# Sustainable Tariff: a bridge between citizens, utilities and regulators.

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# Research Questions

**RQ1:** Can we build a *sustainable* tariff?

**We think so, event if it is challenging!**

**RQ2:** Is *information* a tool that can be used to build a sustainable tariff?

**Yes, if is a way to enhance co-construction**

**RQ3:** Which are the *levers* we can use to build a sustainable tariff, via the provision of *easy, accessible* and *clear information?*

**Cost, Satisfaction and Trust**

# Research Questions: need of a definition

**RQ1:** Can we build a *sustainable* tariff?

English: sustainability | Example sentences | Trends

**Definition of 'sustainability'**

## sustainability

**in British English**

Word Frequency

(sə ˌsteɪnəˈbɪlɪtɪ)

**NOUN**

1. *economics*
   the ability to be sustained, without causing problems such as inflation

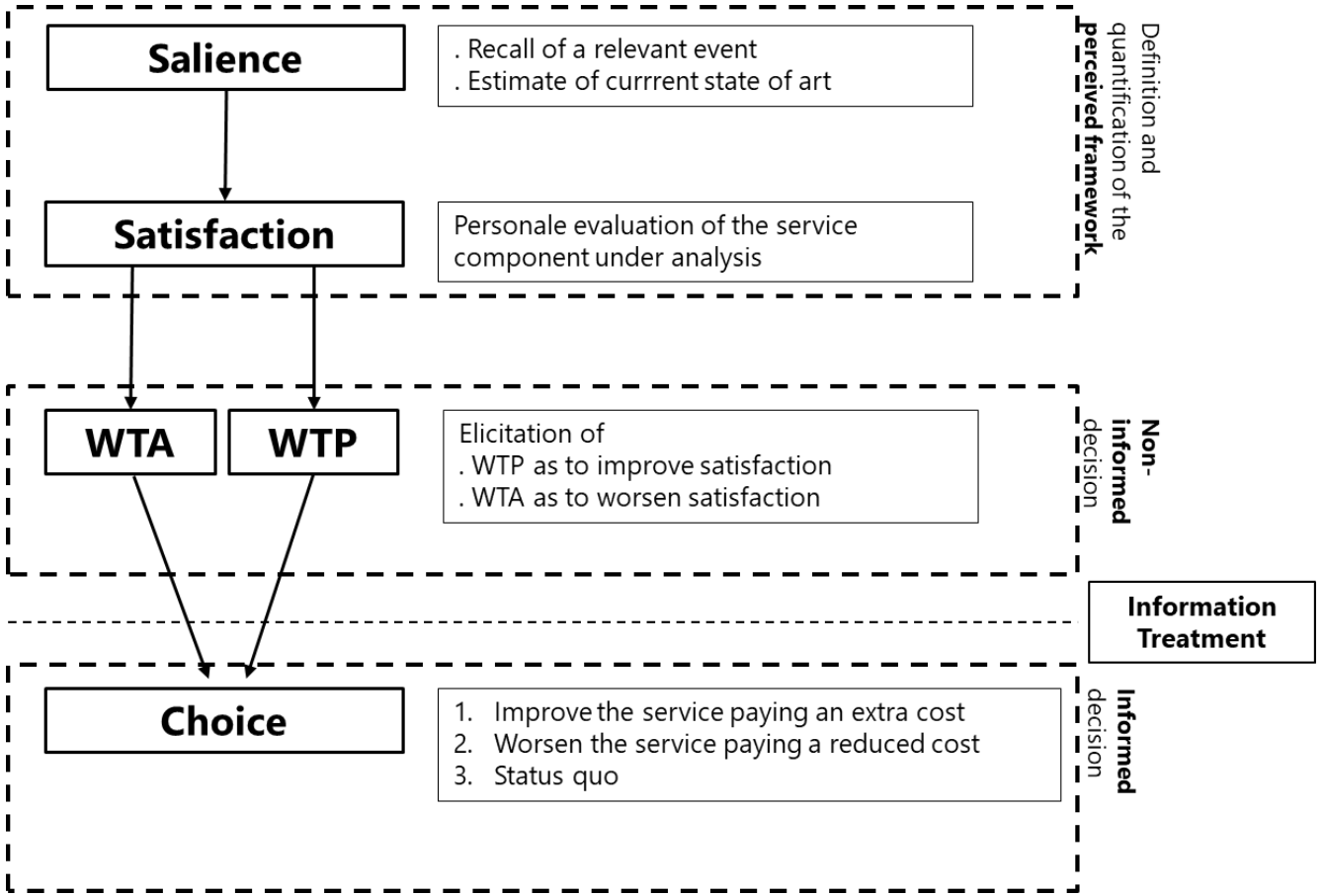
   *doubts about the sustainability of the current economic expansion*

2. *ecology*
   (of economic development, energy sources, etc) the ability to be maintained at a steady level without exhausting natural resources or causing severe ecological damage

   *the growing concern about environmental sustainability*

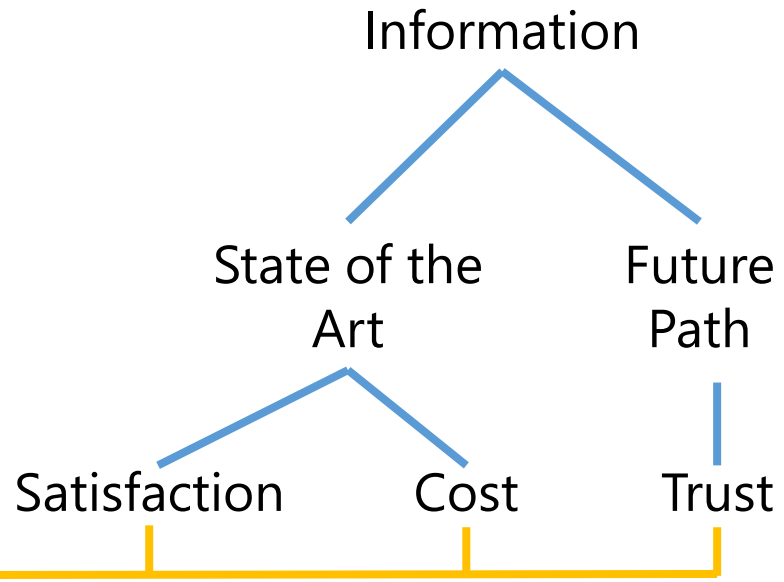
# Research Questions: provision of relevant information

**RQ2:** Is *information* a tool that can be used to build a sustainable tariff?



# Research Questions: from *positive* to *normative analysis*

**RQ3:** Which are the *levers* we can use to build a sustainable tariff, via the provision of *easy, accessible and clear information?*

# Information treatment: pillars and intuition

## Pinpointing some results and intuitions

- Information given were:
  - *Clear* in wording
  - *Easy to understand*, i.e. close to daily experience
  - *Accessible*, automatically provided on screen
  - *Neutral*

- Information helped respondents (assumptions)
  - Give broader picture, thus "objectivizing" the perception*
  - Educate on duties of water utilities
  - Identify true destination of funding → increase trust

**Objective vs Perceived Quality*

# The effects of information

## Participants revise upward their willingness to pay

| | | EX-ANTE | | | EX-POST | | |
|---|---|---|---|---|---|---|---|
| | **WTP** | **Affordable cost** | **High cost** | **Fully satisfied** | **Improving scenario** | **Status Quo** | **Worsening scenario** |
| Water loss | 4,2% | 13% | 84% | 3% | 54% | 30% | 16% |
| Supply interruption | 3,7% | 15% | 62% | 23% | 31% | 50% | 19% |
| Potability | 4,2% | 34% | 44% | 23% | 44% | 42% | 14% |
| Sewerage | 3,8% | 17% | 72% | 11% | 40% | 42% | 18% |
| Depuration | 4,3% | 17% | 69% | 14% | 48% | 38% | 14% |
| Mean | 4% | 19% | 66% | 15% | 43% | 40% | 16% |

# Behind the scenes …

## How information affected participants choice

| ex-ante \ ex-post | Improving scenario | Status Quo | Worsening scenario |
|---|---|---|---|
| **Affordable cost** | Coherent (12%) | Coherent (27%) | Convinced (27%) |
| **High cost** | Disappointed (3%) | Satisfied (4%) | Coherent (12%) |
| **Fully satisfied** | Over Satisfied (1%) | Coherent (9%) | Altruistic (4%) |

# Leverages driving choices: some possible policy?

## Model: Multinomial Logit + Marginal Effects

$$\Pr(i) = \frac{\exp(\beta' \boldsymbol{x_i})}{\sum_{j=1}^{3} \exp(\beta' \boldsymbol{x_j})}, \forall \ i \ in \ [1,2,3]$$

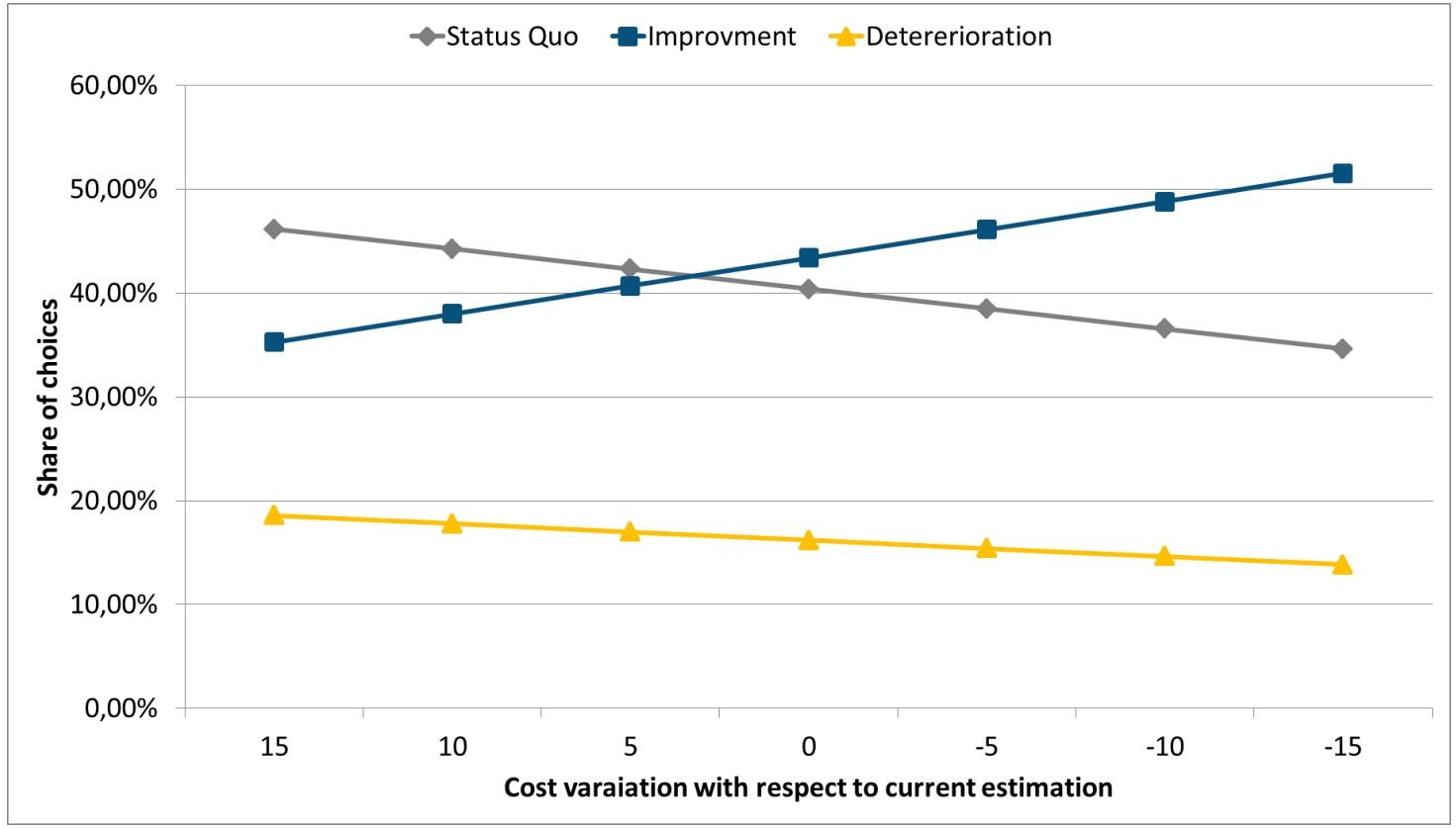
**Δ Cost**

| | Status Quo | Improving | Deterioration |
|---|---|---|---|
| Status Quo | -0,51% | 0,38% | 0,10% |
| Improving | 0,38% | -0,54% | 0,16% |
| Deterioration | 0,10% | 0,16% | -0,29% |

| Satisfaction |
|---|
| 9,50% |
| -7,00% |
| -2,00% |

| Trust |
|---|
| -7,89% |
| 6,20% |
| 1,68% |

# Gradual increase in cost, would increase adhesion rate




**- 10€**

**+5%**
**adhesion rate**

Notice: Assuming linear effects

# Concluding Remarks

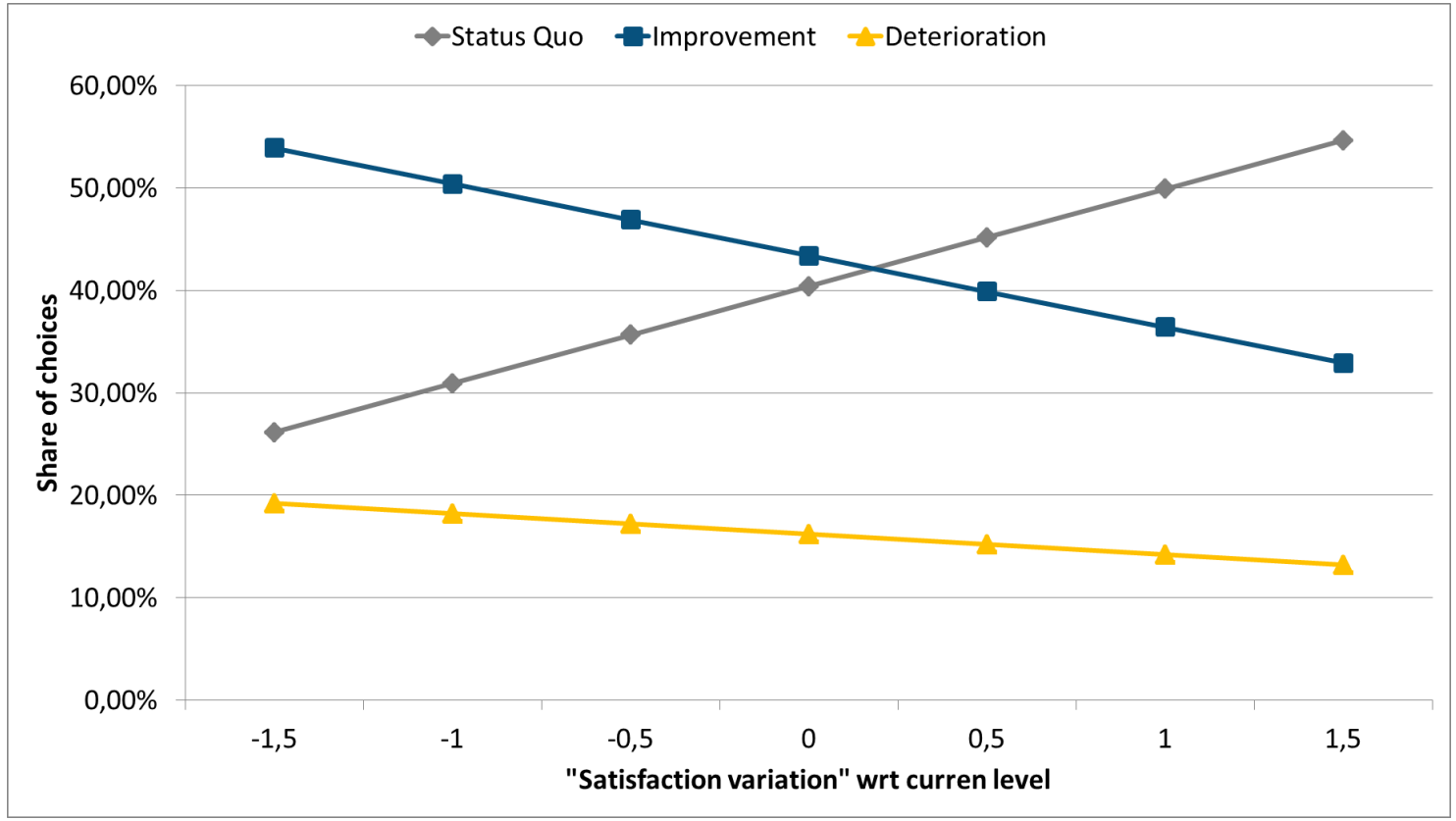
- **Easy, clear and accessible information** helps in understanding the proposed improvement path, and thus it results in an increased acceptance of the water policy plan

- Cost should increase **gradually**, always coming with **information**, so to make citizens aware of the improvement, and finally **increase satisfaction**

- Improvement should be a **"bottom-up"** process: there shall be a grater focus on the most *deficient* regions, trying to match **perceived** and **objective quality**

- Relationship with citizens shall be **put forward,** and be sure that is based on **trust**

# Higher satisfaction calls from a *bottom-up* improvememt

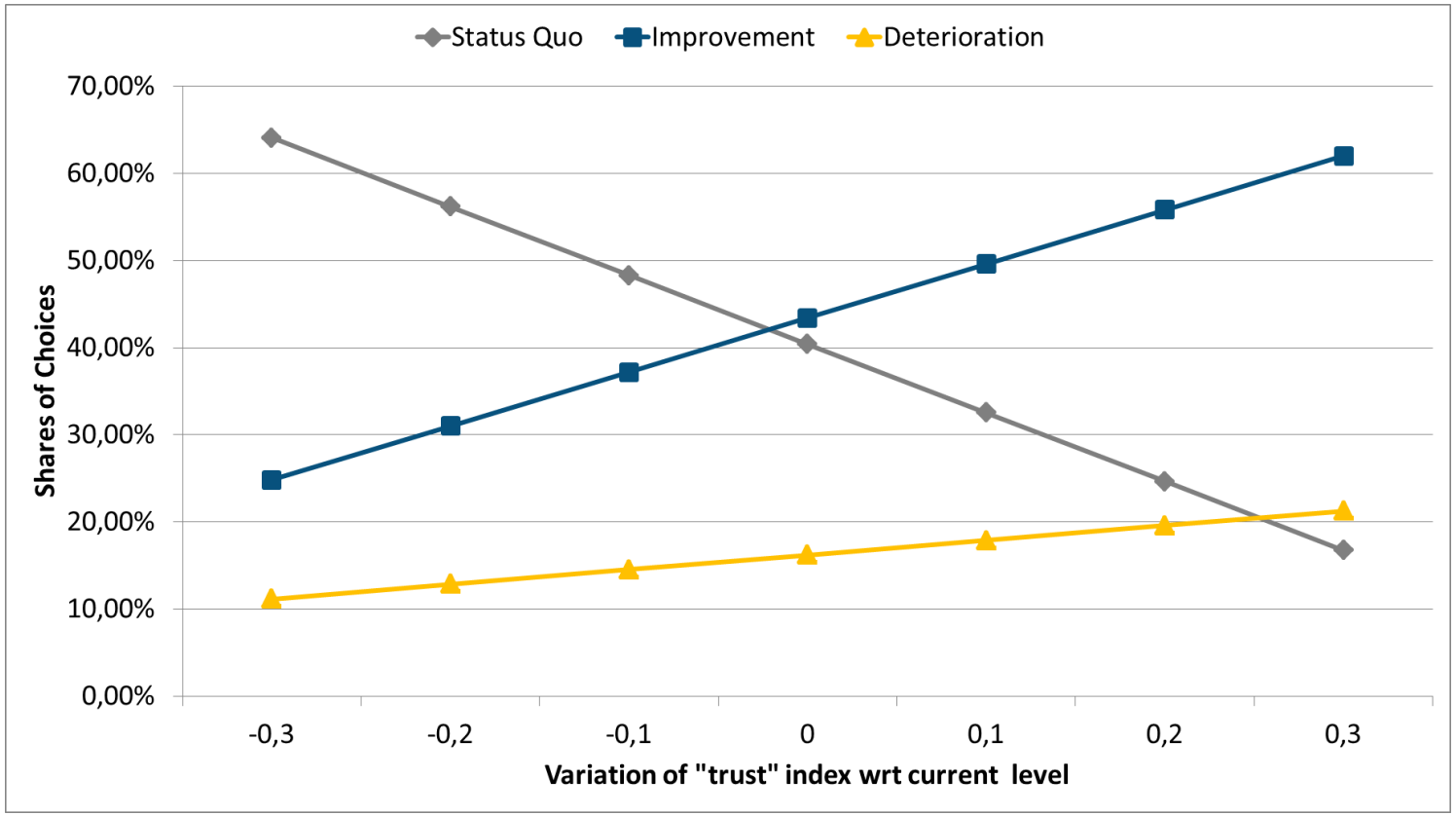



**+ 1 satisfaction**

**-2% "opposers"**

Notice: Assuming linear effects

# Trust as a booster for adhesion rate




**+ 10% Trust**

**+8%**
**adhesion rate**

Notice: Assuming linear effects

# GRAZIE!

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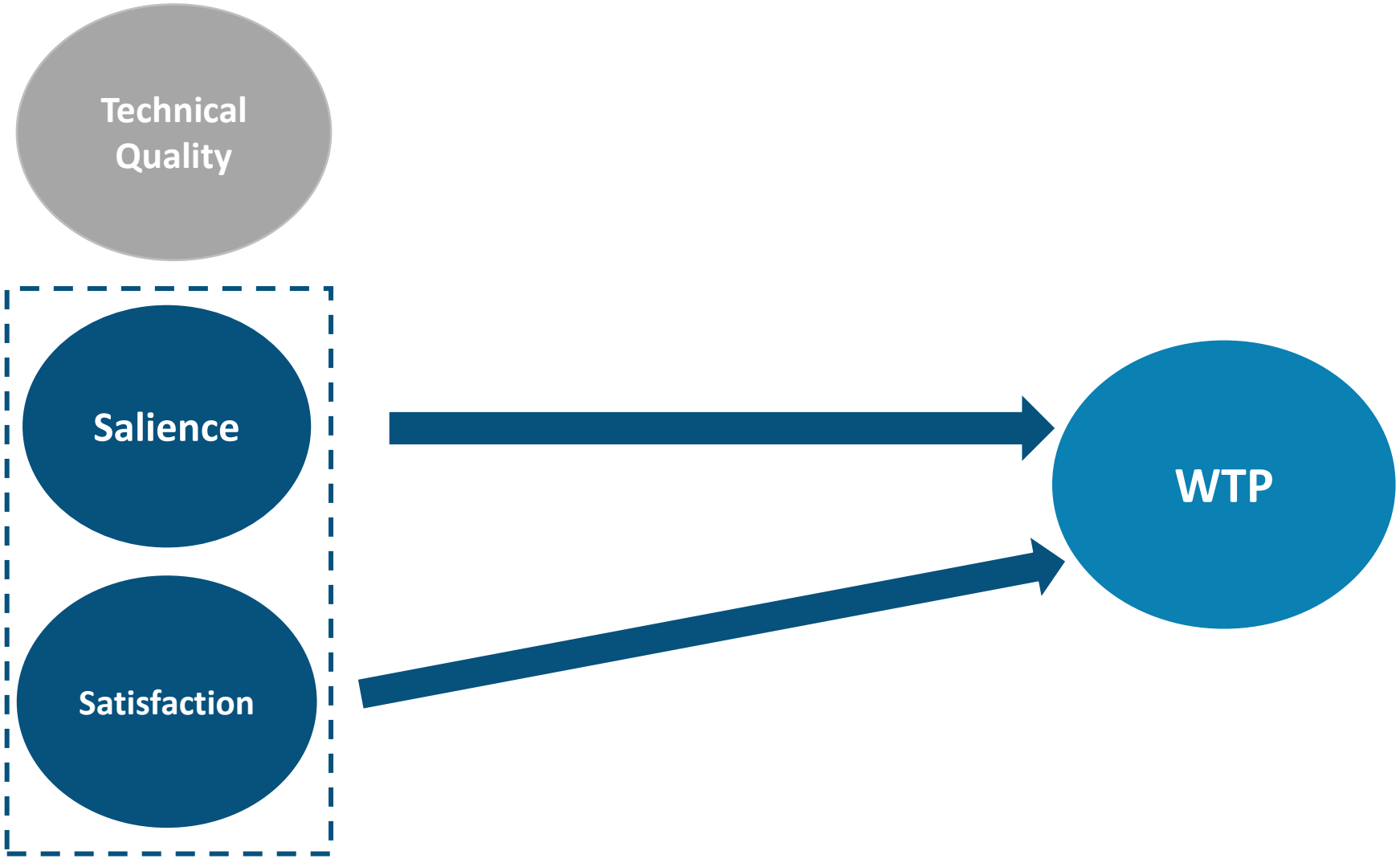
# Supremacy of perception



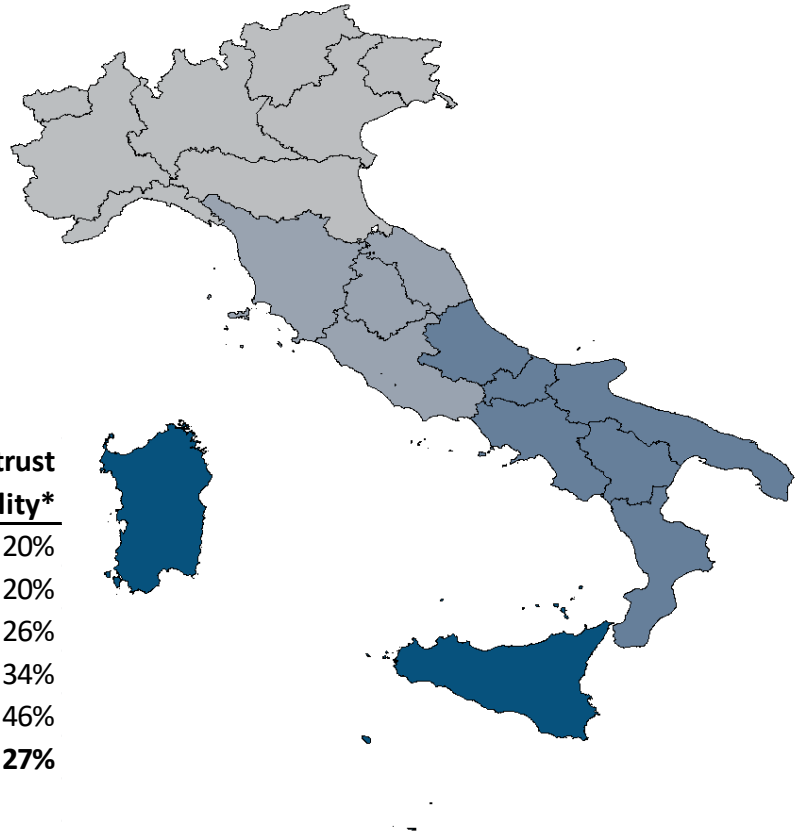

back

# Trust rate: a definition

## Drinking tap water due to trust-issues as a proxy for trust in Water Utility

**Do you drink tap water?**

**No, I don't trust local water utility**



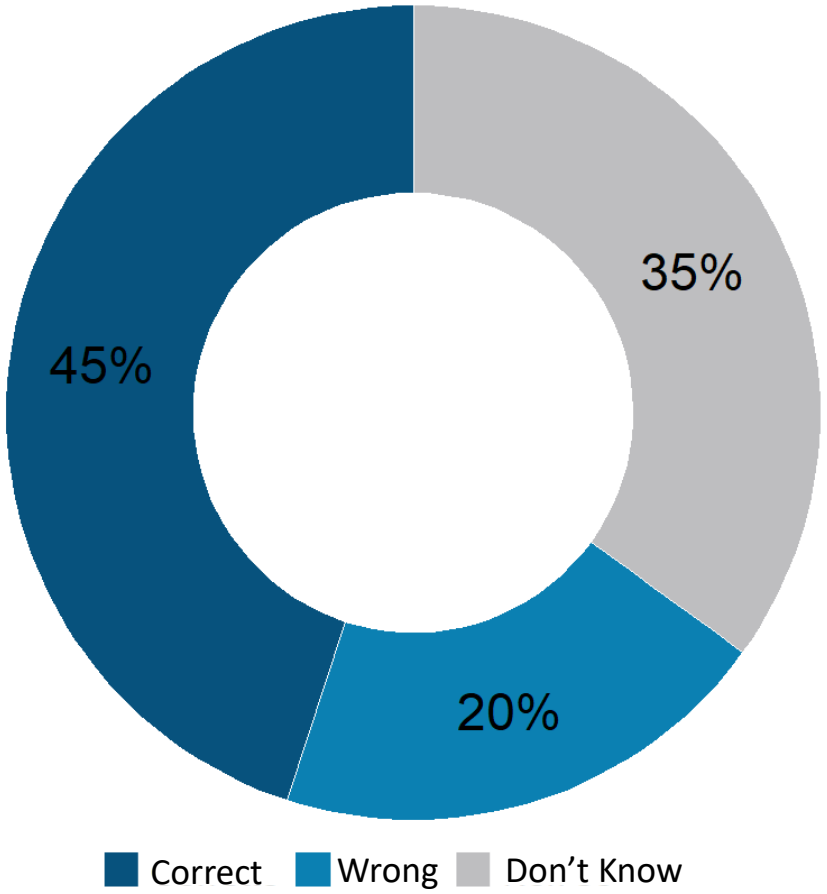
| Area | Do you drink tap water? | No, I don't trust local water utility* |
|---|---|---|
| North West | 54% | 20% |
| North East | 45% | 20% |
| Center | 50% | 26% |
| South | 42% | 34% |
| Islands | 25% | 46% |
| **Mean** | **55%** | **27%** |

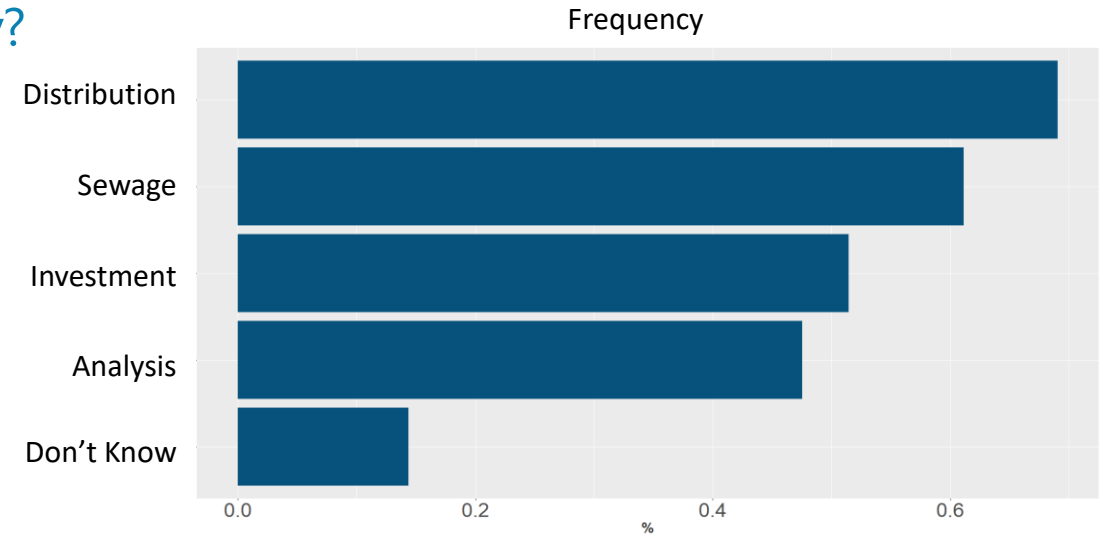
** Anwers "I think tap water is not safe"*
*"Tap water is not analysed"*

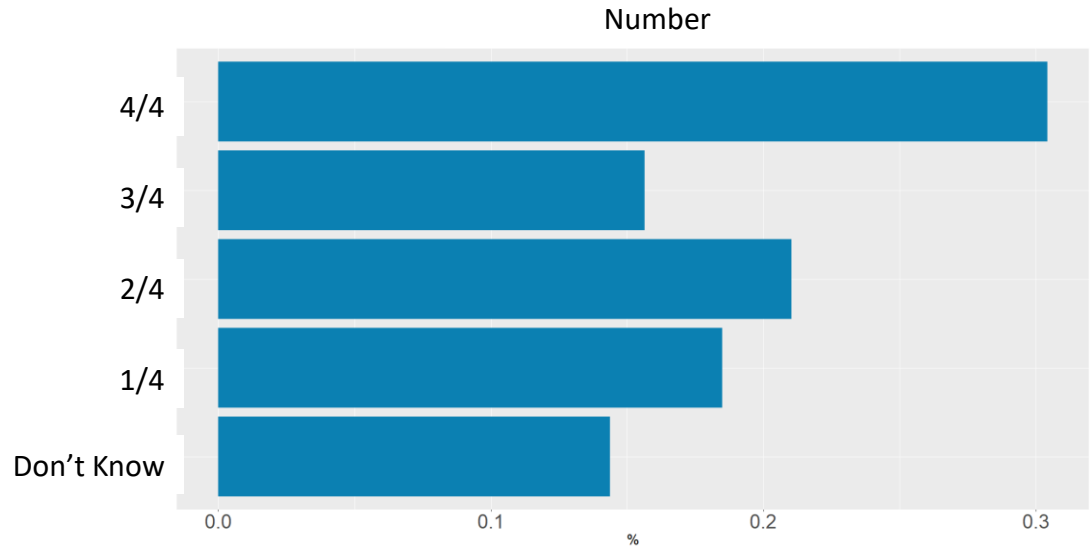
back

# Knowledge of water utility

## What is the name of your local water utility?



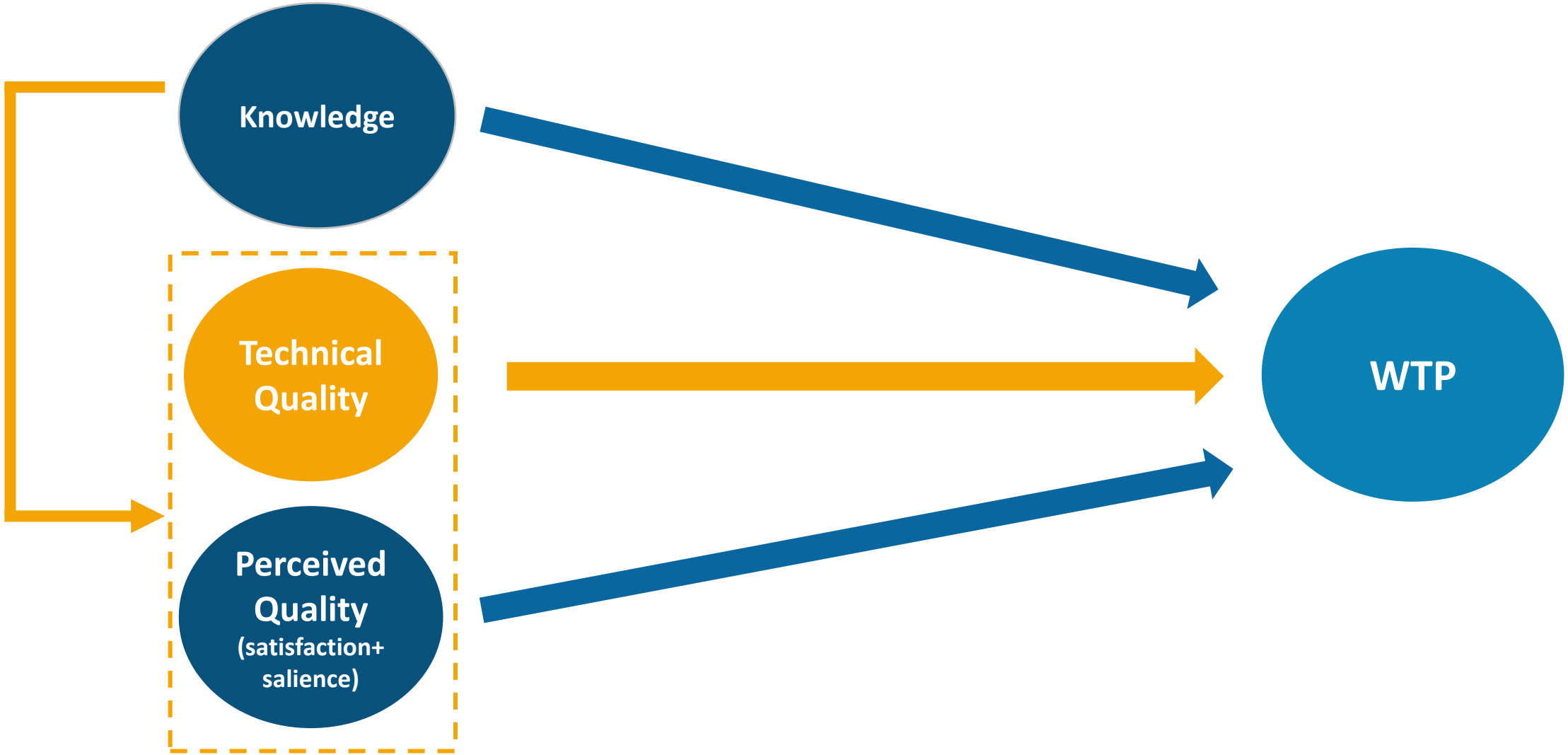




back

# Objective VS Perceived Quality: the role of *knowledge* (1)

Direct and indirect effect




back

# Objective VS Perceived Quality: the role of *knowledge* (2)

## The indirect effect in details

**KNOWLEDGE INDEX = 1 (LOW)**

| | Water loss | Supply interruption | Potability | Sewerage overflows | Depuration |
|---|---|---|---|---|---|
| (intercept) | 2.229*** | 3.225*** | 3.343*** | 2.821*** | 2.925*** |
| Class A | 0.605 . | 0.196 | 0.268 | 0.499* | 0.454* |
| Class B | 0.194 | .0.225 | | 0.379 | 0.375 . |
| Class C | 0.05 | -0.456 | 0.057 | 0.24 | 0.687* |
| Class D | 0.237 | | -0.051 | 0.446 | 0.321* |
| Class E | -0.062 | | -0.057 | 0.253 . | |
| S.P. | | 0.504* | | 1179 | |
| adjusted $R^2$ | 0.004 | 0.02 | -.009 | 0.004 | 0.024 |
| Observations | 293 | 293 | 293 | 293 | 293 |

**KNOWLEDGE INDEX = 2 (MEDIUM)**

| | Water loss | Supply interruption | Potability | Sewerage overflows | Depuration |
|---|---|---|---|---|---|
| (intercept) | 2.278*** | 3.402*** | 3.371*** | 2.769*** | 3.323*** |
| Class A | 0.18 | 0.184 | 0.036 | 0.379 | -0.103 |
| Class B | -0.06 | -0.08 | -0.371 | 0.314 | -.044 |
| Class C | 0.102 | -0.51* | -0.027 | 0.473** | 0.552* |
| Class D | 0.227 | | 0.557** | 0.413 | 0.056 |
| Class E | -0.114 | | 0.166 | 0.199 | |
| S.P. | | 0.342 . | | 1321 | |
| adjusted $R^2$ | -0.001 | 0.023 | 0.011 | 0.007 | 0.008 |
| Observations | 411 | 411 | 411 | 411 | 411 |

**KNOWLEDGE INDEX = 3 (HIGH)**

| | Water loss | Supply interruption | Potability | Sewerage overflows | Depuration |
|---|---|---|---|---|---|
| (intercept) | 1.985*** | 3.4552*** | 3.309*** | 2.792*** | 3.014*** |
| Class A | 0.39 | 0.578*** | 0.636* | 0.513 . | 0.402 . |
| Class B | 0.291 | 0.321 | -0.309 | 0.637 | 0.397 . |
| Class C | -0.1 | -0.234 | 0.52** | 0.254 | 0.843** |
| Class D | -0.07 | | 0.35 | 0.986* | 0.368* |
| Class E | 0.015 | | 0.413* | 0.399* | |
| S.P. | | 0.548*** | | | |
| adjusted $R^2$ | 0.008 | 0.058 | 0.018 | 0.015 | 0.02 |
| Observations | 318 | 318 | 318 | 318 | 318 |

back