

# DIGITAX

## Towards Sustainable Tax Relations A Multidimensional Approach

University of Antwerp, Belgium

21 December 2023

Erich Kirchler

University of Vienna and Institute for Advanced  
Studies, Austria

# Taxes, digitalization and artificial intelligence & psychology

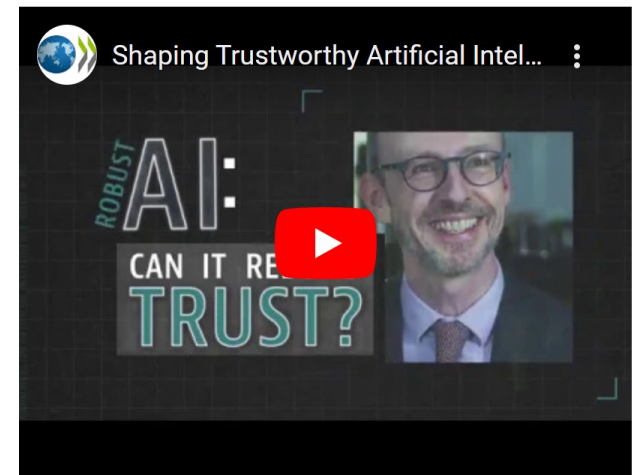
- Society is digitising and digitalising at a rapid pace and tax authorities have to keep up with profound changes in how companies administer their tax liabilities. They must achieve an efficient and effective audit quality regardless of the degree of digitisation and digitalisation implemented by the audited companies (Siglé, M. A., Muehlbacher, S., van der Hel, L. & Kirchler, E. 2023)
- Individual taxpayers and companies must increasingly get used to digital governmental services and often exclusively use electronic services (e.g., anecdotal experience with billing ministries for services)
- Tax administrations plan selecting audit cases and audits using artificial intelligence. According to the OECD, AI should determine who should be subject to audits and audits should be carried out almost fully automated.
- Artificial intelligence (AI) is transforming every aspect of our lives. It influences how we work and play. It promises to help solve global challenges like climate change and access to quality medical care. Yet AI also brings real challenges for governments and citizens alike... While AI offers tremendous benefits, some of its uses produce dangerous results that can harm individuals, businesses and societies. These negative outcomes, captured under the umbrella term “AI incidents”, are diverse in nature and happen across sectors and industries (OECD; <https://www.oecd.org/digital/artificial-intelligence/> retrieved December 2023)

# — Artificial Intelligence: **OECD Principles**

## How governments and other actors can shape a human-centric approach to trustworthy AI

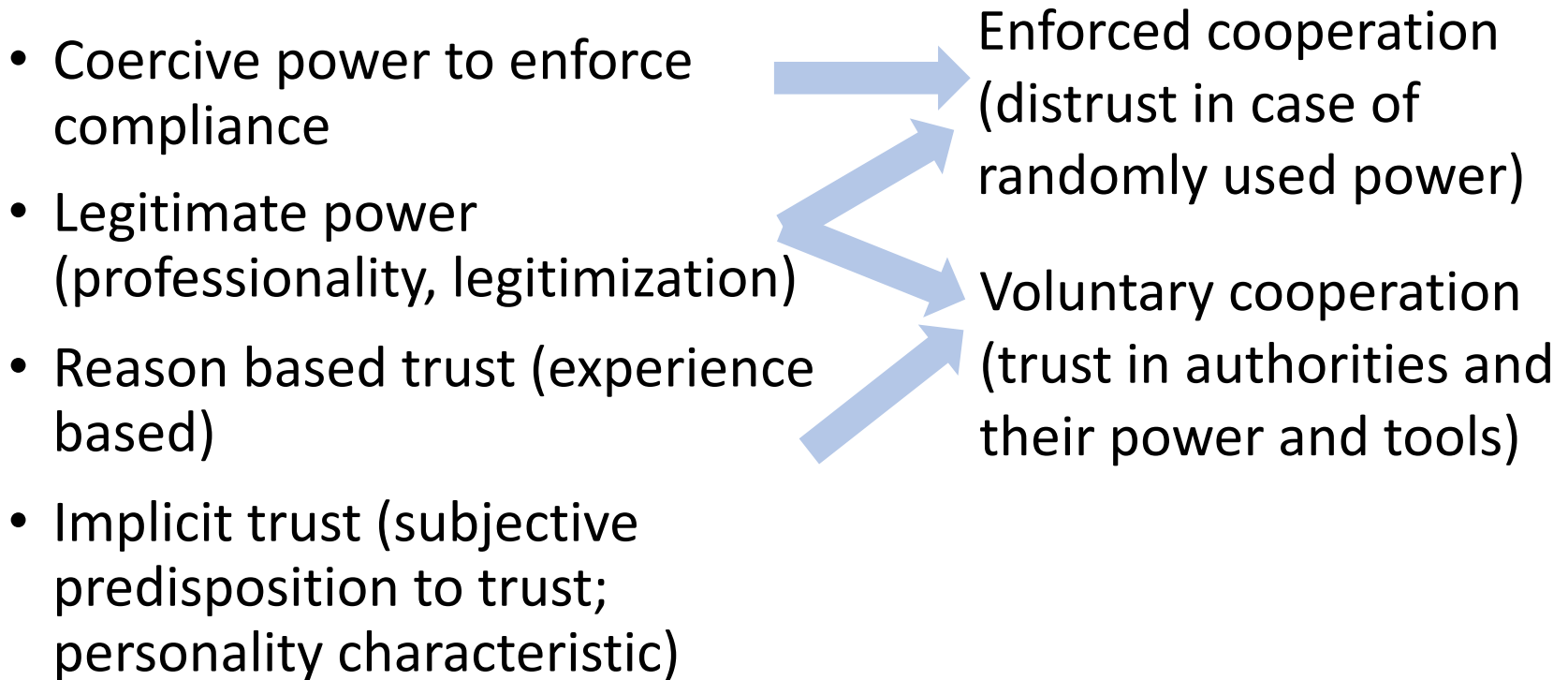
The OECD Principles on Artificial Intelligence promote AI that is innovative and trustworthy and that respects human rights and democratic values. They were adopted in May 2019 by OECD member countries when they approved the **OECD Council Recommendation on Artificial Intelligence**.

The OECD AI Principles are the first such principles signed up to by governments. They include concrete recommendations for public policy and strategy, and their general scope ensures they can be applied to AI developments around the world.

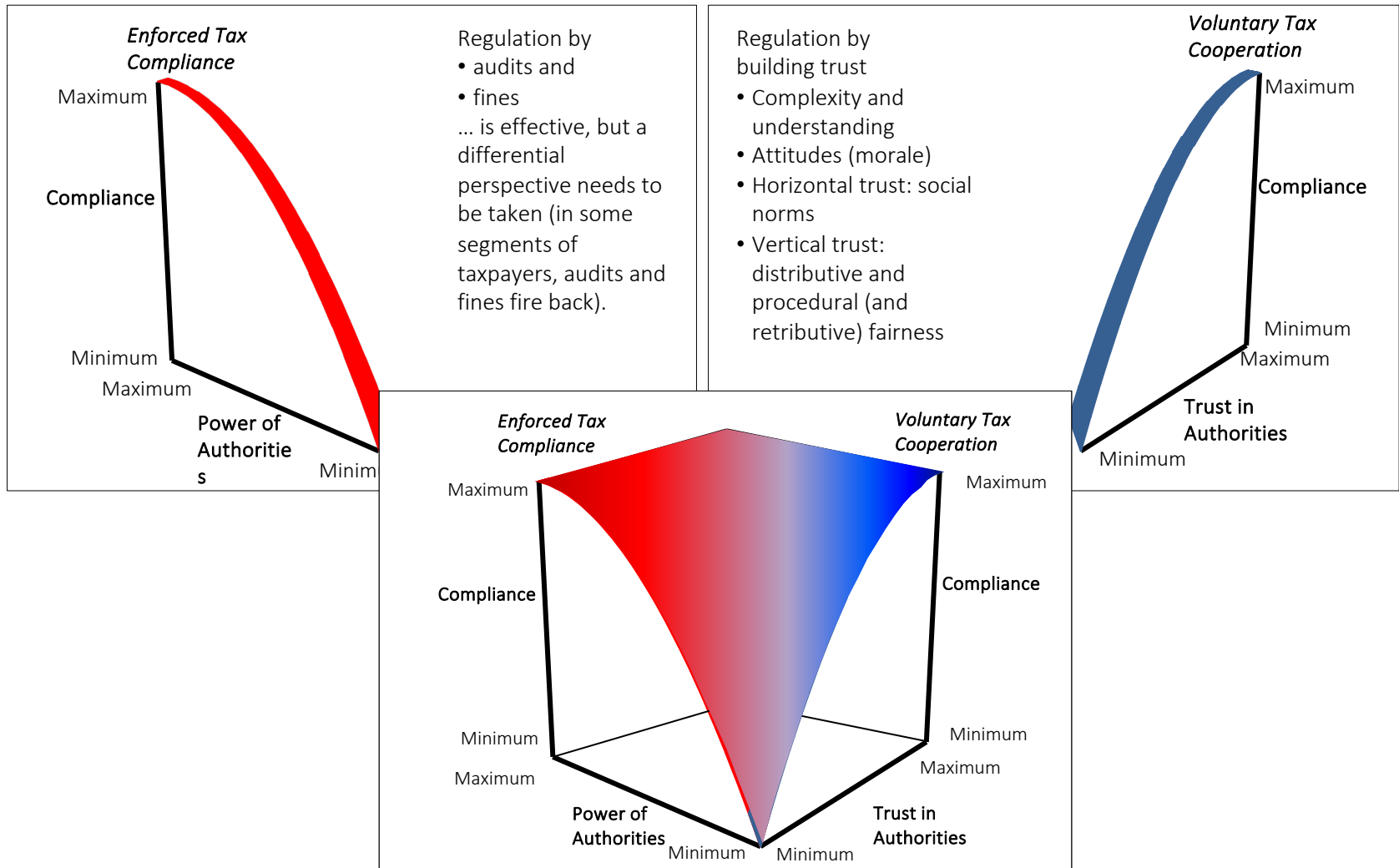


Crucial aspects are trust in AI and perceived fairness of input-data analyzed by AI, algorithms and outcome

# General framework: eSSF



# General Framework: Slippery Slope Framework



# Trust in Institutions

Mayer et al.'s (1995) trust model: ability, benevolence, integrity are characteristics of trustworthy individuals.

## Institutions

1. Competence (knowledge and the ability to communicate knowledge = legitimate and expertise power)
2. Integrity (authenticity; honest/thorough consultancy)
3. Transparency (concerning rules, procedures)
4. Benevolence (giving advice and communicating; willingness to take the client's perspective)
5. Value congruence (of important values and norms)
6. Stability (predictability)
7. Reputation (positive trustworthy image)

Determinants for trust in financial institutions (Gärling, Kirchler, Lewis, & van Raaij, 2010)

# Trust in the SSF

- Complexity and understanding
- Attitudes
- Horizontal trust: social norms
- Vertical trust (justice, fairness):
  - distributive: non-discriminatory allocation of resources based on equity, equality, need principles
  - Procedural (fair criteria, e.g., revocability or consistency)
    - Informational (transparency)
    - Interpersonal (respecting protected data and privacy rights)
    - Retributive (fair sanctions and fines)

(Starke, Baleis, Keller & Marcinkowski, 2022. Fairness perceptions of algorithmic decision-making: A systematic review of empirical literature. *Big Data & Society*, 1-16.)

# Selection of audit cases (correspondence) audits

## Human vs automated decisions

- Expertise and intuition (holistic information processing)
- Attention to special cases
- Limited kognitive capabilities
- Social stereotpyes
- Prejudices
- Analytical, algorithm based
- Reduction of human bias: consistency and bias supression by no-emotions
- Depending on data, algorithms lead to poor outcomes
- No holistic processing and attention to special cases



# Acceptance and perception of fairness by citizens and administrators

- Fairness has become a key element in developing algorithmic systems (? Input, process or output feature)
- Trustworthiness of AI depends strongly on perceived algorithmic fairness (= decisions are not producing unjust, discriminatory or disparate consequences)
- Trust increases perceived fairness which fuels satisfaction
- Thus: society-in-the-loop approach is necessary (consideration of social and societal questions)

# Fairness in the literature

Starke et al. (2022): no consensus in the literature (58 studies) on a precise definition of (un)fairness and measurement; and fairness perceptions are highly context dependent.

Impact of transparency and explanations on perceived fairness is mixed (depending on gender, age, education, context; interestingly: ... while participating in a workshop about ethical AI raised awareness about algorithmic fairness, understanding the mathematical definition of the fairness concept led respondents to reject the fairness concept. AI literacy seems to be associated with lower levels of perceived algorithmic fairness; p. 7-8).

Belief AI makes fairer decisions than humans = approx. 50%.

# Anouk Decuypere & Anne Van de Vijver (work in progress): AI: Friend or Foe of Fairness from the Tax Administration?

- The authors investigate citizens' procedural fairness perceptions of tax administration's use of artificial intelligence
- 2 scenario-survey-studies in which they test perceptions and evaluation of selection of cases for tax audits, either predominantly by a human or AI (proportion varies from 20:80, over 50:50 to 80:20)
- and whether presence of absence of transparency and
- explanations of transparency matter.

Decuyperre & Van de Vijver

Figure 3. The main effect of the “proportion” vignette scenario on perceived bias suppression and consistency in Study 2.

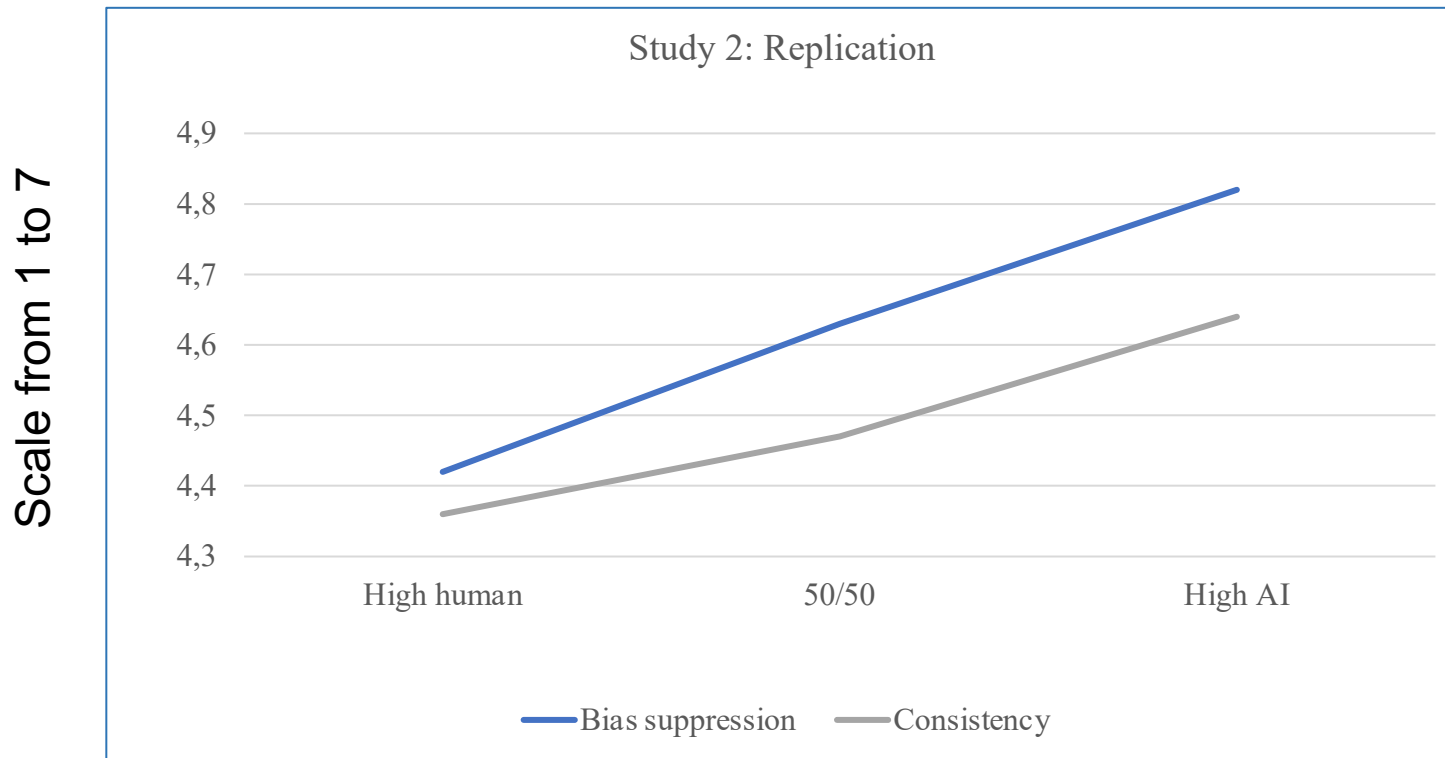


Figure 3. The scores are unstandardized on a seven-point Likert scale from 1 (“Completely disagree”) to 7 (“Completely agree”), 4 = “Neutral”. Students and professionals score significantly differently. All three group scores are significantly different, except the difference for consistency scores between the 50/50 and high human conditions.

Decuyperre & Van de Vijver

Figure 4. The interaction effect of “proportion of selection by AI” and trust in the tax administration on bias suppression in Study 2.

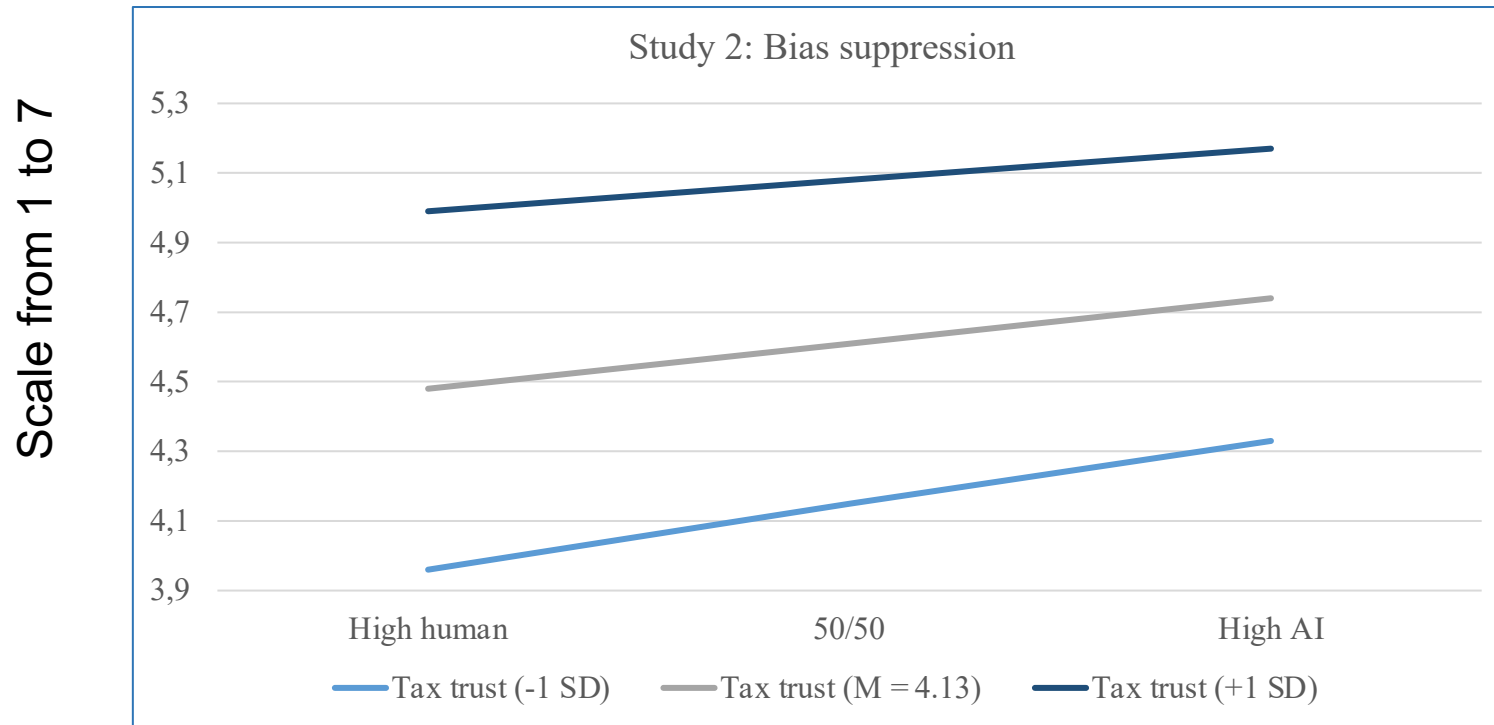


Figure 4. The scores are unstandardized on a seven-point Likert scale from 1 (“Completely disagree”) to 7 (“Completely agree”), 4 = “Neutral”. The differences between all the slopes are statistically significant. The means for trust in the tax administration were as follows: -1 SD = 3.02, M = 4.13, +1 SD = 5.24

Decuyper & Van de Vijver

Figure 5. The interaction effect of “proportion of selection by AI” and trust in the tax administration on consistency in Study 2.

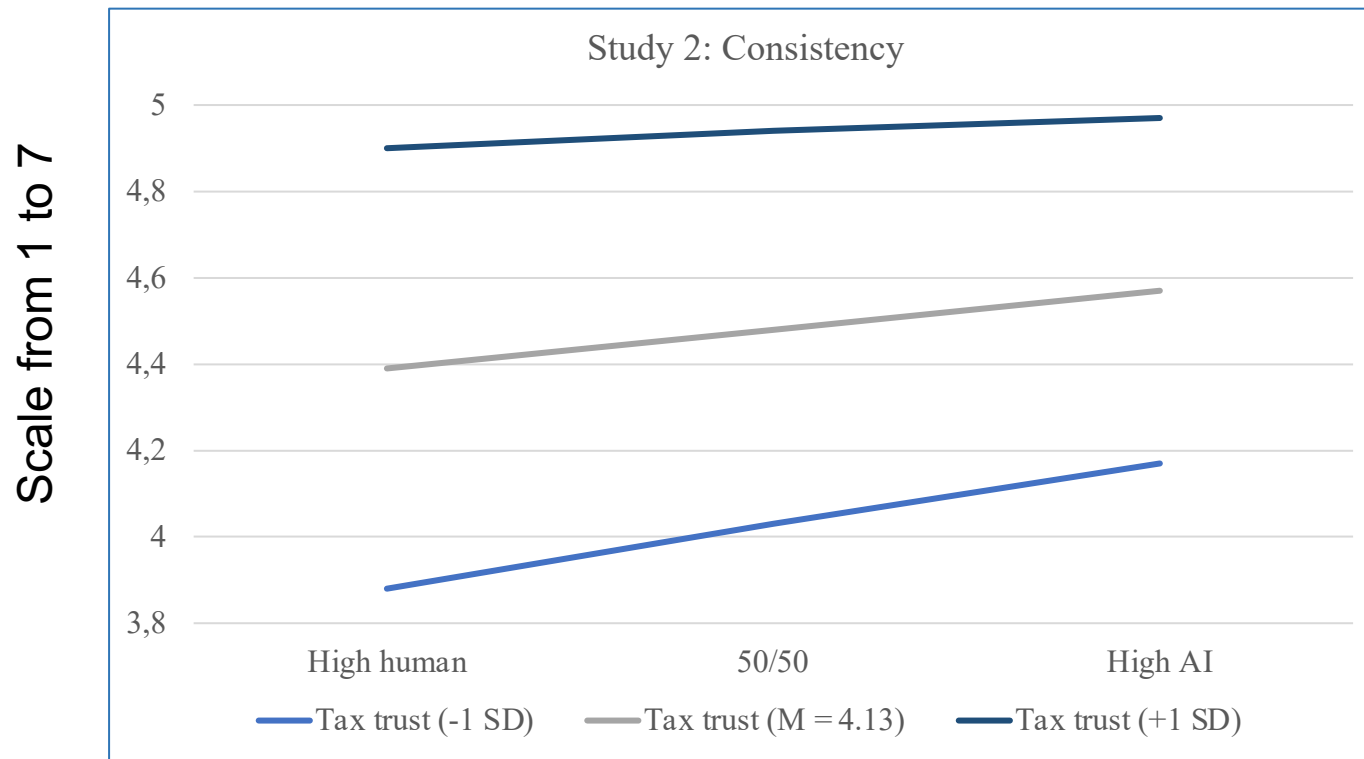


Figure 5. The scores are unstandardized on a seven-point Likert scale from 1 (“Completely disagree”) to 7 (“Completely agree”), 4 = “Neutral”. The differences between all the slopes are statistically significant. The means for trust in the tax administration were as follows: -1 SD = 3.02, (M = 4.13, +1 SD = 5.24)

# Decuyper & Van de Vijver: Hypotheses and results

Higher AI by the tax administration is perceived as more fair in general.



Higher AI by the tax administration is perceived as more procedurally fair.



Fairness propensity moderates the impact of AI use on procedural fairness, in such a way that higher fairness propensity yields higher procedural fairness scores as AI use goes up.



Transparency on the data used for AI is perceived as more (procedurally) fair.



Explanations for the reasoning (on the presence or absence of transparency) is perceived as more (procedurally) fair.



The combination of both transparency and an explanation is perceived as more (procedurally) fair than transparency alone.



Ideal percentage of selection by AI is higher than 50% (and higher than that of civil servants) – in line with Hypothesis 1.

