

# Incentivizing flexibility in regulated industries

Frank Fichert, Worms University of Applied Sciences  
CCAM – Competence Centre Aviation Management

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# Flexibility

- (One) **definition of flexibility:**  
Ability of a system (e.g., firm, economy, ...) to adapt to a changing environment
- (One) ANSP context:  
Adapting to – especially unpredicted – **changes in traffic/demand**  
(with different reasons, including lacking capacity elsewhere)
- However:  
Some changes can be (partially) influenced – e.g., using **demand management**

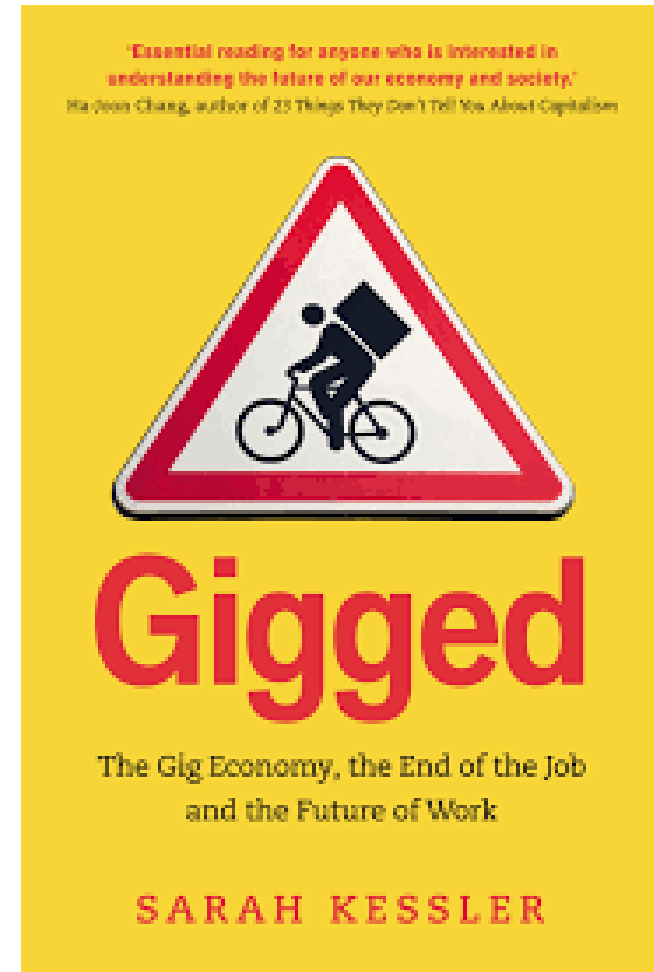
‘There is no such thing  
as a free lunch’

***Milton Friedman***



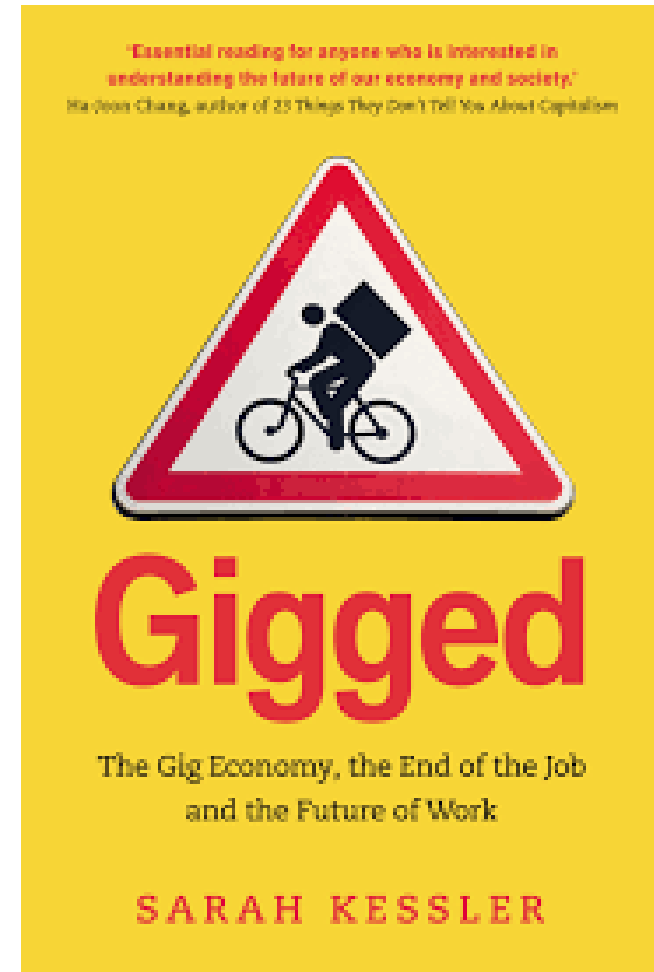
Picture: Wikipedia Commons

Is there such a thing  
as **free flexibility**?

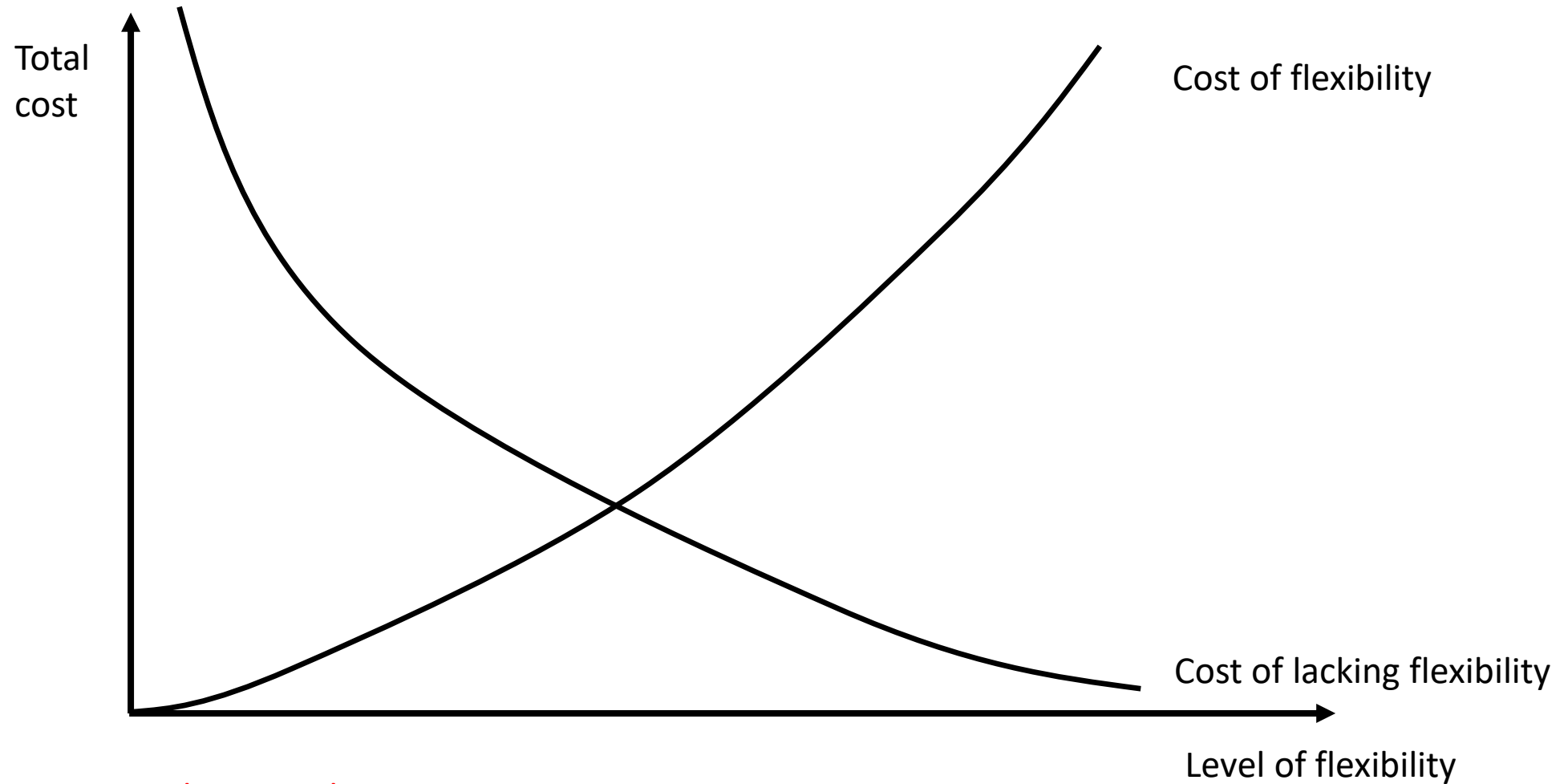


Is there such a thing  
as **free flexibility**?

Usually the answer would be  
**NO**

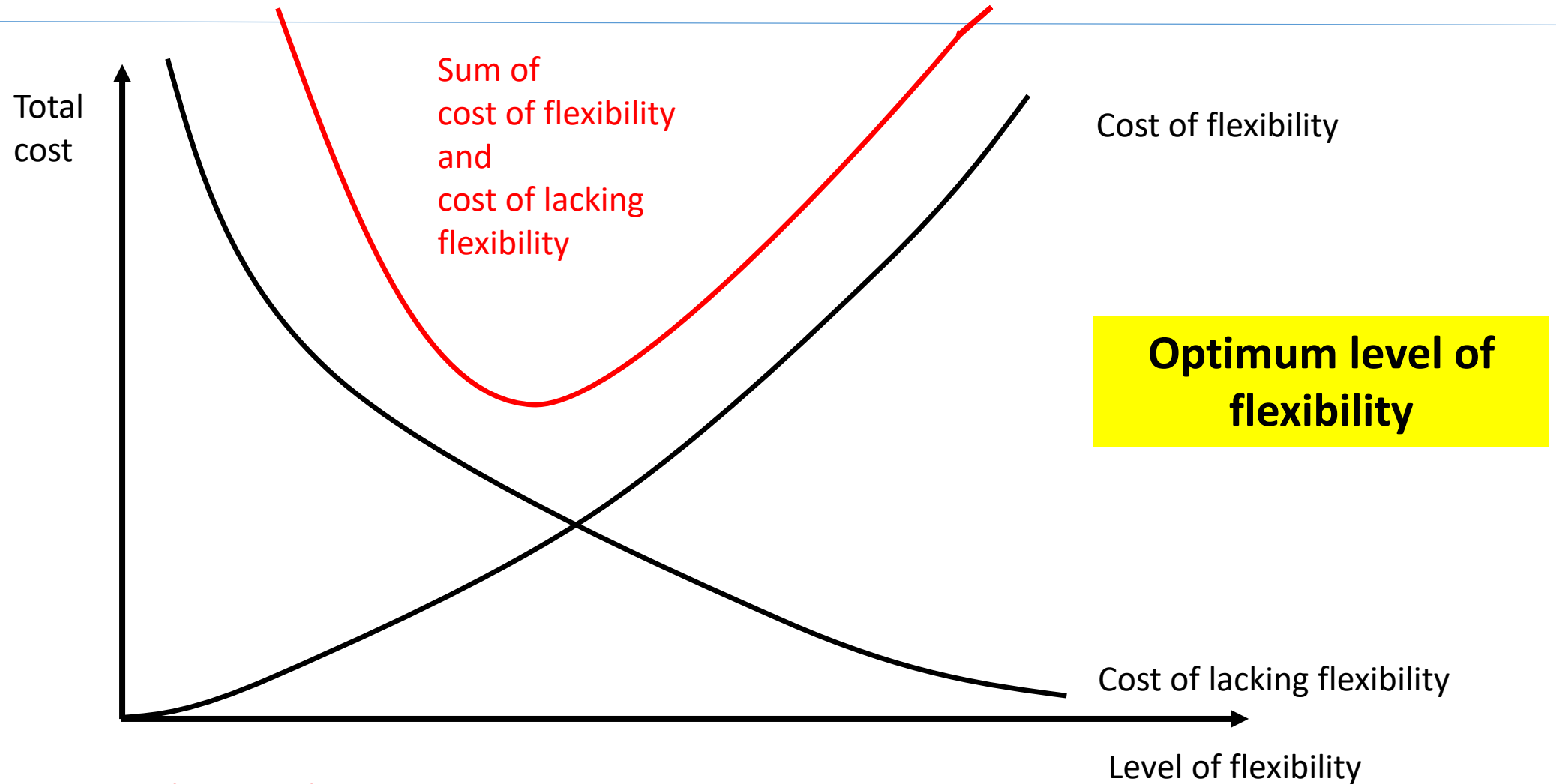


# Flexibility – Trade off



Schematic diagram

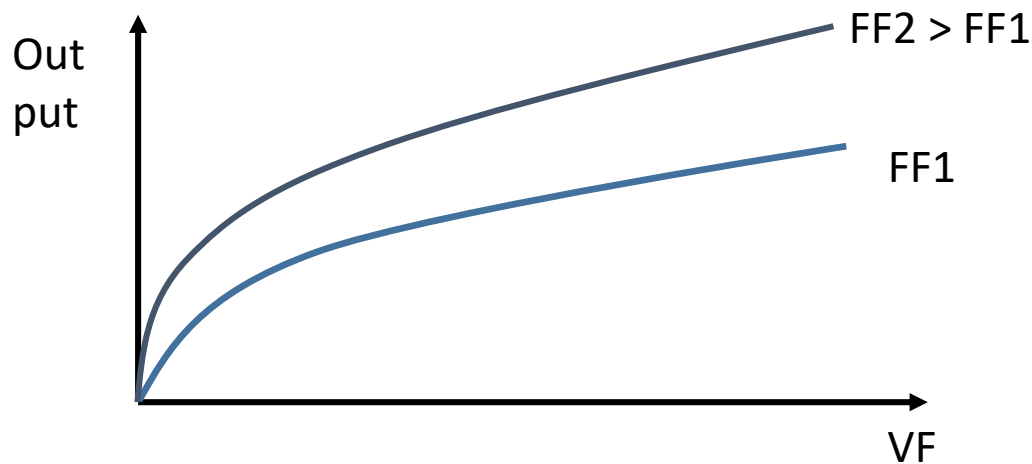
# Flexibility – Trade off



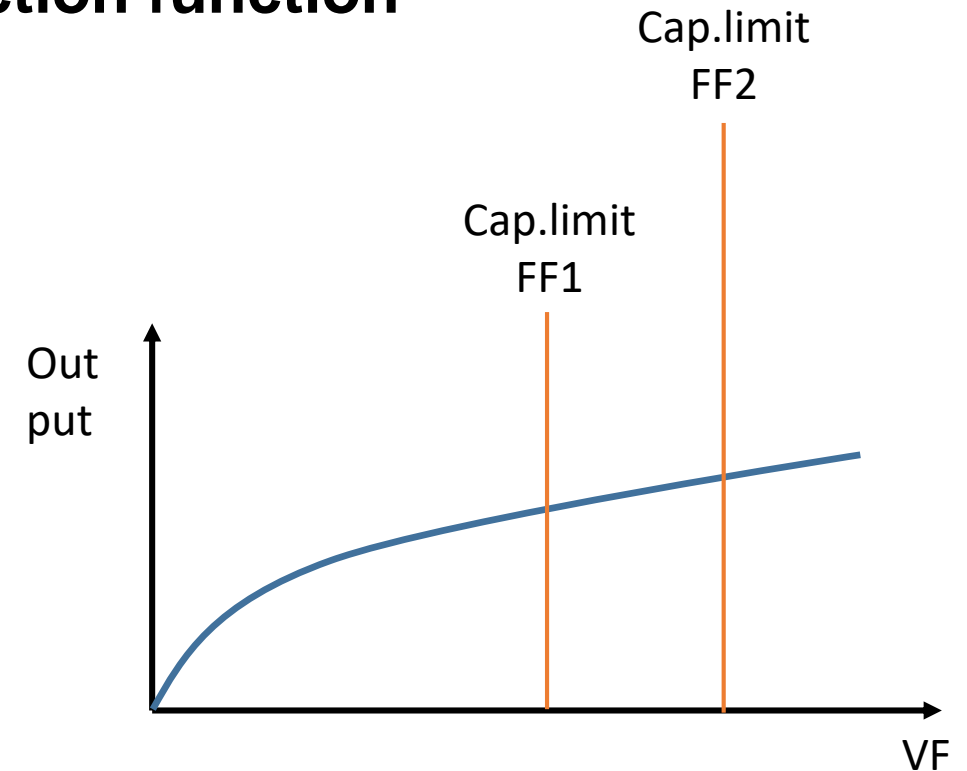
Schematic diagram

# Flexibility – Short term vs. long term

- **Production theory:** Fixed factor(s) and variable factor(s)
- Fixed factor determines **short term production function** and/or **maximum capacity**



**Substitution between FF and VF**



**No substitution**



# Regulation

- **Regulation** tries to generate market results that are as close as possible to the **outcome of a competitive market** – but regulation is always **imperfect**
- Regulatory **decisions** might cover: cost, price level, price structure, quality, investment/capacity, ...
- Different **'types'** of regulation, esp. cost recovery vs. **'incentive' regulation**

# Regulation

- Regulation theory usually assumes that the regulated firm acts as a **profit maximiser** (e.g., private airport operator)
- However:  
Almost all (European) ANSPs are fully **state-owned** (with different institutional framework) => Which **objective function** can be assumed for regulation?
- Example from **economic literature** (Blondiau et al. 2016, JATM):  
ANSP objective function is weighted sum of  
***Consumer surplus + ANSP profits + National interest (incl. ATCO wages)***

- **Incentive regulation:**  
**Pure** price-cap vs. **hybrid** price-caps  
(with different definitions of the term ‘hybrid’)
- (Selected) **Options** within price-cap regulation:
  - Risk sharing – demand (esp. if high share of fixed cost)
  - Risk sharing – cost (esp. if certain cost changes are ‘external’)

# Regulation - The 'quality' dimension

- Regulator determines '**minimum service level**' – otherwise price (or revenue) caps might lead to reduced service levels
- '**Penalty**' if service level below 'minimum'  
(Example: contract between German government and state-owned rail infrastructure provider using several quality indicators with defined 'penalty')
- '**Bonus**' if service level above 'minimum'?

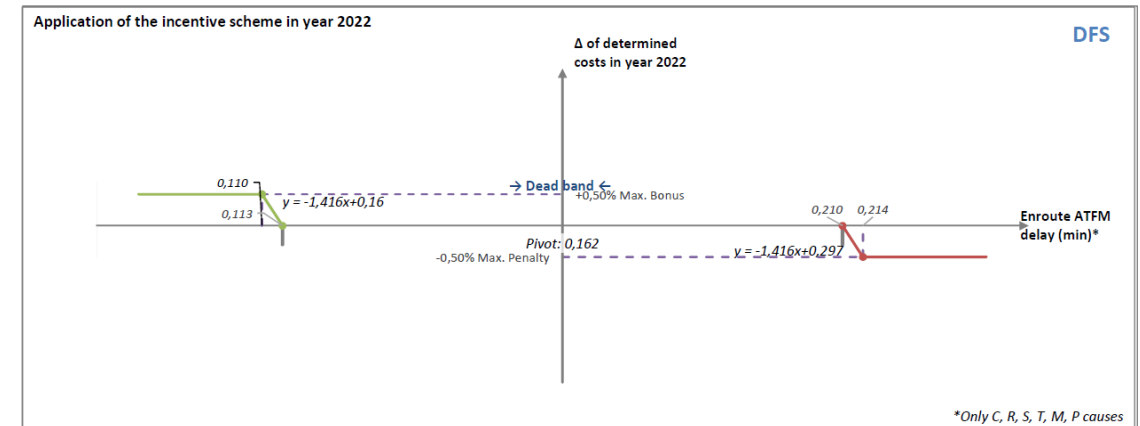
# Regulation - The 'quality' dimension

- Incentivizing quality (as a result of flexibility):
  - Which **indicators** should be used?
  - How **strong** should the incentives be?

- Com. Imp. Reg. 2019/317:

- **Incentive scheme 'capacity'**  
(indicator 'delays')  
Pros and cons?

- (Potential) **interdependencies**  
between flexibility and traffic risk sharing scheme?



Source: Performance Plan Germany

# Alternatives

- **‘Capacity ordering concept’** (one element of CADENZA project):
  - **Contract** between NM and ANSP about capacity provision
  - Traffic (level) risk with NM
  - Flexibility governed by the contract  
(e.g., ordering of  $x$  units of additional capacity  $y$  days in advance costs  $z$  €)
  - So far, only conceptual work

# Summary and conclusions

- Flexibility is **one option** of reducing demand-capacity imbalances (other option demand management)
- Flexibility comes **‘at a cost’** –  
‘Optimum’ level of flexibility rather than maximizing flexibility
- For **theoretical analysis** of state-owned infrastructure providers, assumptions on **objective function** matter
- Current incentive schemes cover flexibility **‘indirectly’**  
(and potential interdependencies with traffic risk sharing)
- Contracts on capacity provision might cover flexibility **‘directly’**

**Thank you very much for your attention!**

**Prof. Dr. Frank Fichert  
Hochschule Worms / Worms University of Applied Sciences  
Erenburger Straße 19  
D-67549 Worms  
Germany**

**fichert@hs-worms.de**