

## Public Presentation of Doctoral Thesis:

### “Consideration of uncertain future demand and decision flexibility in the determination of intervention programs for buildings”

Tuesday, November 14, 2017, HIL E6

#### Time and place:

Tuesday, November 14, 2017  
 Presentation from 17:00-18:00  
 Apéro starting at 18:00

Building HIL, Auditorium E 6  
 ETH Zurich, Hönggerberg, 8093 Zurich

#### Presenter:

Miriam ESDERS  
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#### Summary:

Buildings cease to function due to (1) the change of the ability of the building to meet fixed requirements, (deterioration) and (2) the change of requirements for the building. Building managers want to determine what to do with their buildings at present to maximize their net-benefit in the long term by determining the interventions today and possible interventions the future in an intervention program. Uncertain changes in demand make it undesirable to evaluate intervention programs now and then follow them over the remaining planning horizon. Instead, flexible solutions can be determined, which consider the possibility to postpone decisions on the actual intervention program at later moment when more information will be available, i.e. consider the possible decision flexibility of the building manager.

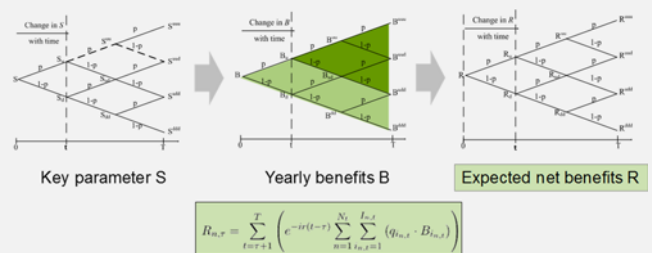
The main objective of this research is to investigate how to consider this decision flexibility in the determination of intervention programs with consideration of the uncertainty in future demand and to define a method that can support a decision maker in the determination of such intervention programs.

In this thesis, a Real Option Method for the evaluation of intervention programs with

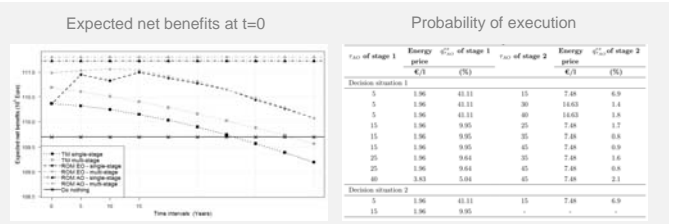
consideration of decision flexibility is presented and applied to a simple example of a fictive office building and a real world example of a clinic of a Swiss university hospital, together with a methodology to identify eligible intervention projects where the consideration of decision flexibility is relevant.



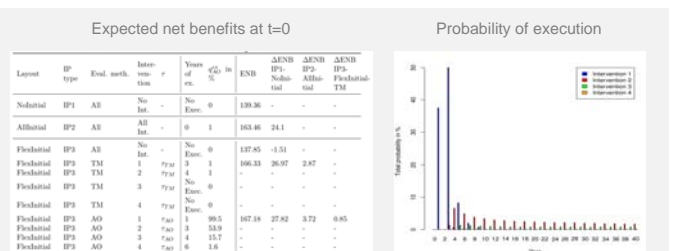
Steps of Real Option Method



Dynamic model of expected net benefits in lattice



Intervention programs from the simple example



Intervention programs from the real world example