Federal Ministry
Republic of Austria
Finance

USE OF BENFORD'S LAW IN THE CASE SELECTION OF EX-POST CLEARANCE CUSTOMS AUDITS IN AUSTRIA

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(c) http://www.garagezero.eu/20170805193813_gartner-quadrant-big-data/

Aim of cooperation of JRC with Austria's customs administration

Fraud by undervaluation: Importers declare fake and too low values

Benefit for Austria's customs administration:

• Additional risk indicator for case selection of ex-post clearance customs audits

Benefit for the JRC:

• Data from AT for research purposes

• Feedback from real cases

$\Rightarrow$ Improvement of algorithm
$\Rightarrow$ Improvement of case selection

Customs data for Benford Analyses

- 10 M import items

- 40,000 companies

- 7,000 different type of goods

- Period: 2011 – 2018

- Filters:

  - Only items with duty rate > 0 %

  - Only items with duties calculated based on the value

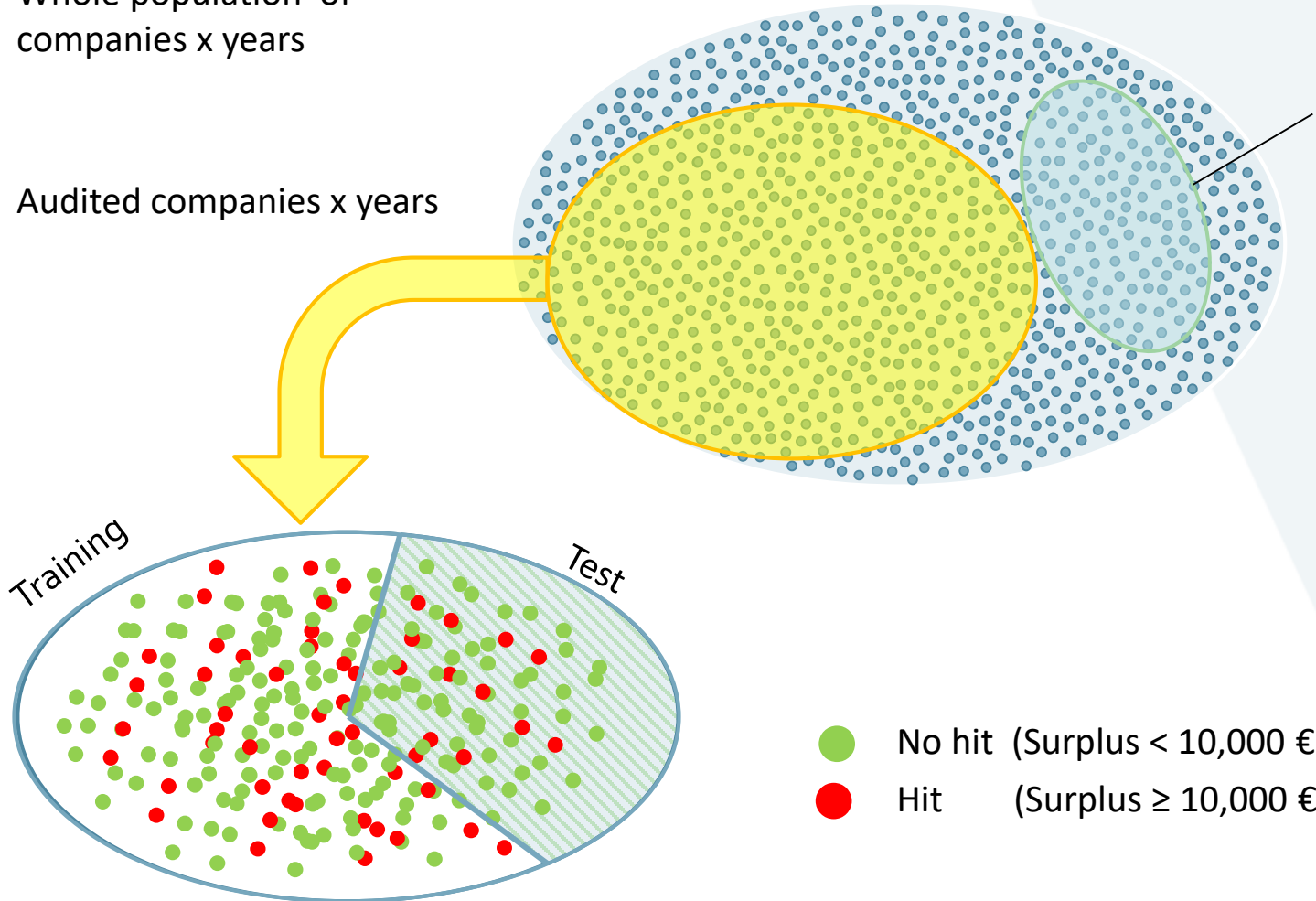 - No declarations for which it is known that the declared mass is wrong

Relevant part for undervaluation fraud

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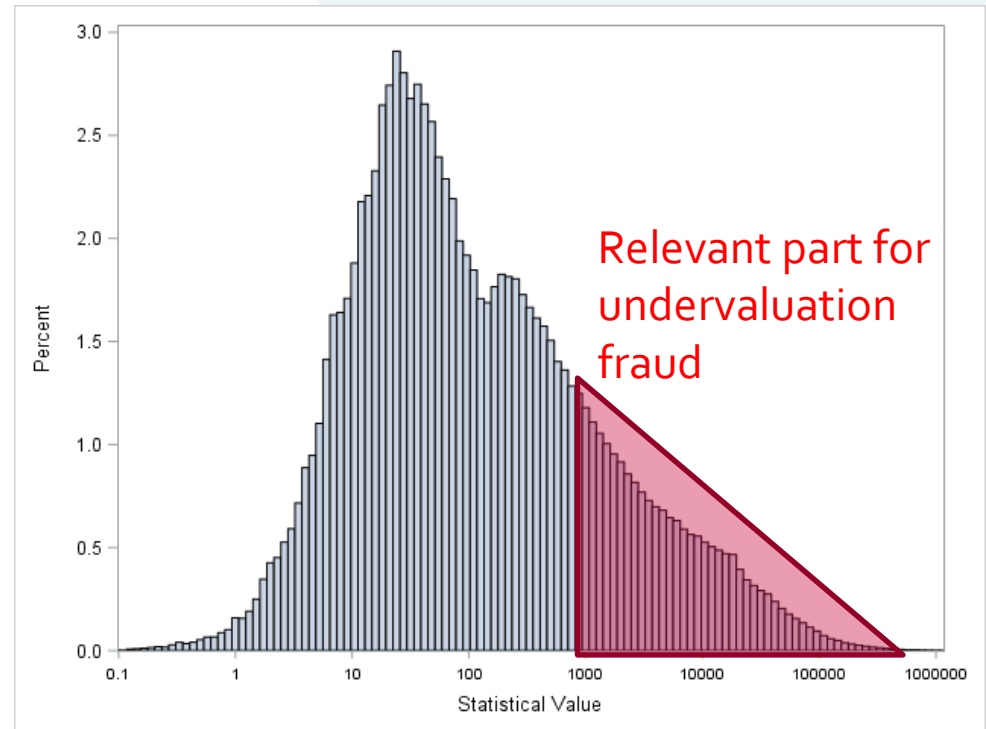
Analytical Approach – Supervised Learning
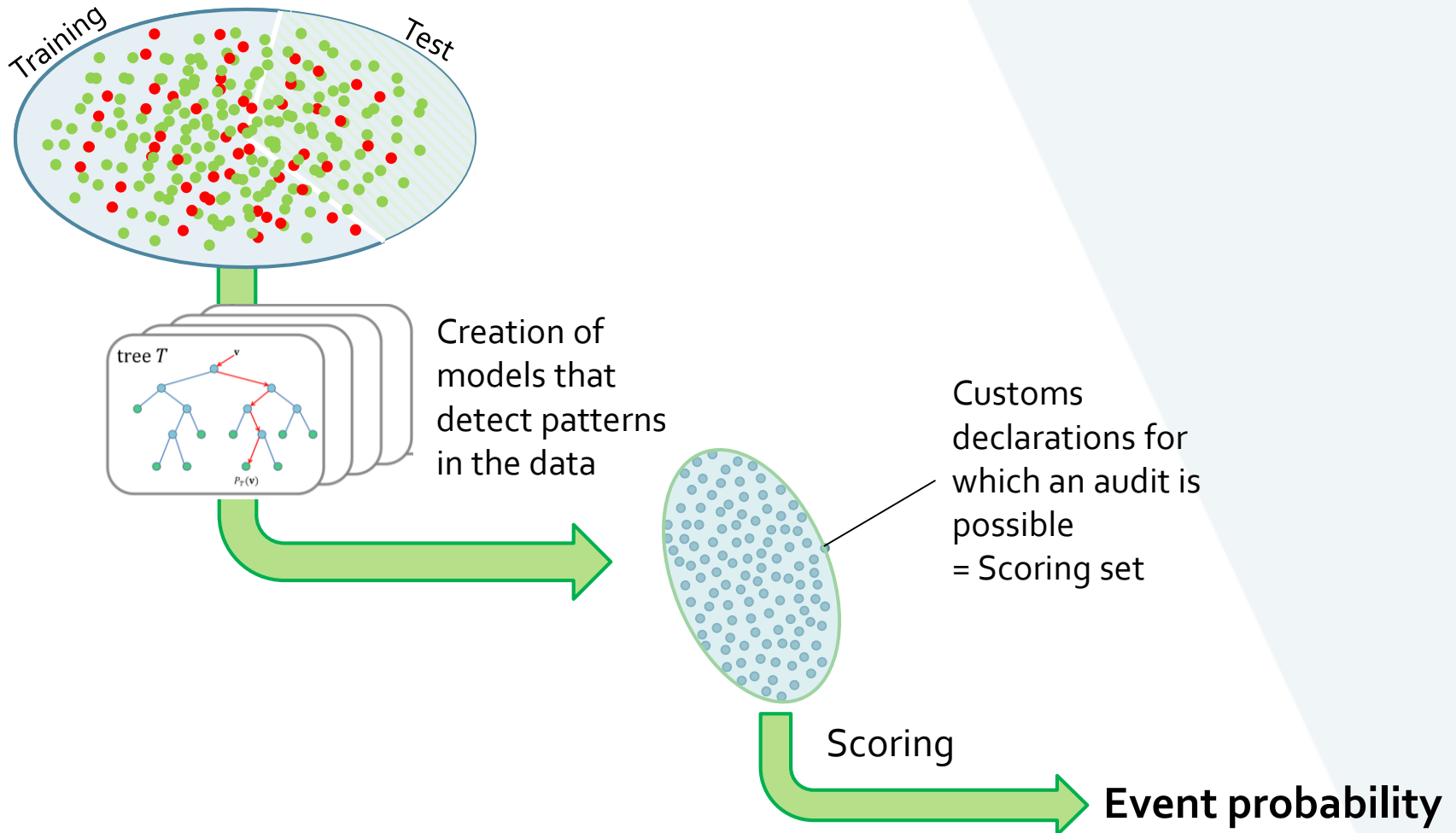
Whole population of
companies x years

Audited companies x years

Companies x years
for which an audit
is possible
= Scoring set

Training

Test

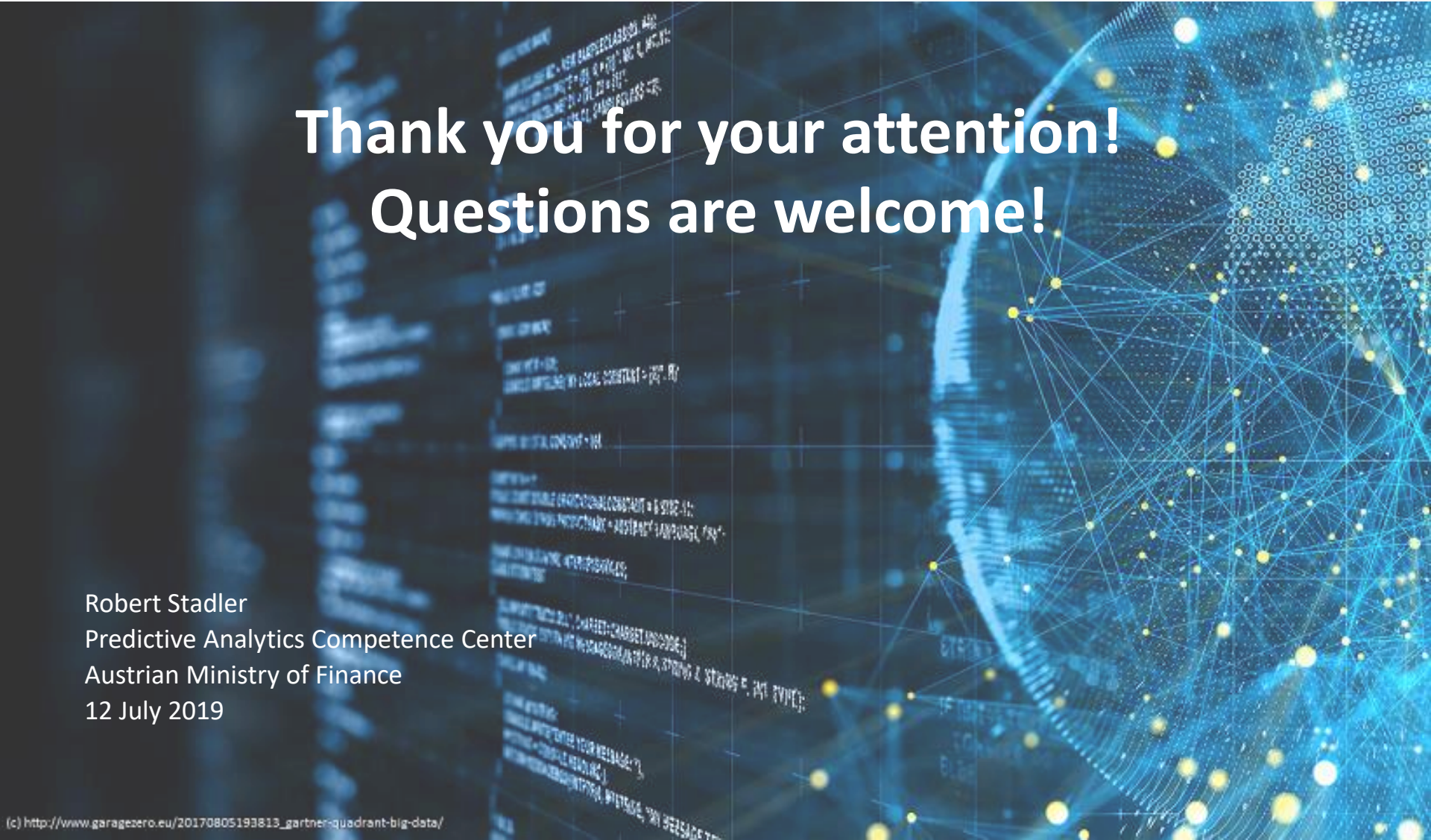● No hit (Surplus < 10,000 €)

● Hit (Surplus ≥ 10,000 €)

Analytical Approach – Supervised Learning

Creation of models that detect patterns in the data

Customs declarations for which an audit is possible = Scoring set

Scoring

Event probability

Data (incomplete)

- For Top5 of imported goods:
  - Type of goods, statistical value
  - Variation in price per kg, variation in mass per unit
  - Calculated gaps of statistical value using JRC's Monthly Fair Price and Estimated Fair Price
  - Routes of transports, means of transports
- Tax advance return: (calculated) profit, turnover, …
- Results of past audits (customs, wage tax, income tax, VAT, …)
- Network information: Risky dispatcher, carriers, directors, shareholders
- Basic data: industry, age and legal form, number of employees
- **Benford test results from the JRC**

500 relevant input variables

Thank you for your attention!
Questions are welcome!

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