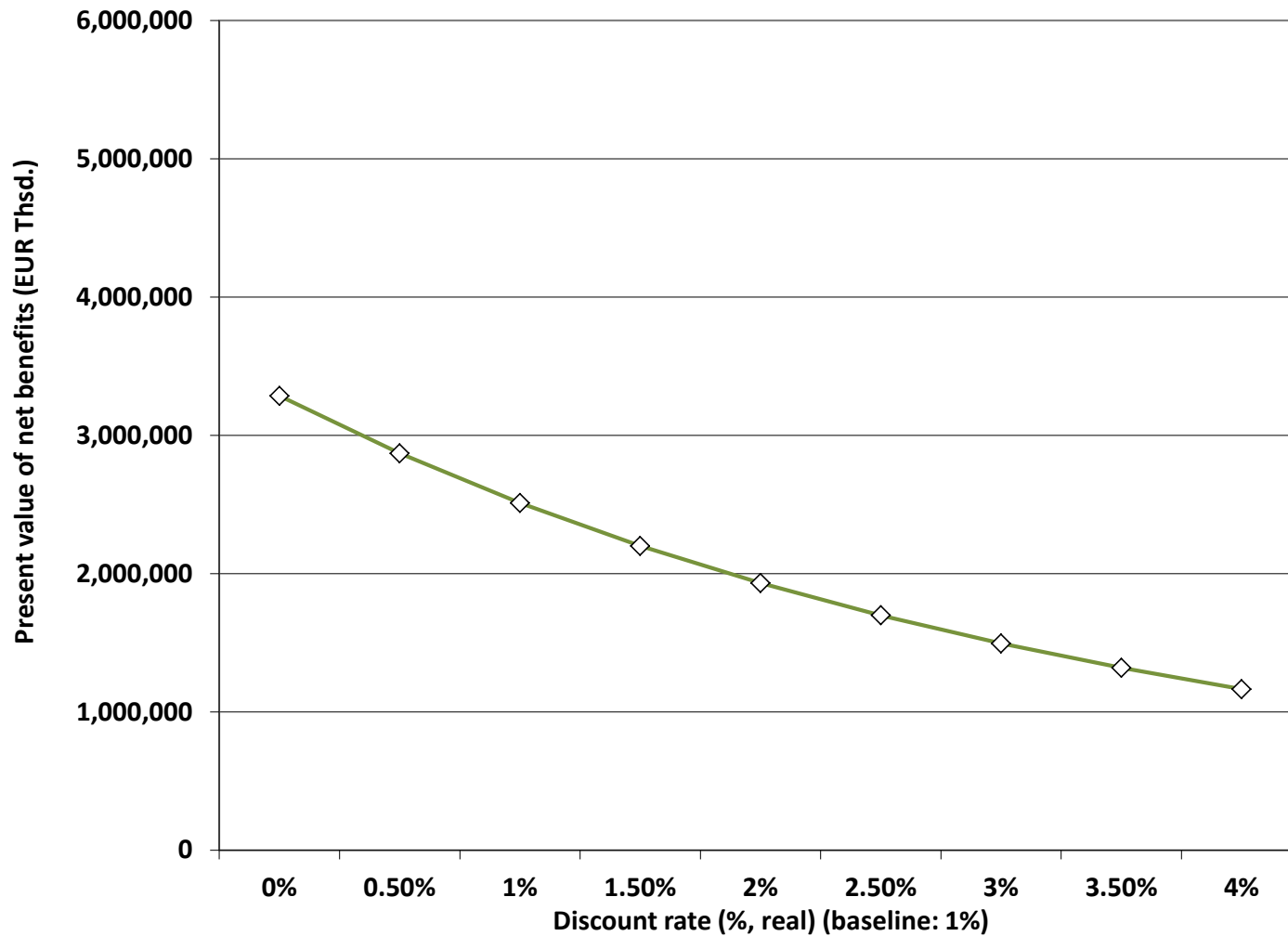
Overview of key results of the benefit-cost analysis (2008-2044, baseline scenario)

Present value of net benefits	2,511,193	EUR Thsd.
Internal rate of return	35.14%	%
Annuity	97,304	EUR Thsd.
Benefit-cost ratio	9.15	
Present value of total benefits	2,819,351	EUR Thsd.
Present value of total costs	308,158	EUR Thsd.

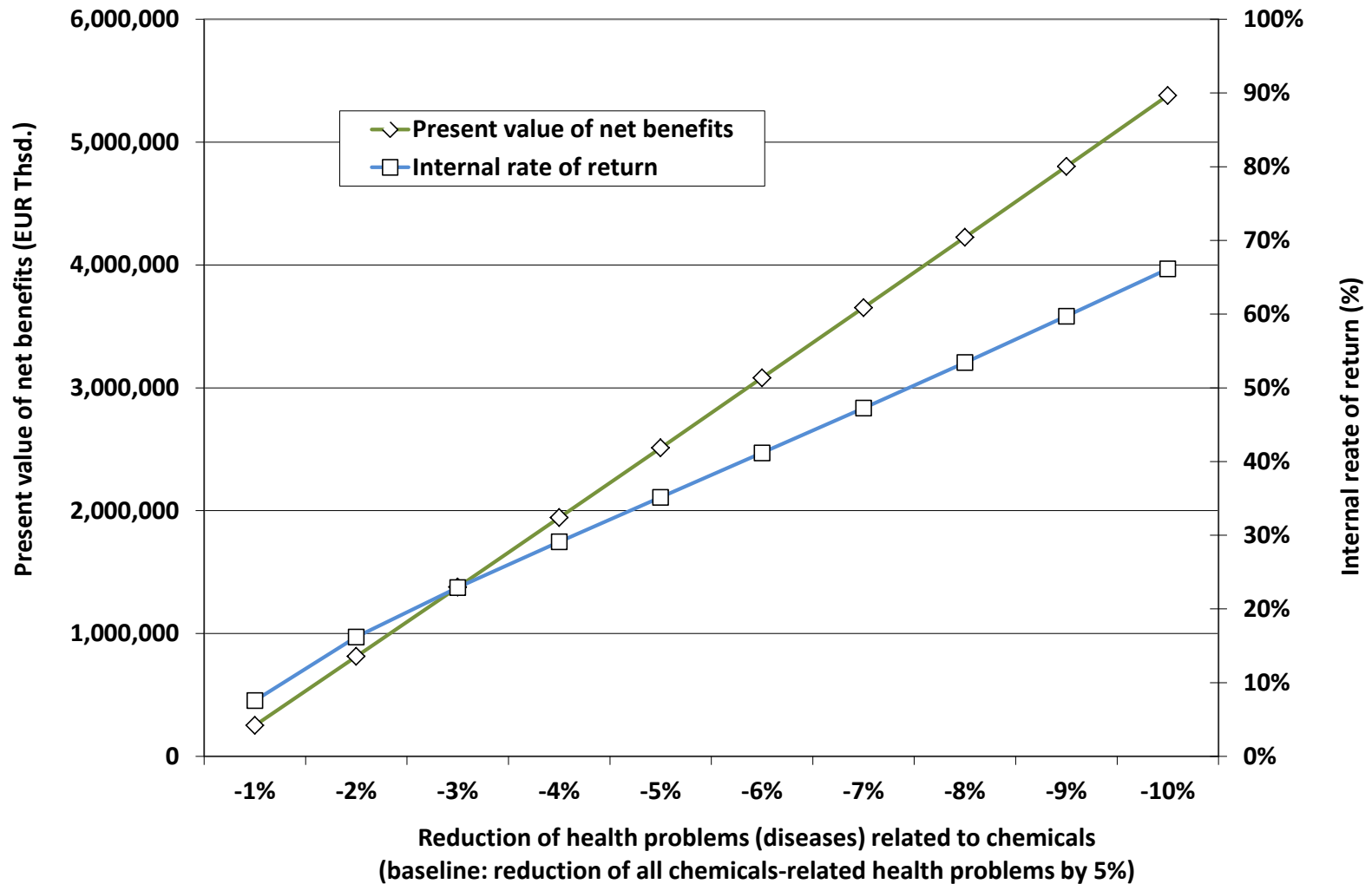
Present value of costs and benefits (all categories, baseline scenario)



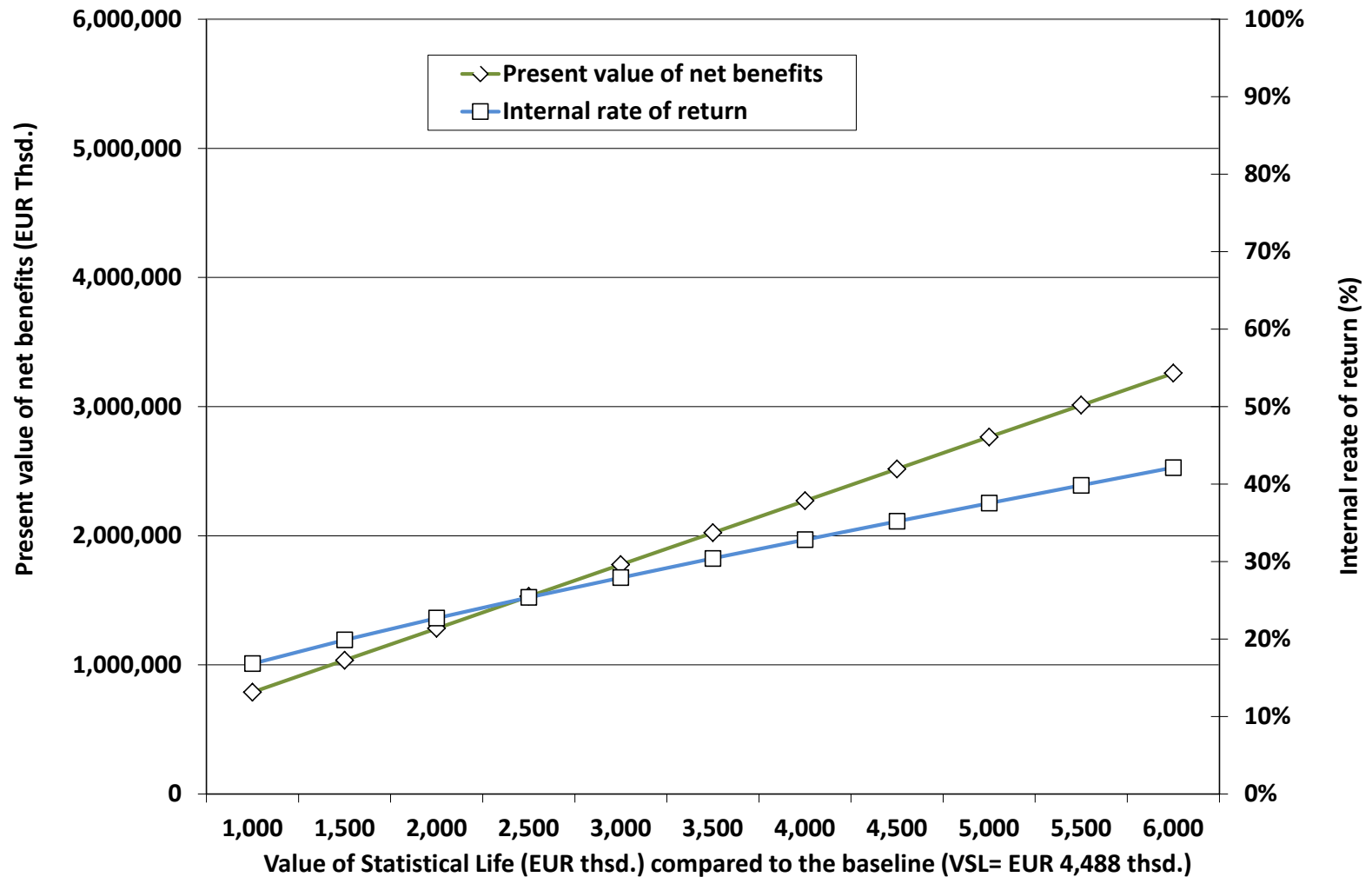
Sensitivity analysis: discount rate



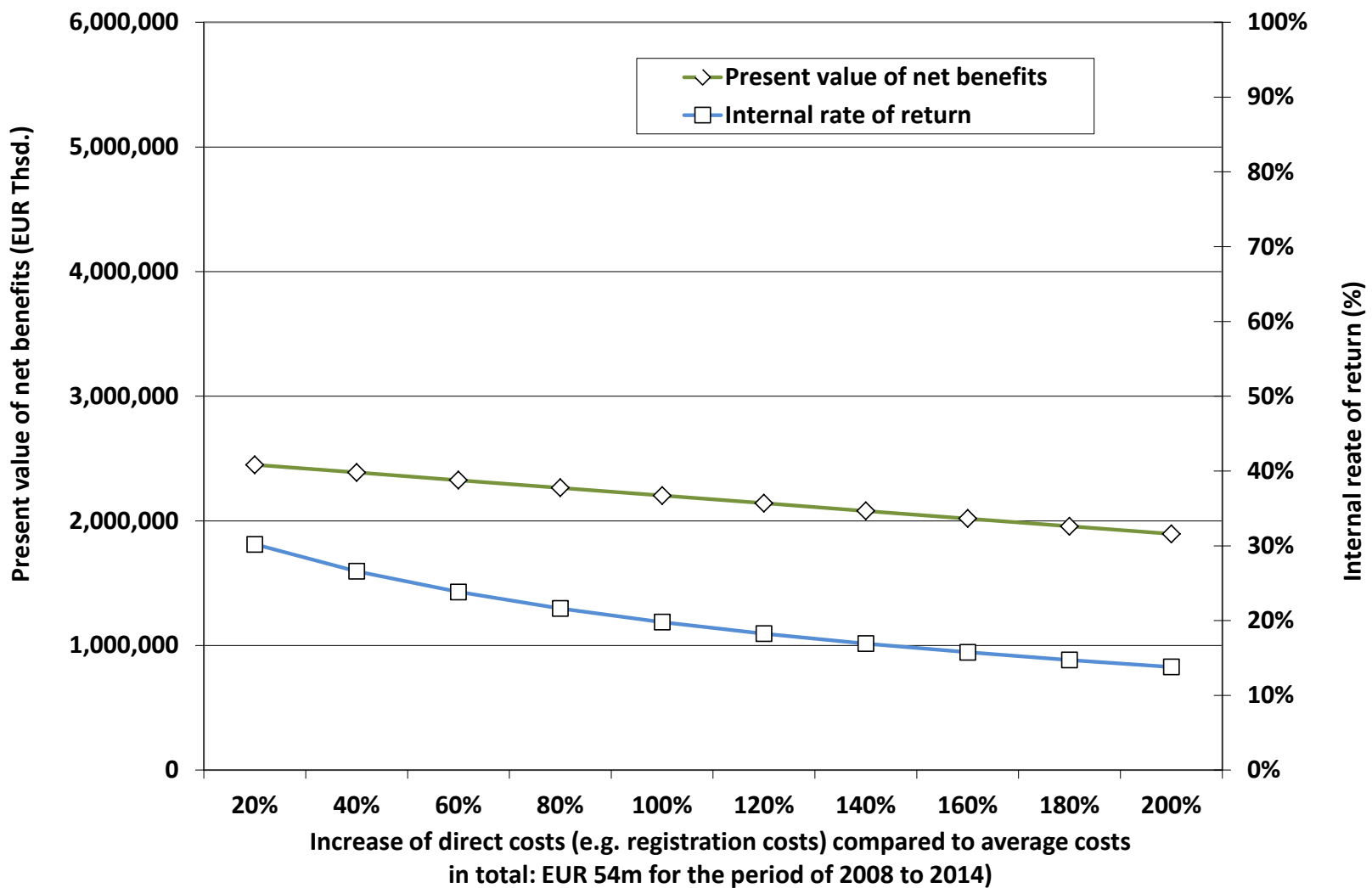
Sensitivity analysis: health benefits of REACH



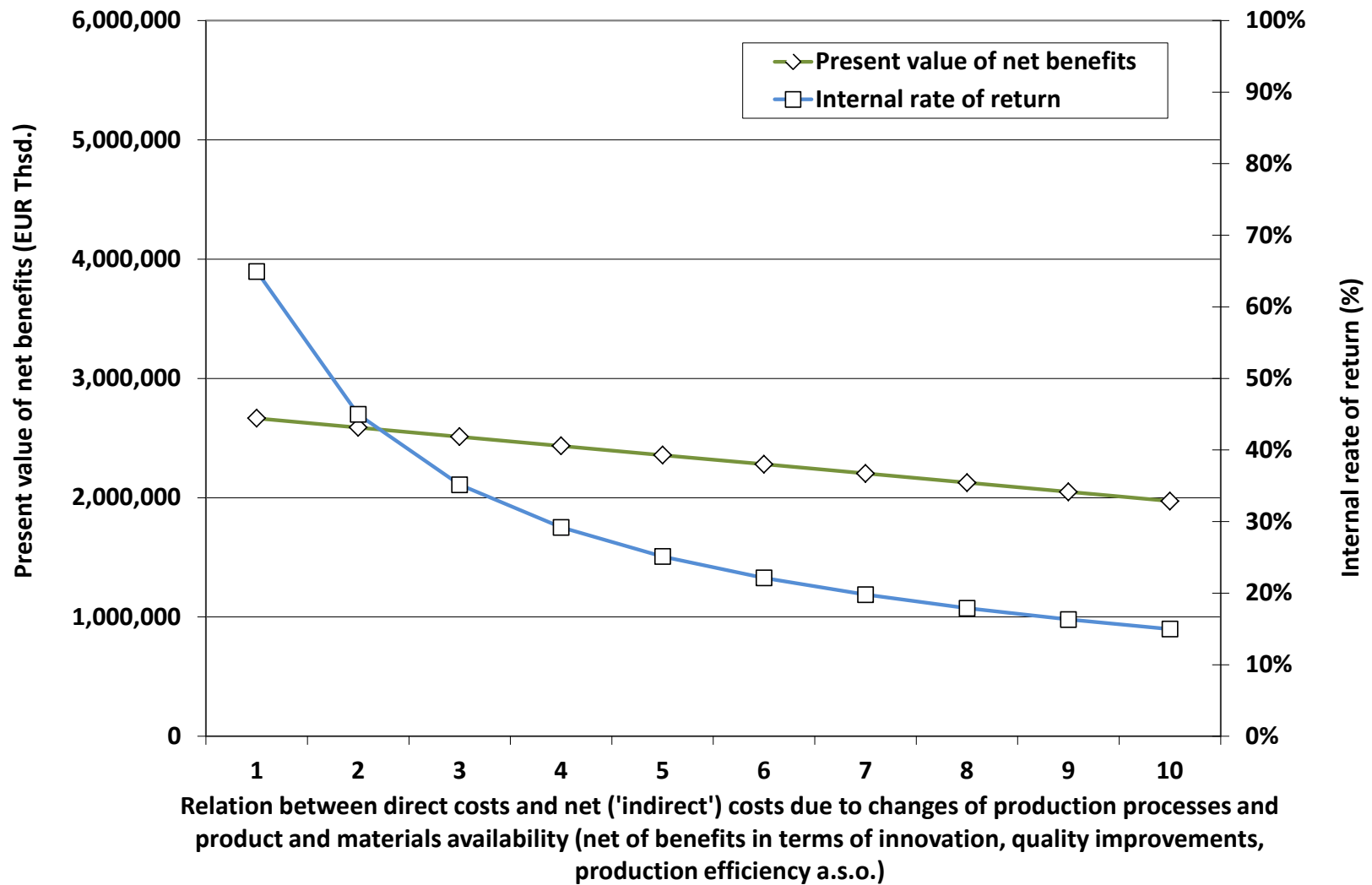
Sensitivity analysis: Value of Statistical Life (VSL)



Sensitivity analysis: Increases of direct costs



Sensitivity analysis: Relation of 'indirect' (net) costs to direct costs



Results & discussion

- Fundamental uncertainties ...
 - Estimation & scenarios of health benefits
 - Valuation of health benefits
 - Development of cost estimates over time (→ beyond 2018)
- ... however:

It is very likely that total benefits of the REACH regulations (especially health and environmental benefits) in Austria are larger than total costs (e.g., registration costs); this means that the REACH regulation is „efficient“ from an economic viewpoint

 - Main driver: health effects in terms of reduced cancer morbidity
 - 5% reduction of chemicals-related cancer morbidity in 2044 corresponds to 43 cases of cancer avoided
 - CBA 2005: 44 cases avoided (2038)
 - 2013: ≈770 cases of cancer related to chemicals (=4% of all cases of cancer morbidity in Austria [in total about 20,000 cases])

Conclusions and perspectives

■ (Research) Problems & perspectives

- Quantification of health effects problematic (even ex-post)
 - REACH benefits may be there, but cannot easily be detected even if complete information would be available („noise“ in statistical procedures)
- Costs may be distributed unevenly
 - SMEs may face more severe problems than the large companies
 - Chemicals industry is managing REACH quite well
 - Worries & potential economic problems in down-stream branches

■ Information about REACH

- Opinions & guesstimates & expectations in surveys and workshops
 - Positive health benefits of REACH expected by all
 - Better coordination / cooperation
 - between chemicals industry & downstream branches
 - between different provincial/federal authorities

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THANKS!

