ENSEMBLE
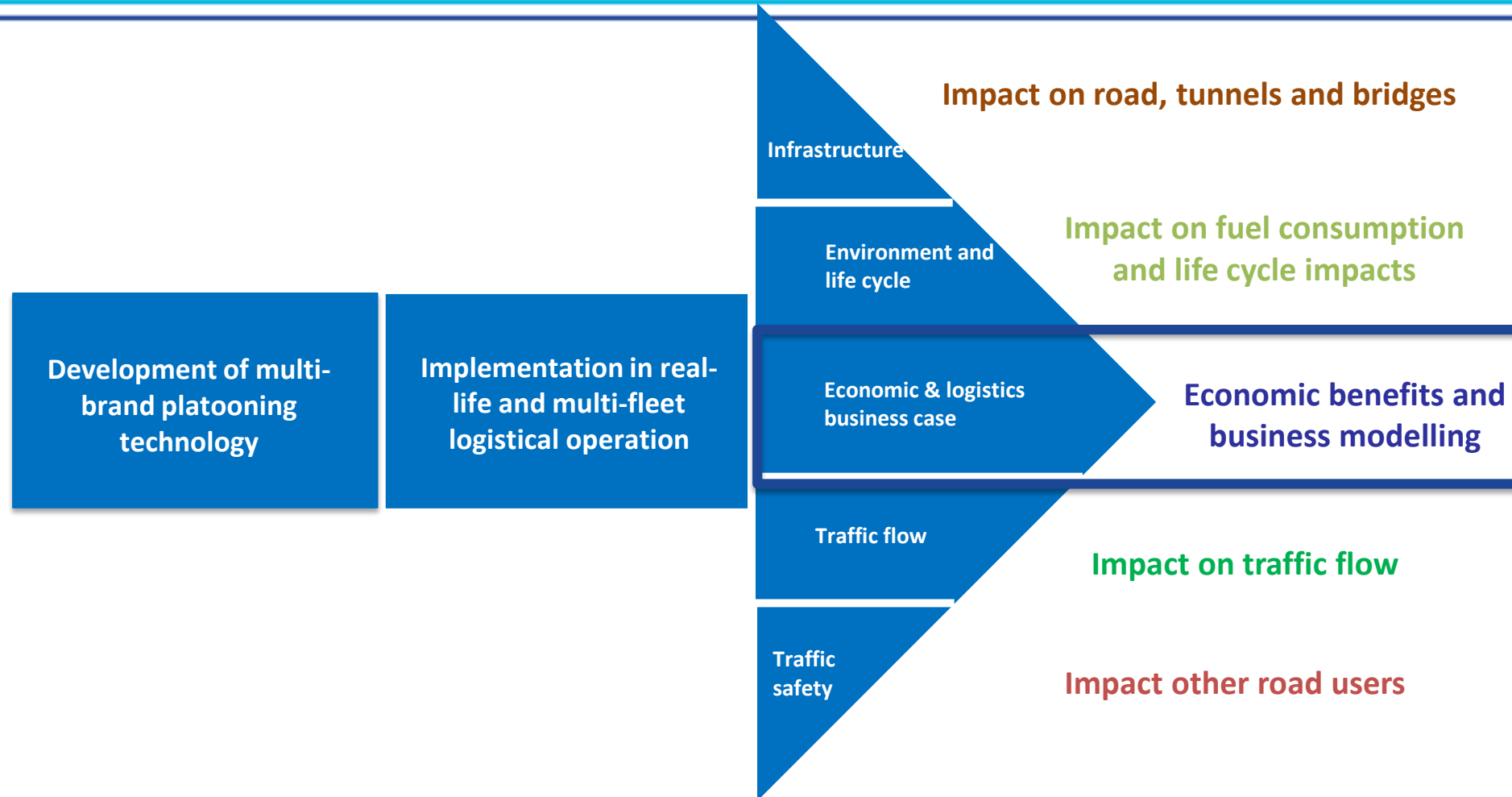
Economic benefits of multi-brand platooning

François Combes, El-Mehdi Aboulkacem

Univ. Gustave Eiffel

# Focus on Economic Benefits

Introduction

- Questions
  - What is the core value of multi-brand platooning?
  - What is the predictable market uptake of the multi-brand platooning technology?
  - What are the external impacts of multi-brand platooning?
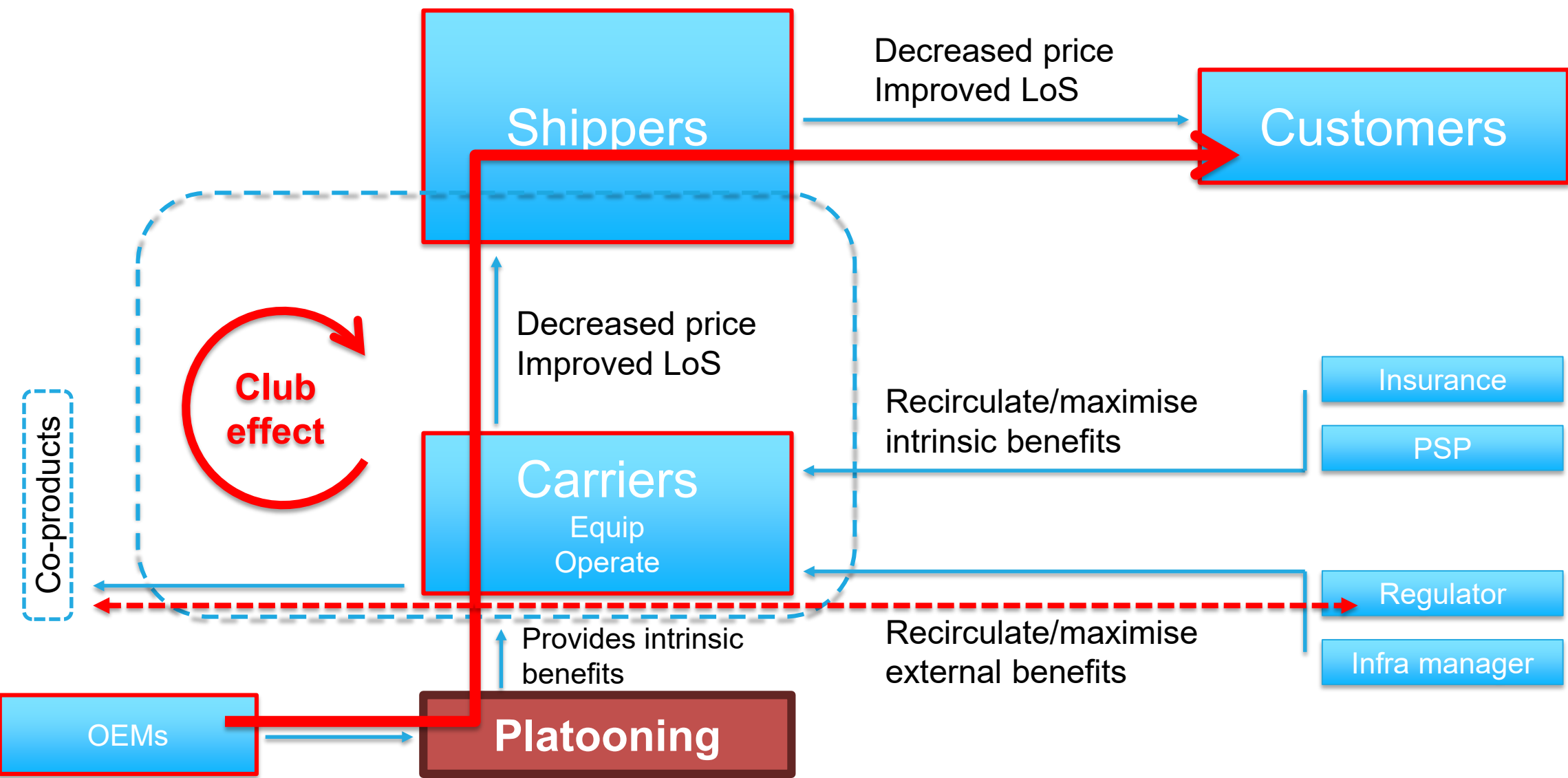
Core value of platooning

- Multi-brand platooning brings **direct financial value** when multiple trucks are together in a platoon, due to:
  - Fuel savings
  - Workforce cost savings in case of partial automation
- Platooning is costly:
  - Equipment costs
  - **Coordination costs**
- The balance must be positive

A complex eco-system…
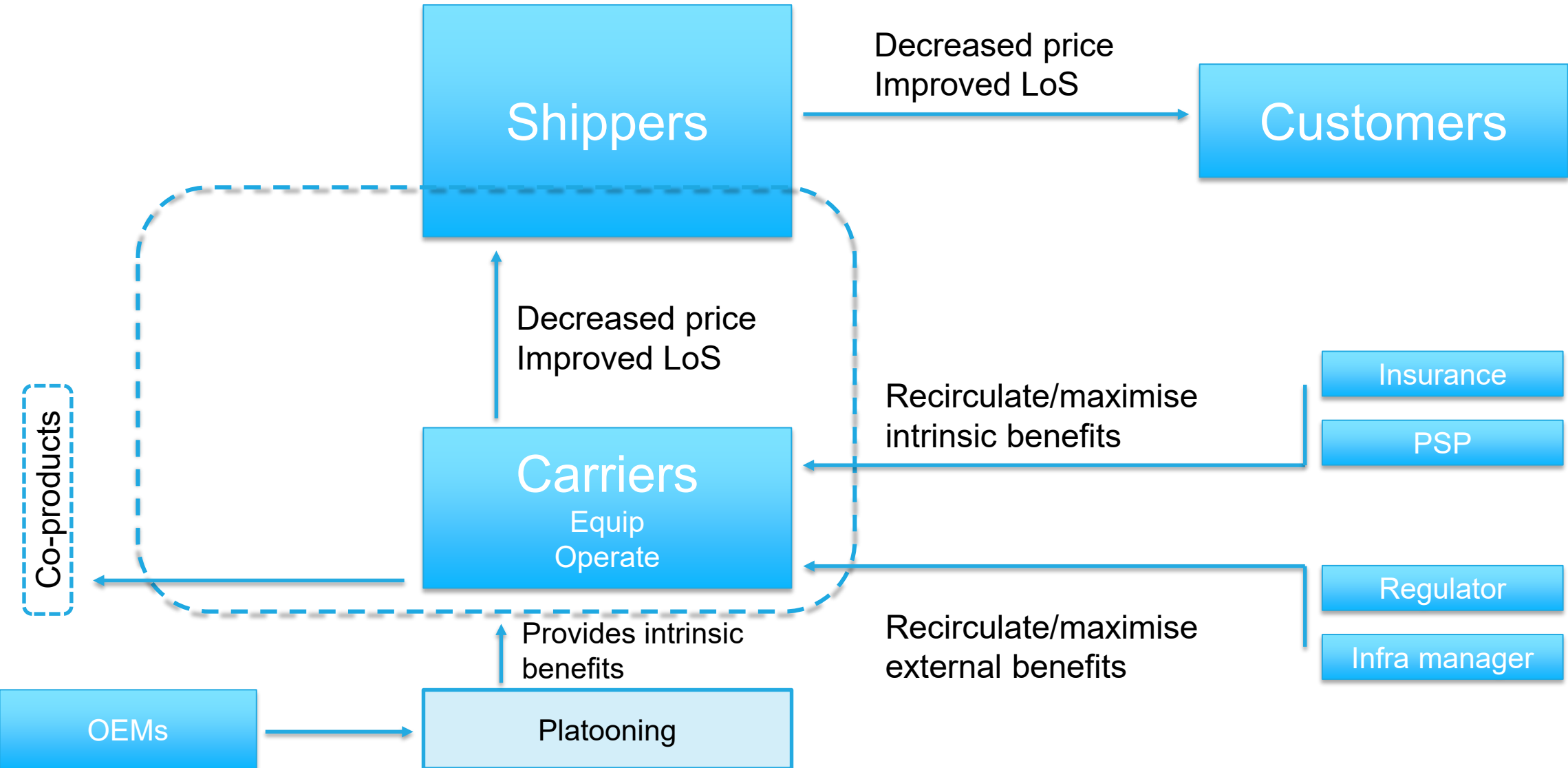
…but a simple value chain

Market uptake

- Two layer of decisions are accounted for
  - 1: platoon formation
  - 2: vehicle equipment
- Two set of assumptions are compared
  - 1: platooning support function (5% fuel savings for following vehicles)
  - 2: platooning autonomous function (0%/10% fuel savings for following vehicles)
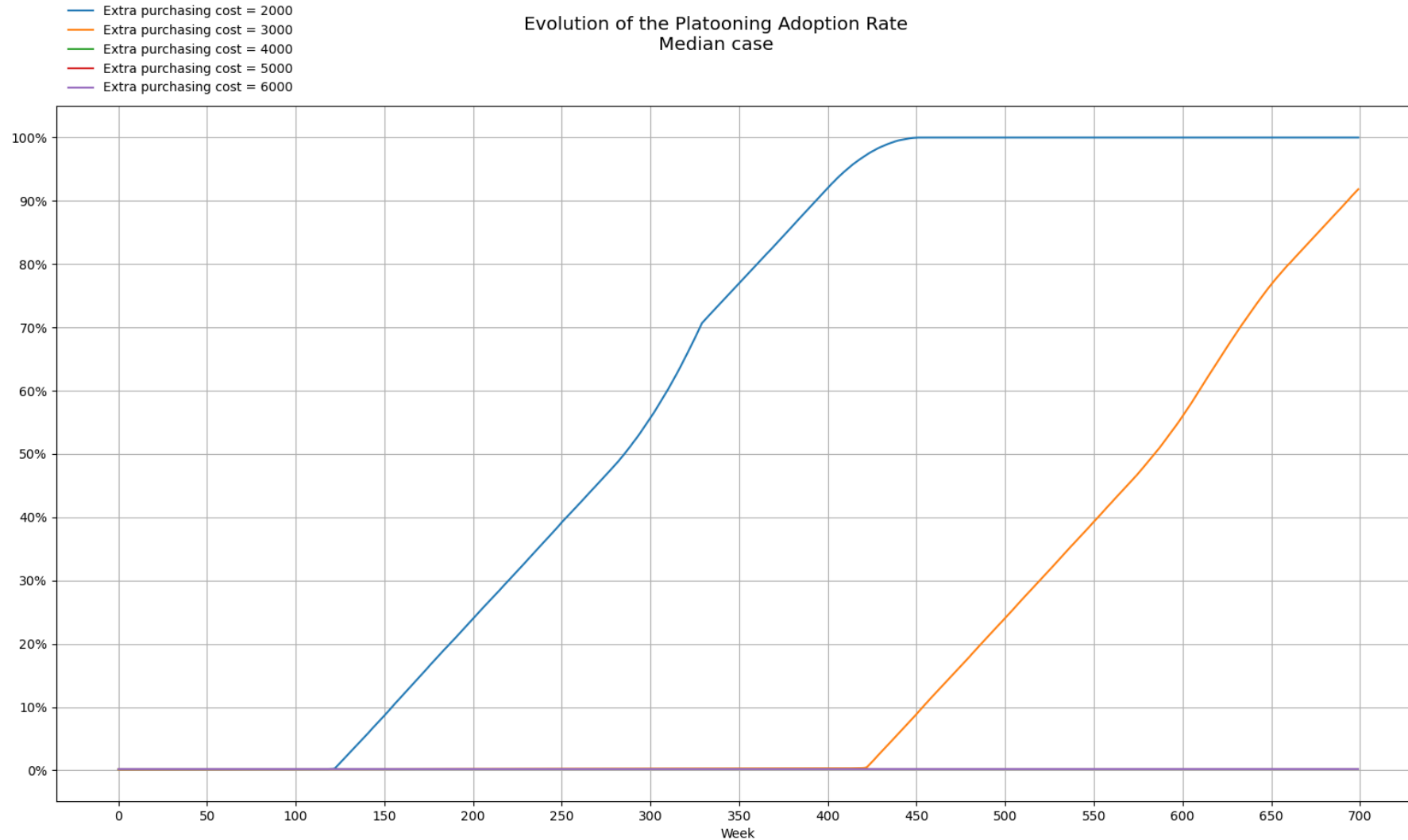
Market uptake

- Two layer of decisions are accounted for
  - 1: platoon formation
  - 2: vehicle equipment
- Two set of assumptions are compared
  - 1: platooning support function (5% fuel savings for following vehicles)
  - 2: platooning autonomous function (0%/10% fuel savings for following vehicles)
- **There is no business case for the platooning support function**
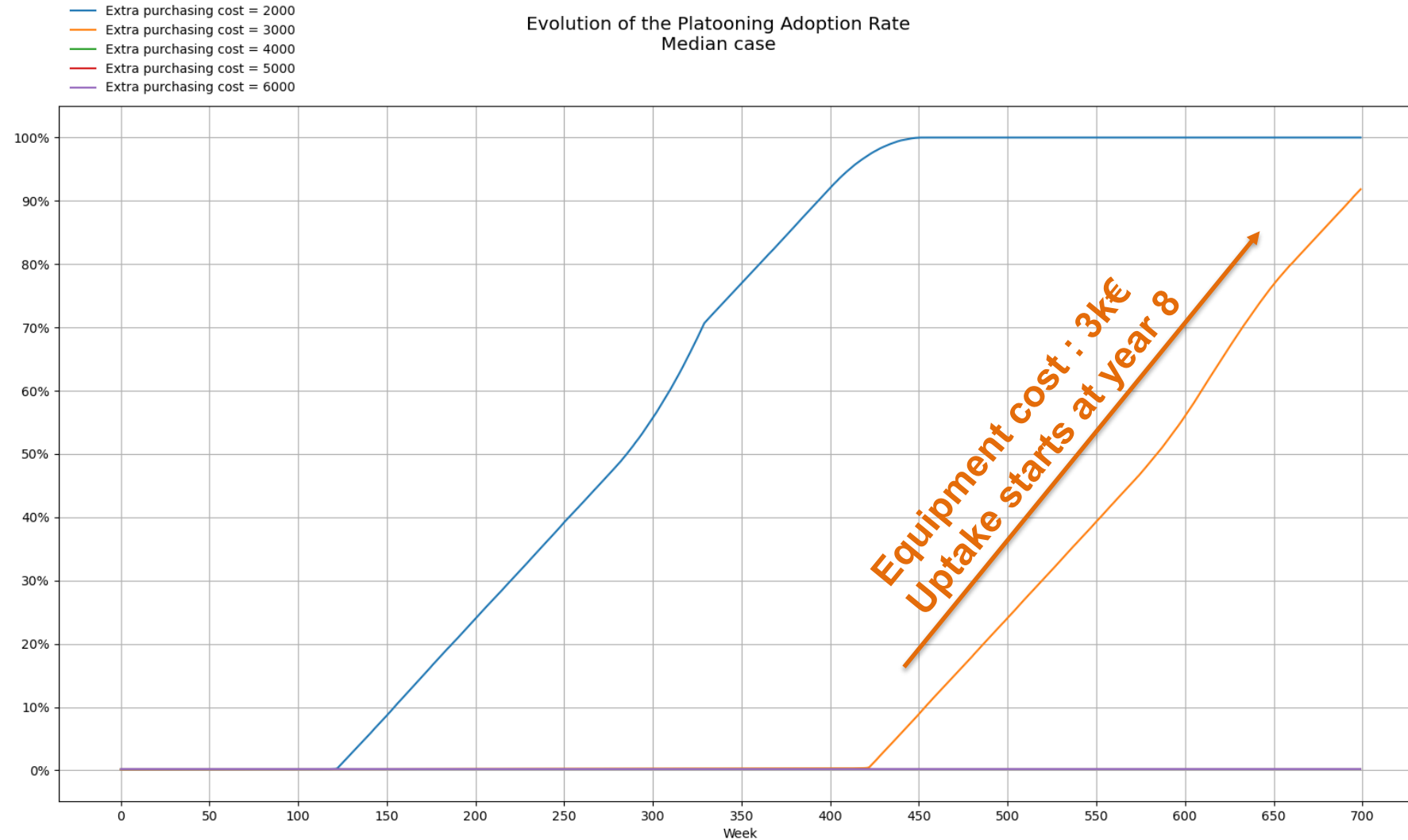
Market uptake

- Two layer of decisions are accounted for
  - 1: platoon formation
  - 2: vehicle equipment
- Two set of assumptions are compared
  - 1: platooning support function (5% fuel savings for following vehicles)
  - 2: platooning autonomous function (0%/10% fuel savings for following vehicles)
- **There is no business case for the platooning support function**
- **There is a business case for the platooning autonomous function**

Platooning autonomous function: market uptake

Evolution of the Platooning Adoption Rate
Median case

Legend:
- Extra purchasing cost = 2000
- Extra purchasing cost = 3000
- Extra purchasing cost = 4000
- Extra purchasing cost = 5000
- Extra purchasing cost = 6000

Platooning autonomous function: market uptake

Evolution of the Platooning Adoption Rate
Median case

Legend:
- Extra purchasing cost = 2000
- Extra purchasing cost = 3000
- Extra purchasing cost = 4000
- Extra purchasing cost = 5000
- Extra purchasing cost = 6000

Equipment cost : 3k€
Uptake starts at year 8

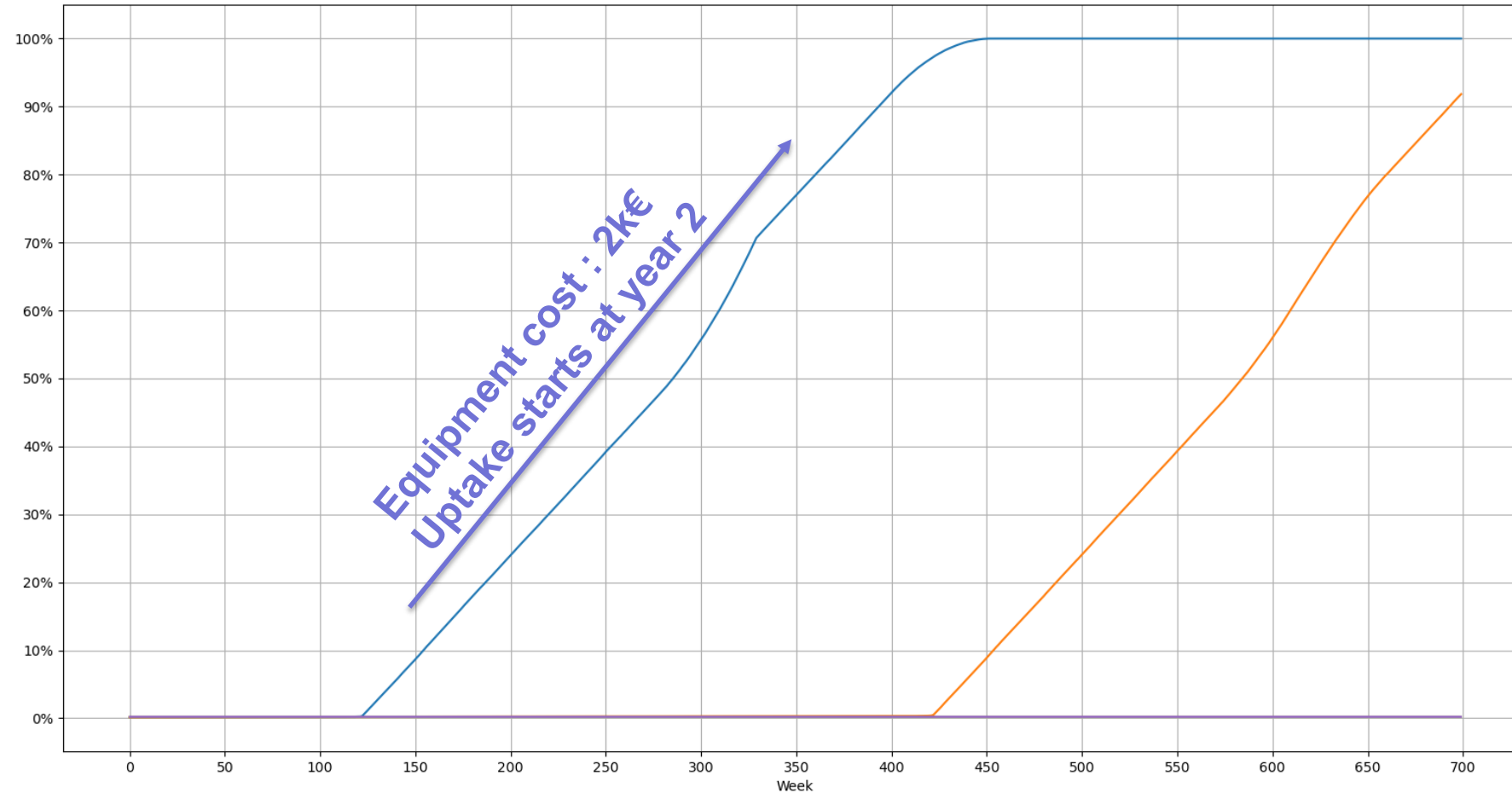# Platooning autonomous function: market uptake

Evolution of the Platooning Adoption Rate
Median case

Legend:
- Extra purchasing cost = 2000
- Extra purchasing cost = 3000
- Extra purchasing cost = 4000
- Extra purchasing cost = 5000
- Extra purchasing cost = 6000

Equipment cost : 2k€
Uptake starts at year 2

Platooning autonomous function: market uptake

Median case:
~1% financial savings
~5% fuel savings

Evolution of the Platooning Adoption Rate
Median case

Extra purchasing cost = 2000
Extra purchasing cost = 3000
Extra purchasing cost = 4000
Extra purchasing cost = 5000
Extra purchasing cost = 6000
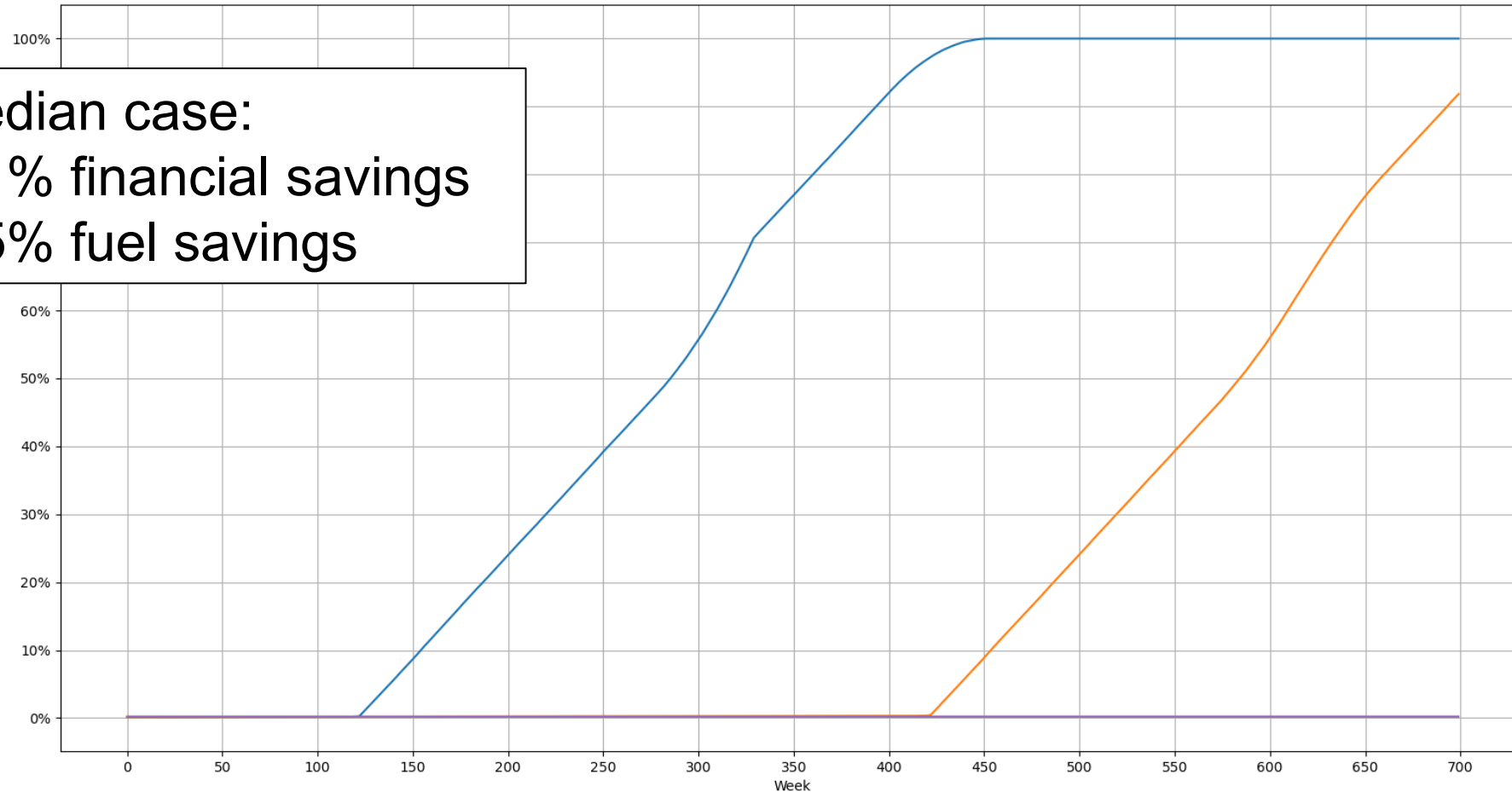
Sensitivity test: increasing fuel prices

The business case can improve (example here: fuel prices increasing in time)

Legend:
- Extra purchasing cost = 2000
- Extra purchasing cost = 3000
- Extra purchasing cost = 4000
- Extra purchasing cost = 5000
- Extra purchasing cost = 6000

Evolution of the Platooning Adoption Rate
5% fuel price increase
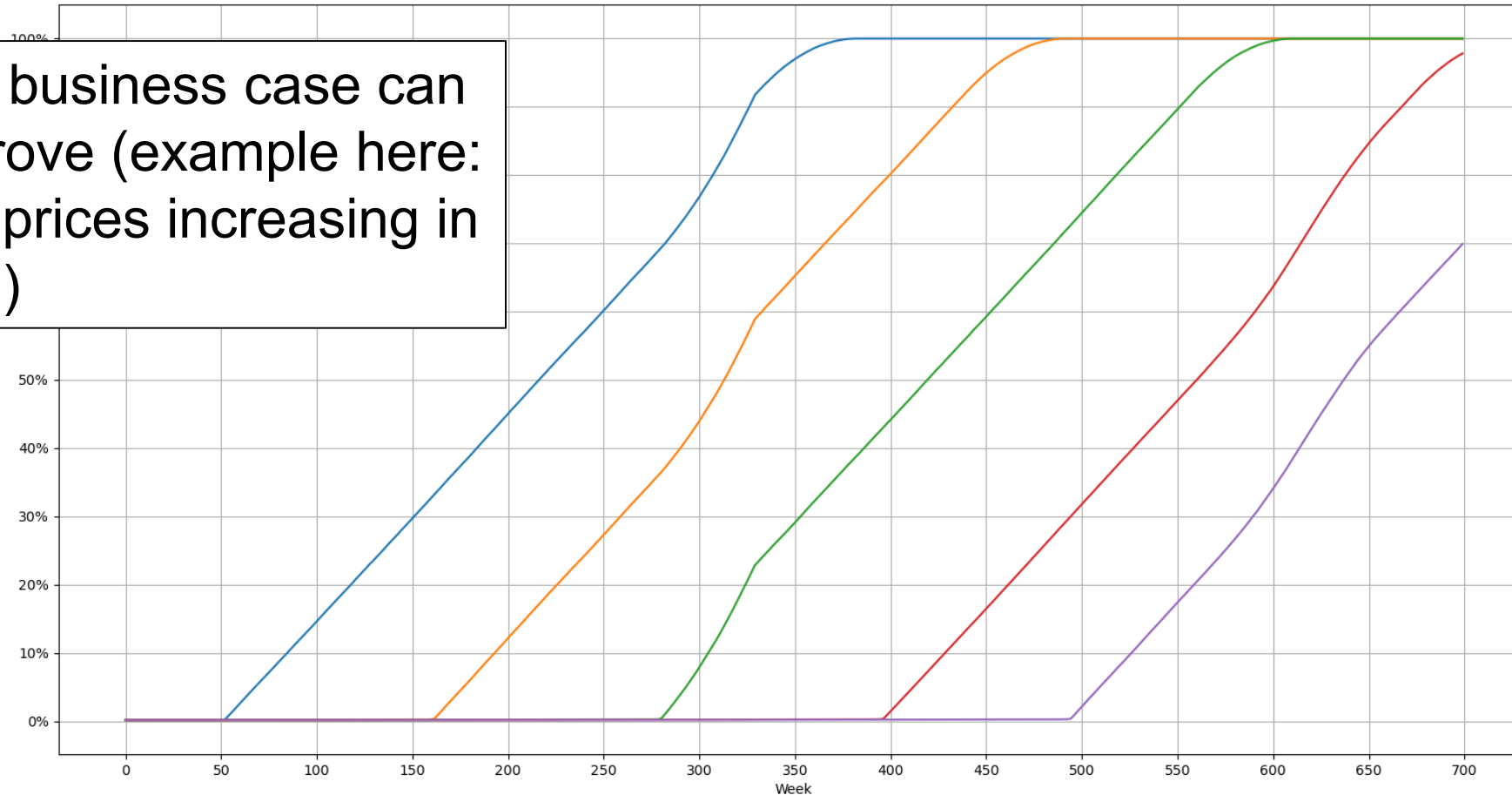
Main conclusions

- The benefits of platooning depend on how often a truck is in a platoon, and for how long
- There is a coordination cost of platooning
  - There are network externalities
  - Interoperability is critical
  - The net benefits of platooning are lower than the gross benefits
- With the Platooning Support Function, there is no business case
- With the Platooning Autonomous Function, there is a business case

Thank you for your attention

ENSEMBLE

platooningensemble.eu