

Trade and Travel:

the potential of Tradeable mobility credits as a means to manage and steer travel demand

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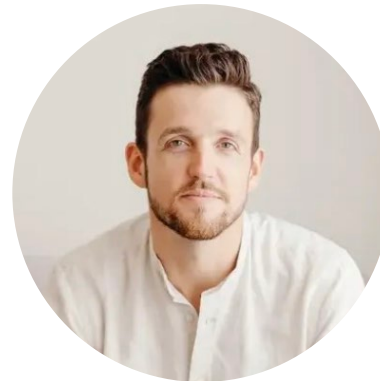
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Background



Congestion



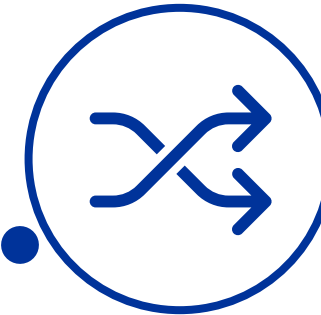
Space



Emissions



Noise



Change
modal shift



Reduce
demand management

Solutions



Push measures



Pull measures



TRADEABLE MOBILITY CREDITS



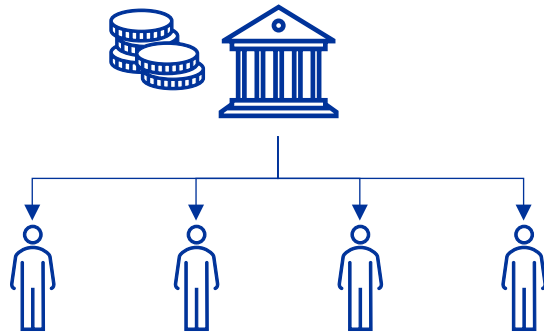
Tradable Mobility Credits



How it works?

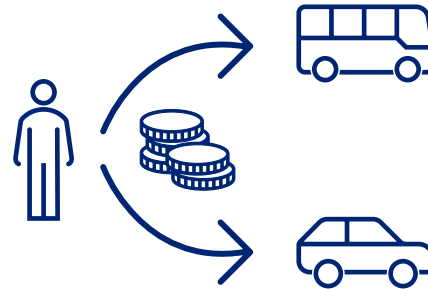


Allocation



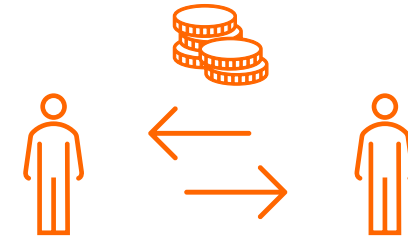
- ❖ Equally to all
- ❖ Based on needs
- ❖ Based on socio-economic status

Payment



- ❖ Direct costs
- ❖ Externalities
 - ◇ Emissions
 - ◇ Noise
 - ◇ Safety

Trading



- ❖ P2P
- ❖ Intermediary
- ❖ Credit "bank"

A busy city street scene with pedestrians and cyclists. The image shows a diverse group of people walking and riding bicycles on a paved path. In the foreground, a man in a brown suit and tie walks towards the left, carrying a briefcase. To his right, a woman in a pink coat is talking on a mobile phone. Further right, a man in a grey jacket and orange cap walks towards the camera. In the center, a woman wearing a grey helmet and jacket is riding a bicycle. Other people in winter clothing are visible in the background, some walking and some on bicycles. The scene is brightly lit, suggesting a sunny day. The text "Behavioural research" is overlaid in the center of the image.

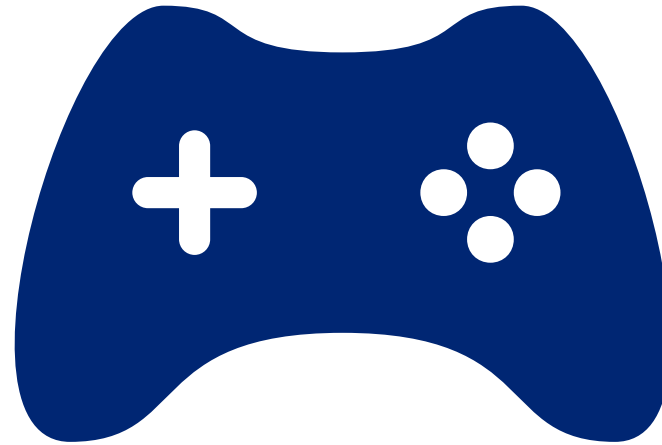
Behavioural research

Trade & Travel



WiFi:

Anantara_Krasnapolsky

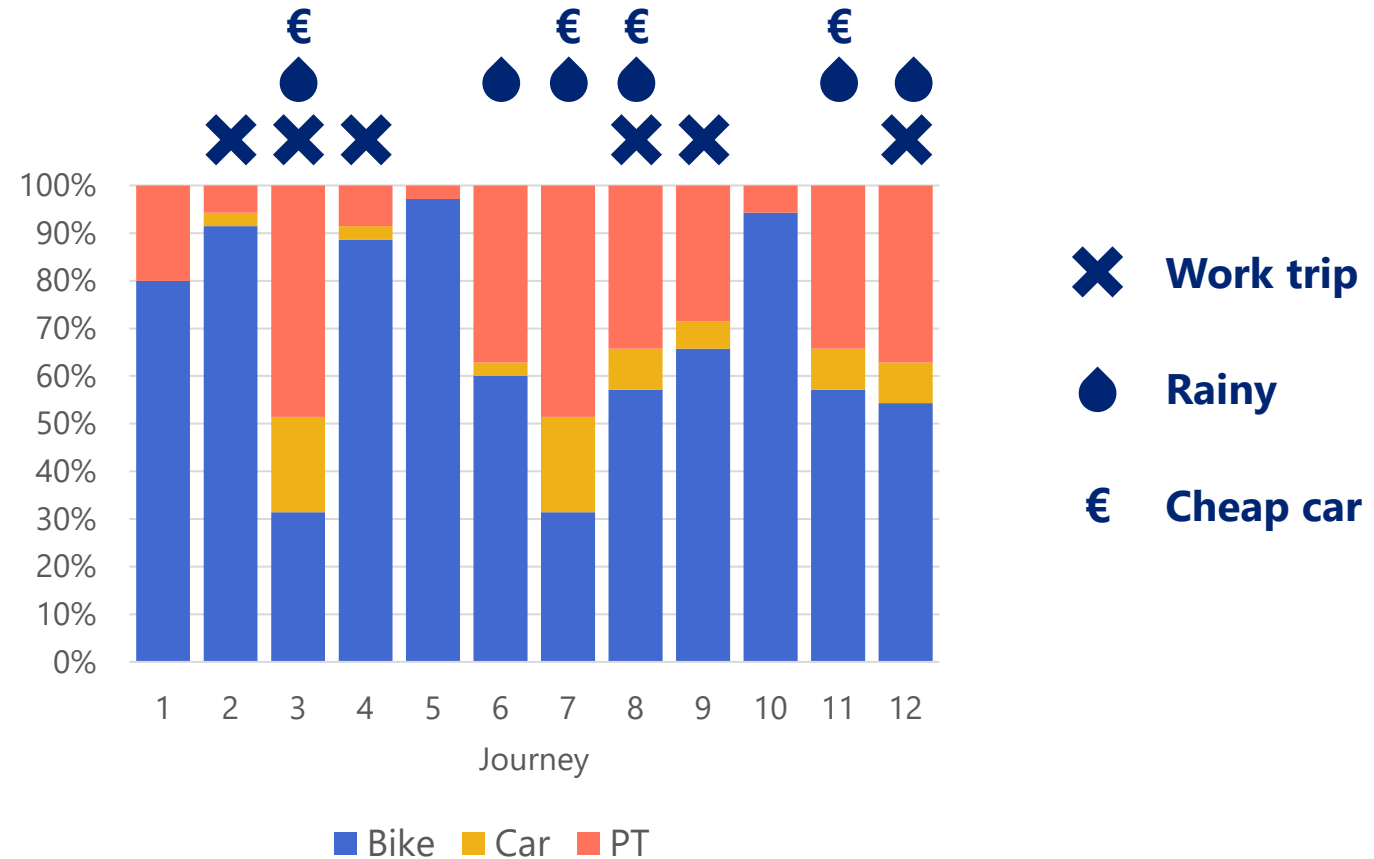


Let's play

RESULTS

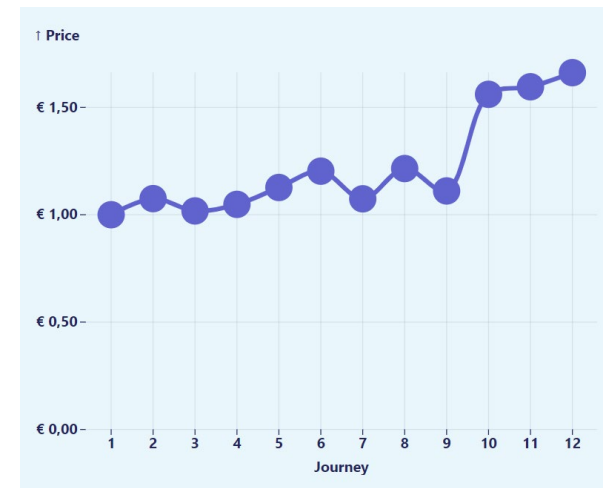
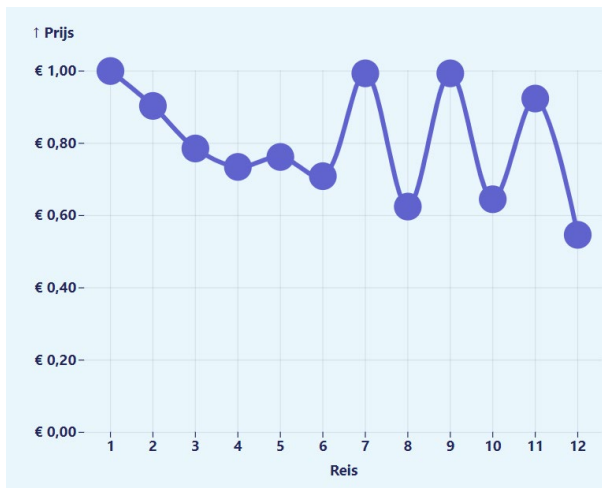
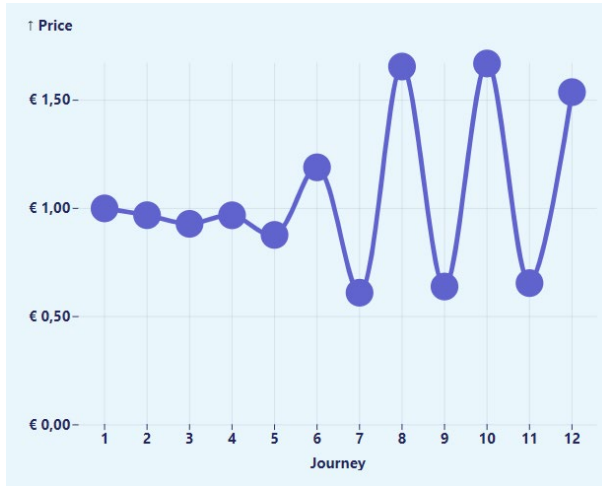


Results · Live session · Mode choice



Amsterdam
23.04.2024
43 participants

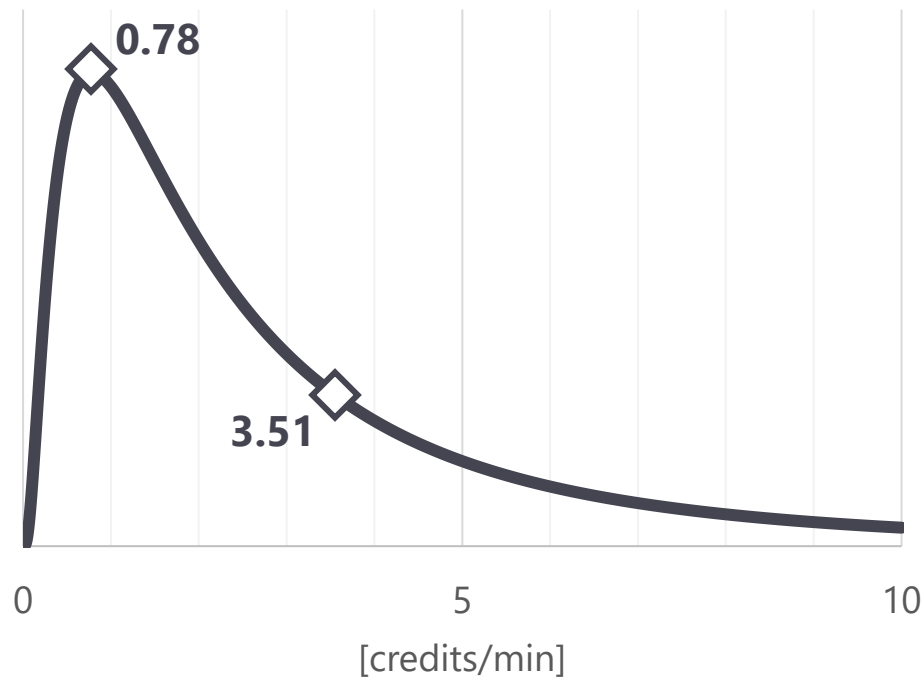
Results · Live session · Trading



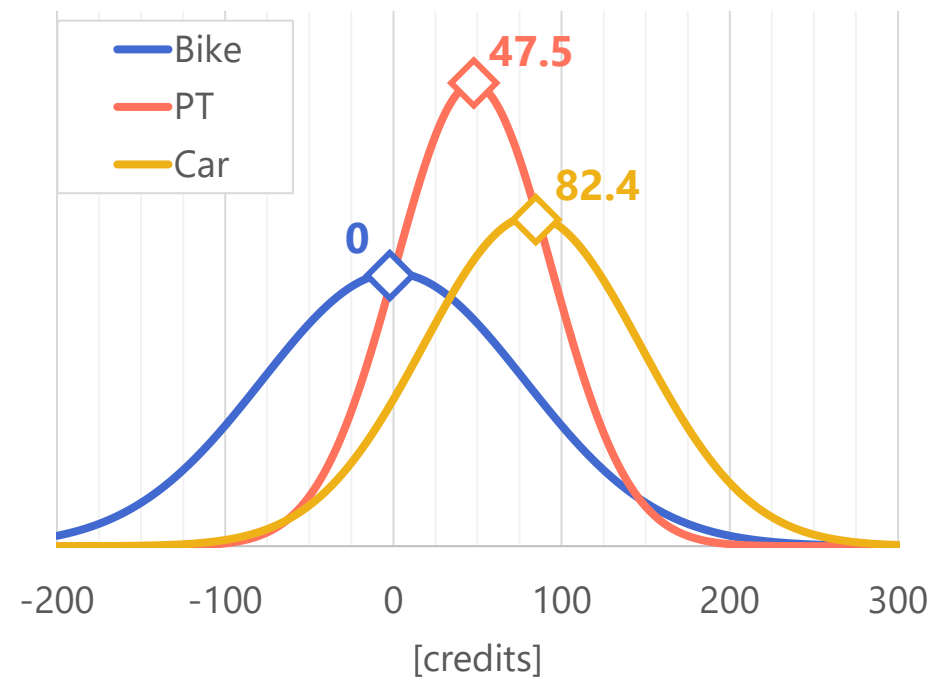
Results · Online survey · Mode choice



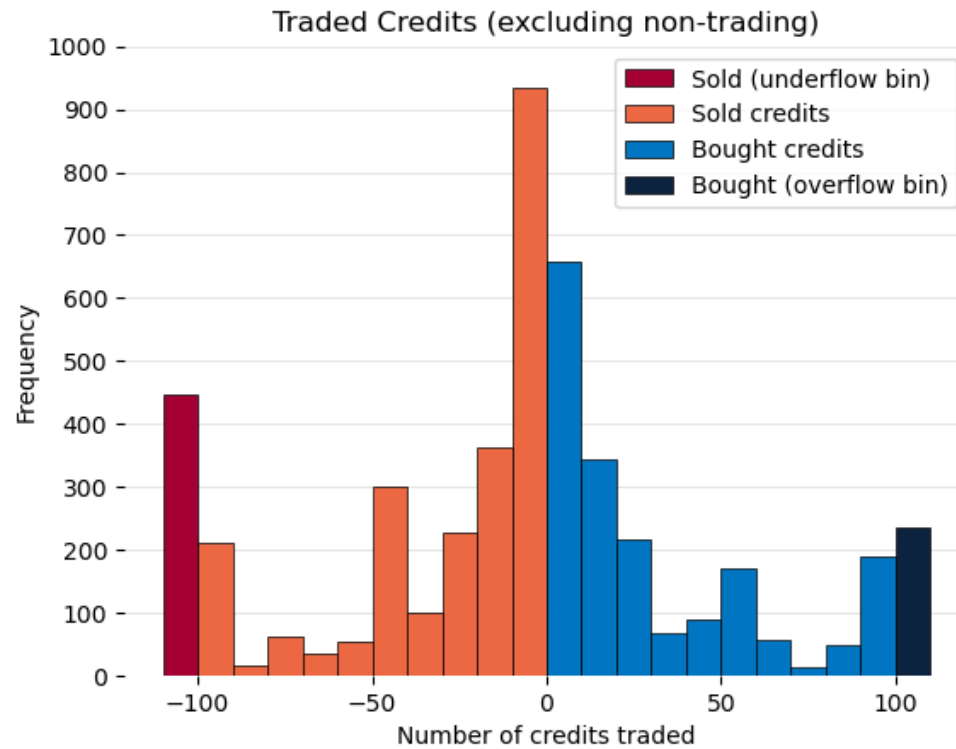
Willingness to pay for travel time



Willingness to pay for modes



Results · Online survey · Trading



11,004 opportunities

6,387 no trading

2,063 buying

2,554 selling

Results · Online survey · Trading



To buy or not to buy

- ❖ BUY is primarily driven by the **credit balance**
- ❖ SELL driven by **exchange rate**
- ❖ The likelihood of buying or selling increases closer to the 'end'

How much?

opposite outcome for the quantity

- ❖ BUY is strongly influenced by the **exchange rate**
- ❖ SELL is influenced by the current **credit balance**

An aerial night-time photograph of a multi-lane highway. The road is filled with cars, their headlights and taillights creating a dense pattern of light. The highway curves to the right. On the right side of the road, there is a grassy embankment with some trees and a fence. The overall scene is illuminated by streetlights and the lights from the vehicles themselves.

**Large-scale
simulation
experiment**

Setup



- ❖ Model the decisions of 10,000 travellers in Amsterdam under a TMC scheme

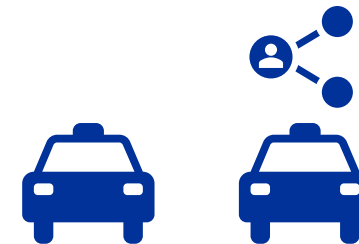
- ◇ Credit buying and selling
- ◇ Mode choice

- ❖ Each mode is charged according to its emissions (up to 15 credits/km)

- ❖ Evaluate different TMC schemes (credit allocation and mode charge)

- ❖ Compare outcomes to alternative demand management strategies

- ◇ License Plate Rationing (LPR)
- ◇ Congestion Pricing (CGP)
- ◇ No demand management (None)

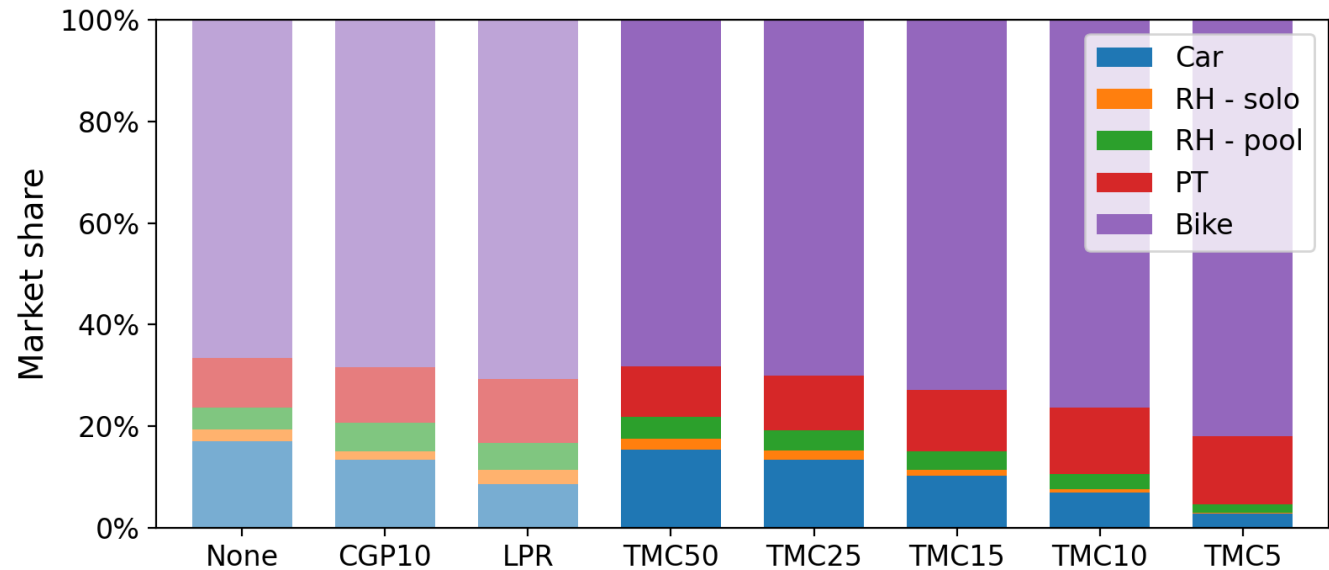
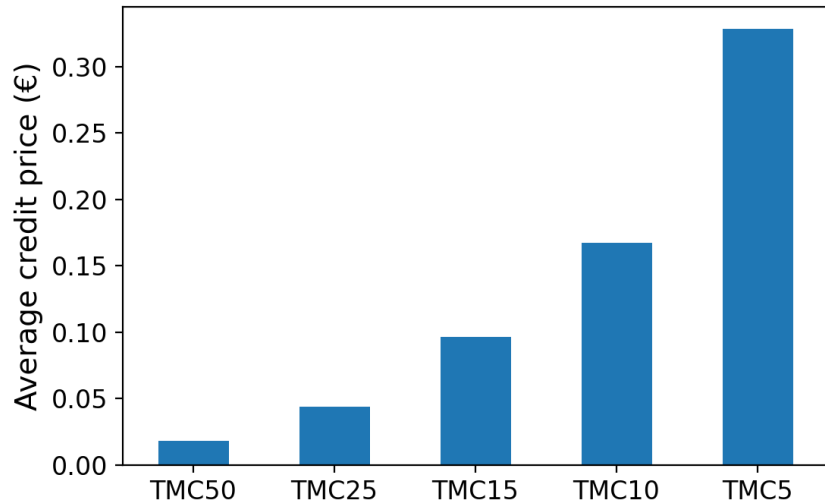


Credit supply



Five credit schemes

50, 25, 15, 10 or 5 credits allocated to each traveller (each day)

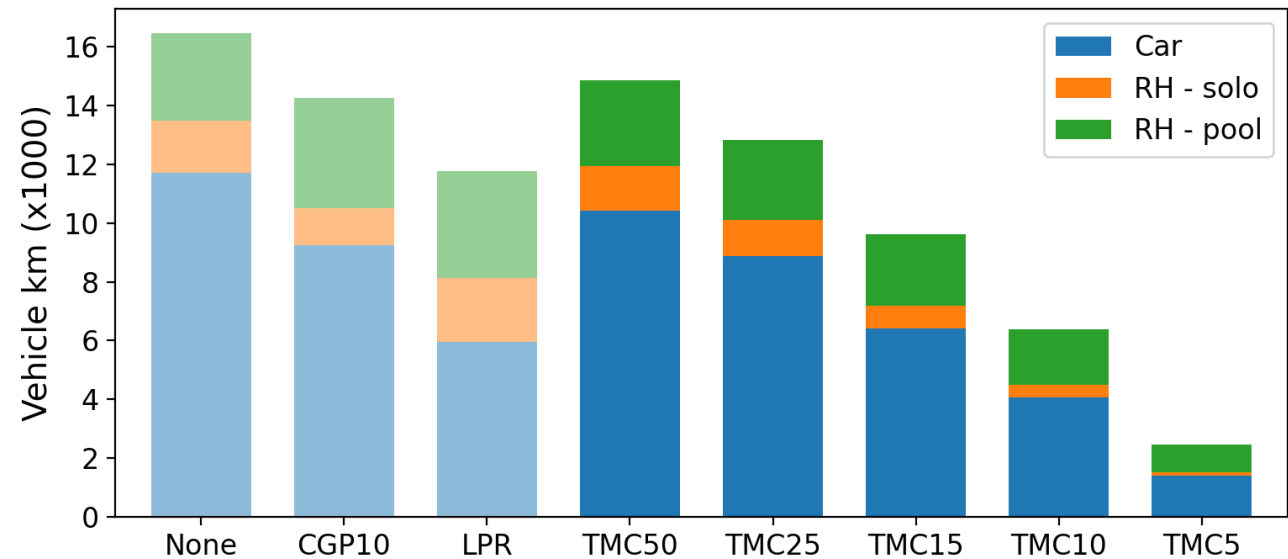
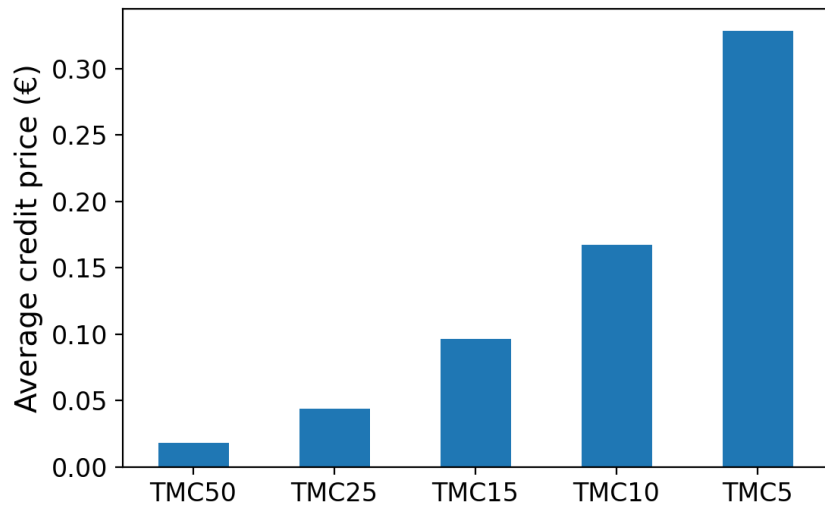


Credit supply



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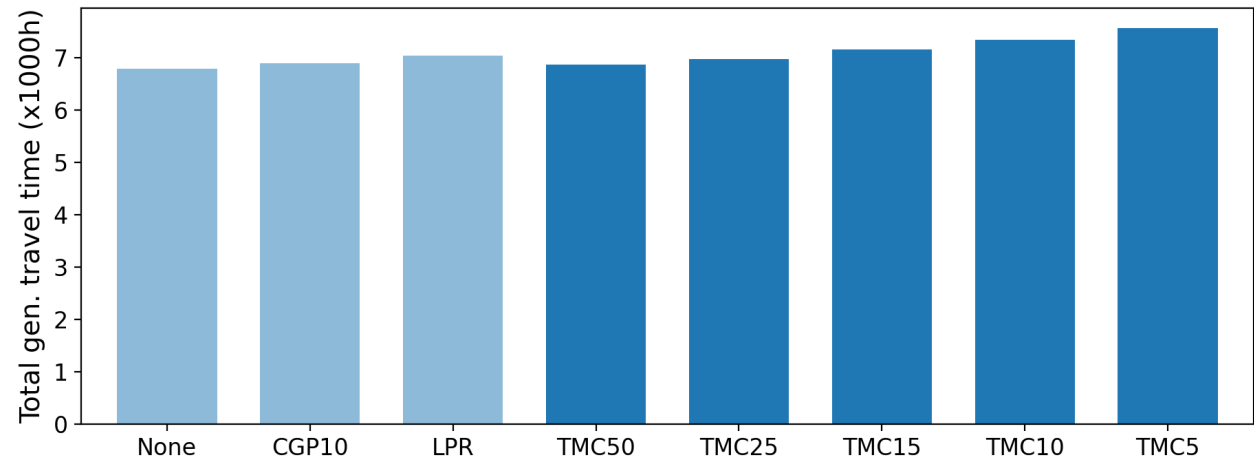
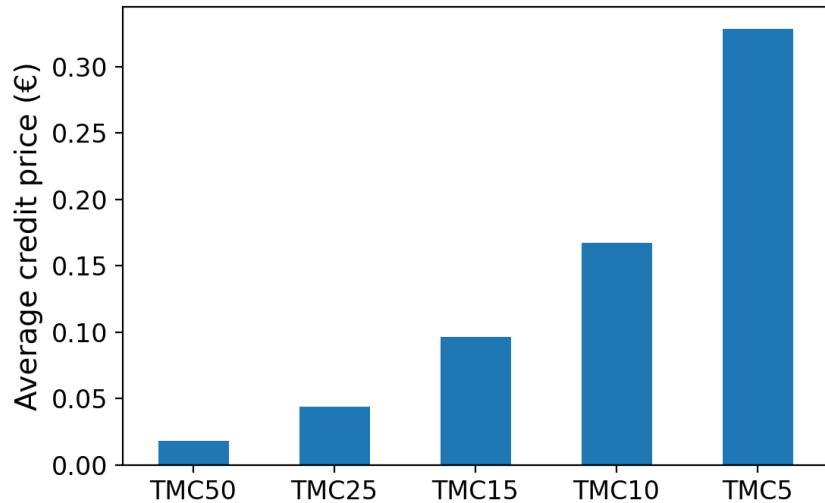


Credit supply



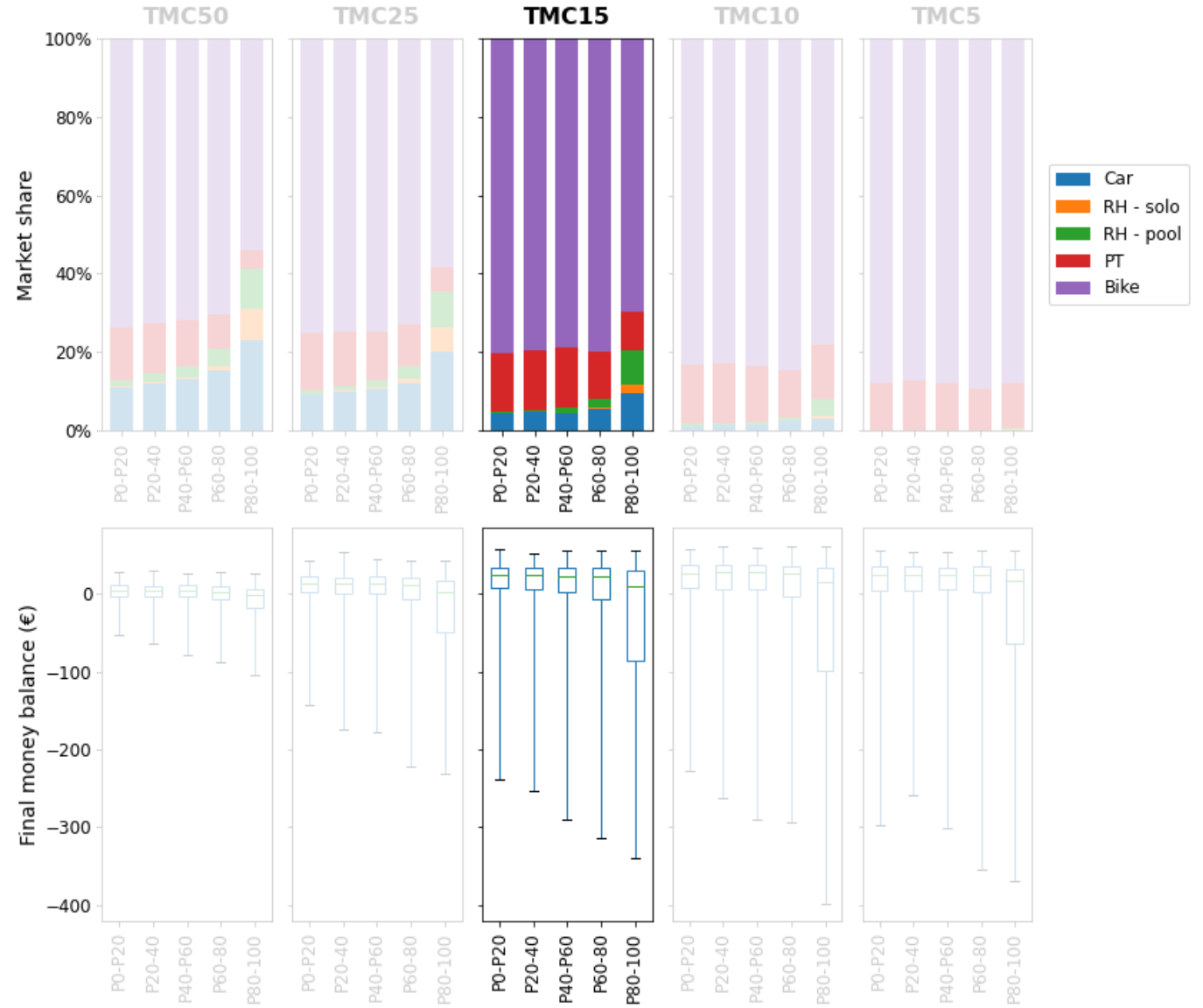
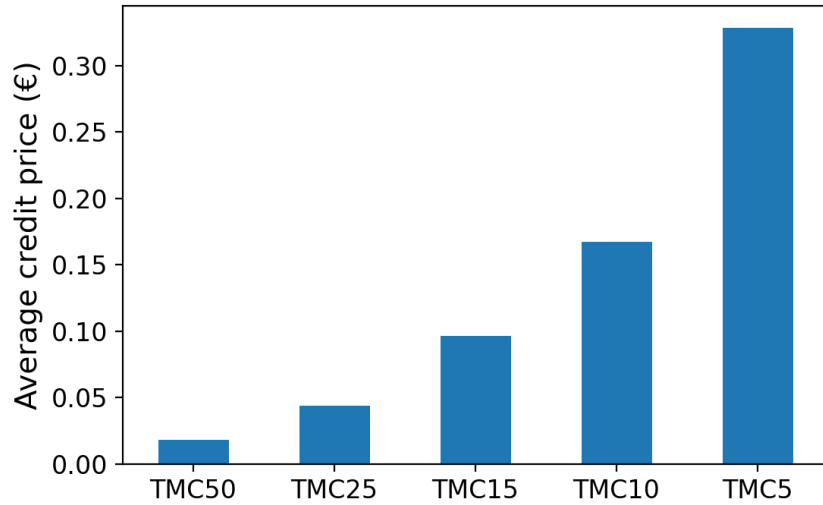
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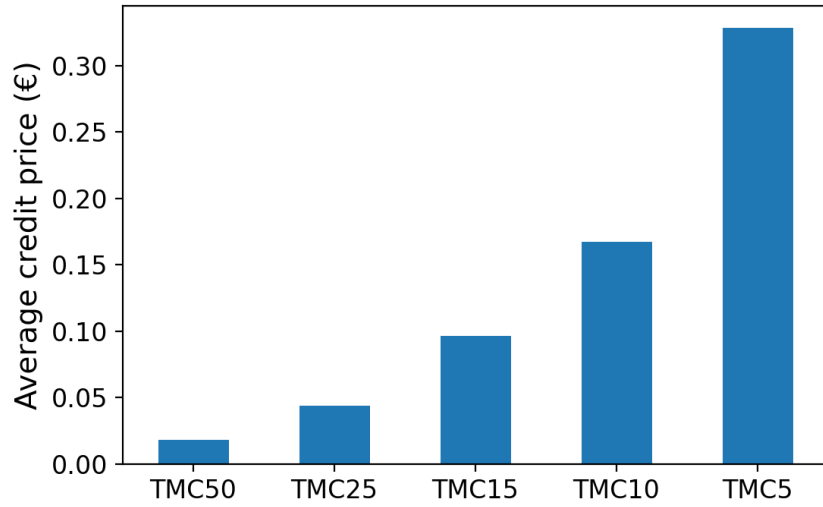
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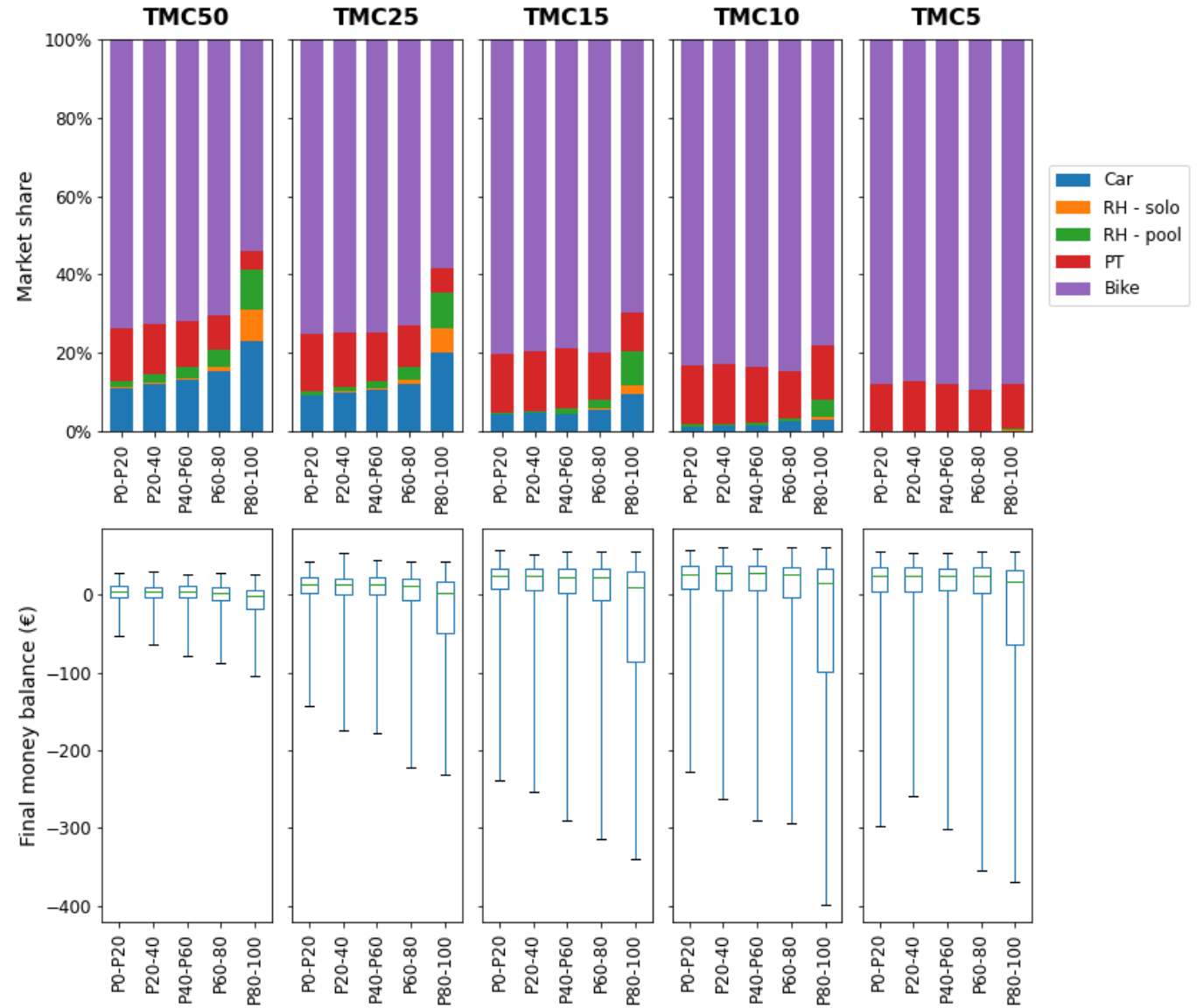
Five credit schemes

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Credit supply is a key determinant for TMC effectiveness

Modal shifts in all income segments



Credit allocation



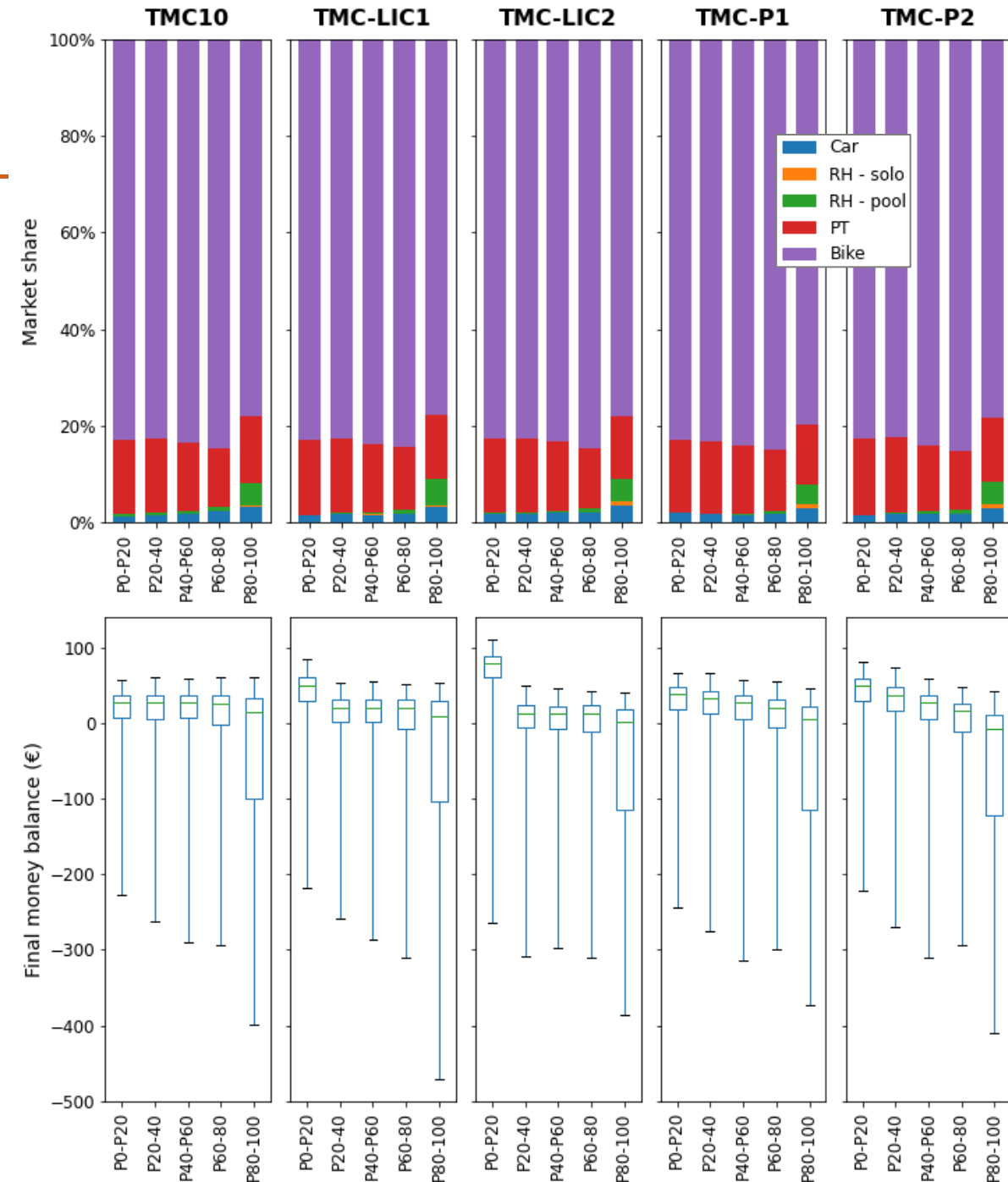
Credits allocated based on travellers' Value of Time (VoT)

- Lowest 20%-VoT receives more credits (LIC)
 - Proportional to VoT (P)

Moderate and more extreme scenarios

The allocation of credits in the population can be an effective redistribution instrument

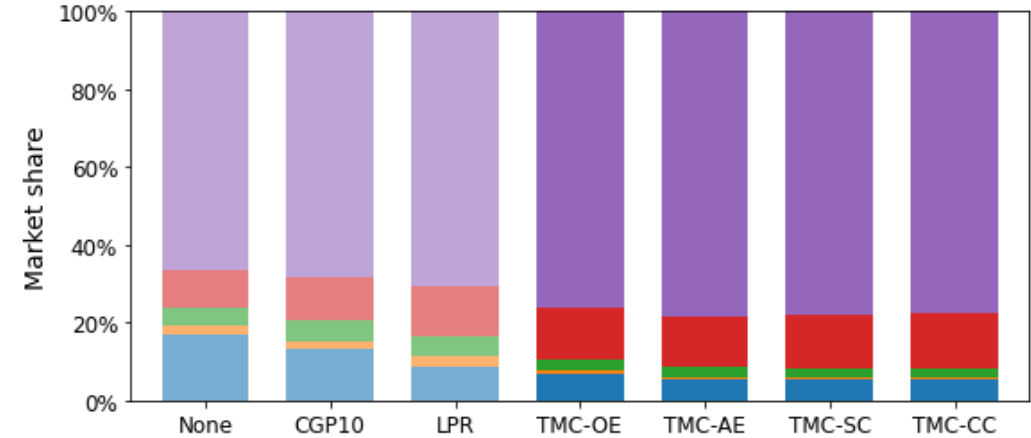
Whether it will lead to better accessibility for low-income individuals is highly uncertain



Emission type & location



Charging scheme					
Operational CO ₂ emissions (OE)	0	2	10	15	10
All CO ₂ emissions (AE)	0	4	12	12	8
Space consumption (SC)	1	1	10	15	10
Additional credit charge for cars in city centre (CC)	0	Centre:	14	21	14
		Elsewhere:	8	12	8



Remarkably, higher bicycle charge leads to more bike trips!

Shows that TMC is not suited for boosting individual modes / directing specific modal shift!

Thank you!

Questions?

