Automated Risk Detection at Scale: How Sweden's Tax Agency Uses AI to Target High-Risk Deductions

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# 🚗 Sweden's Most Popular Tax Deduction

800,000 taxpayers *claim a commuting* *deduction each year. But nearly* **50% of those** **claims are incorrect**

- **No documentation is required when filing the tax return**

- Documentation is only requested **if selected for audit**

- **Few consequences** even for incorrect claims

- **Random audits** reveal widespread misuse

- Estimated **tax gap: 2.4 billion SEK per year**

📊 *A high-volume deduction built on trust — but vulnerable to abuse.*

Skatteverket
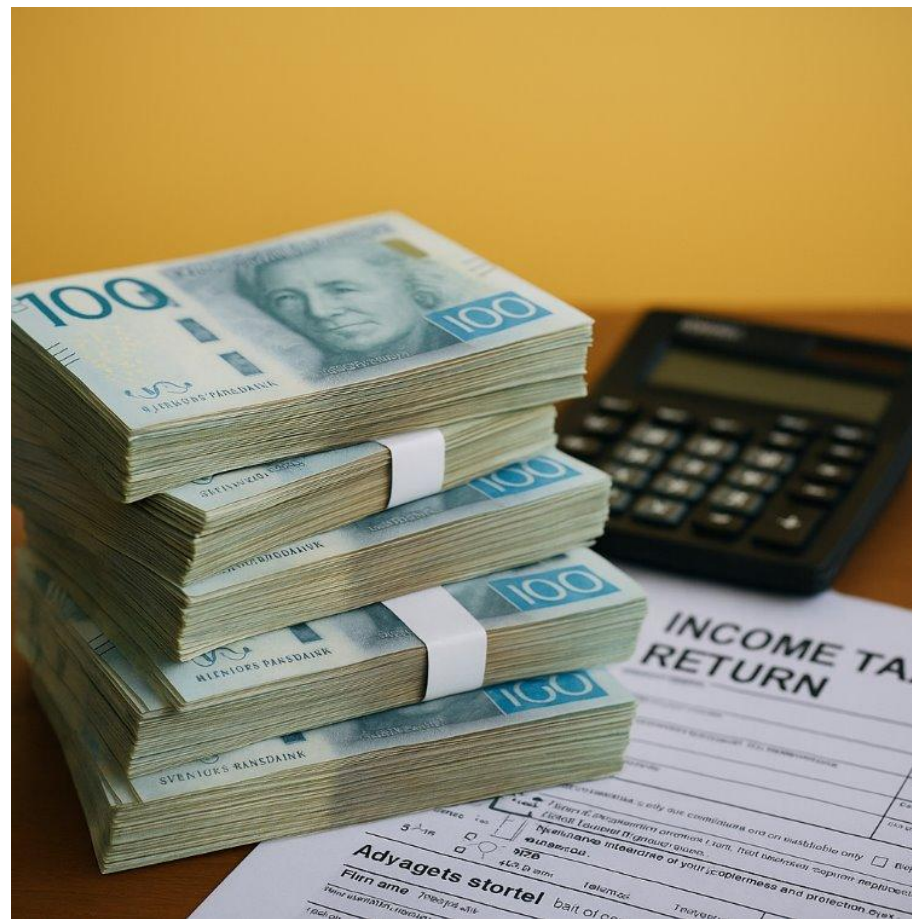
⚠️ Penalty Risk: Low for Incorrect Claims

If you claim a deduction you're unsure about, responding to the Tax Agency may increase your risk of a penalty:

> *"In most cases, staying silent works in your favor"*
> *- Robert Selvaag, Tax Expert on TV4*

Without response, the deduction is usually denied. But if you reply and admit the claim was wrong, you risk a 40% tax penalty – even if your error was unintentional.
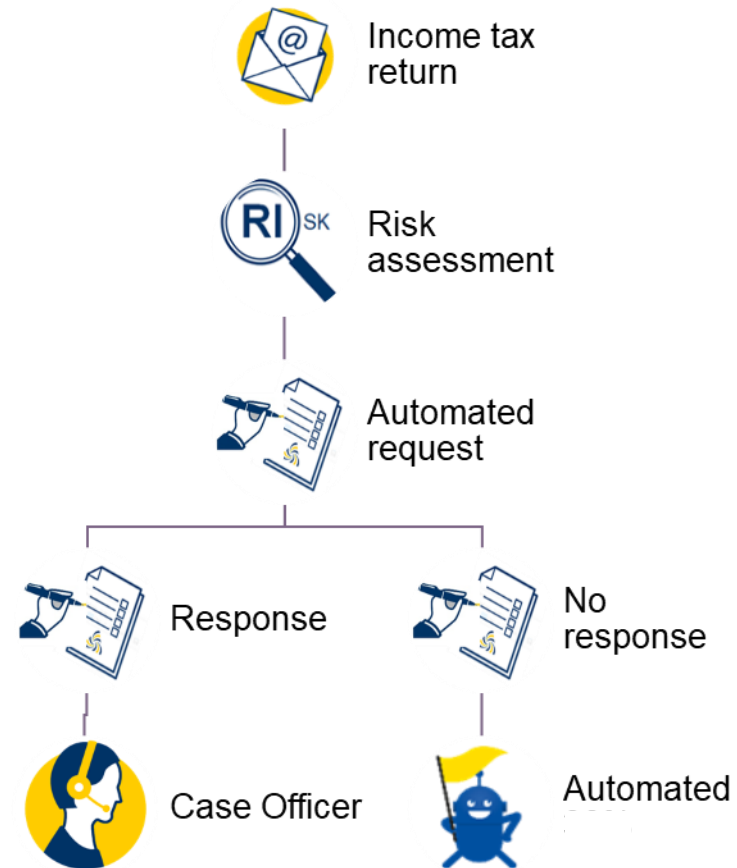
Swedish law places the burden on the Tax Agency. A response can count as strong evidence of wrongdoing

🗣️ *"The system makes it easier to deny a deduction than to prove it was fraudulent."*

Skatteverket

🔍 Two-Part Solution: AI + Automation

- **AI model identifies high-risk claims** for audit

- **Automatic requests** for documentation are sent

- **No response → automatic denial** of the deduction

- **If response → manual review** by case officer

- Reduces manual workload and targets likely errors

Income tax return

RIsk assessment

Automated request

Response

No response

Case Officer

Automated

Skatteverket

How did we do it?

- Selection of **predictive features** (information known prior to audit)

- Declared total income

- Size of claimed deduction

- Location of workplace/home of claimant

- Historic income and deduction

- Other information of predictive value…

- Collection of data on **results of historical audits** (prediction target)

- Deduction claim invalidated or sustained

Training the AI-model

- Model is served the predictive features and observed audit-outcomes of collected historical cases

- Model learns which patterns in the predictive features that corresponds to high risk of an audit resulting in an invalidated claim

- Model trained using XGBoost

Applying the model

- Model is served the predictive features of all current cases, and assigns a risk level to each case

- Cases assigned the highest risk level are selected for audit

Skatteverket
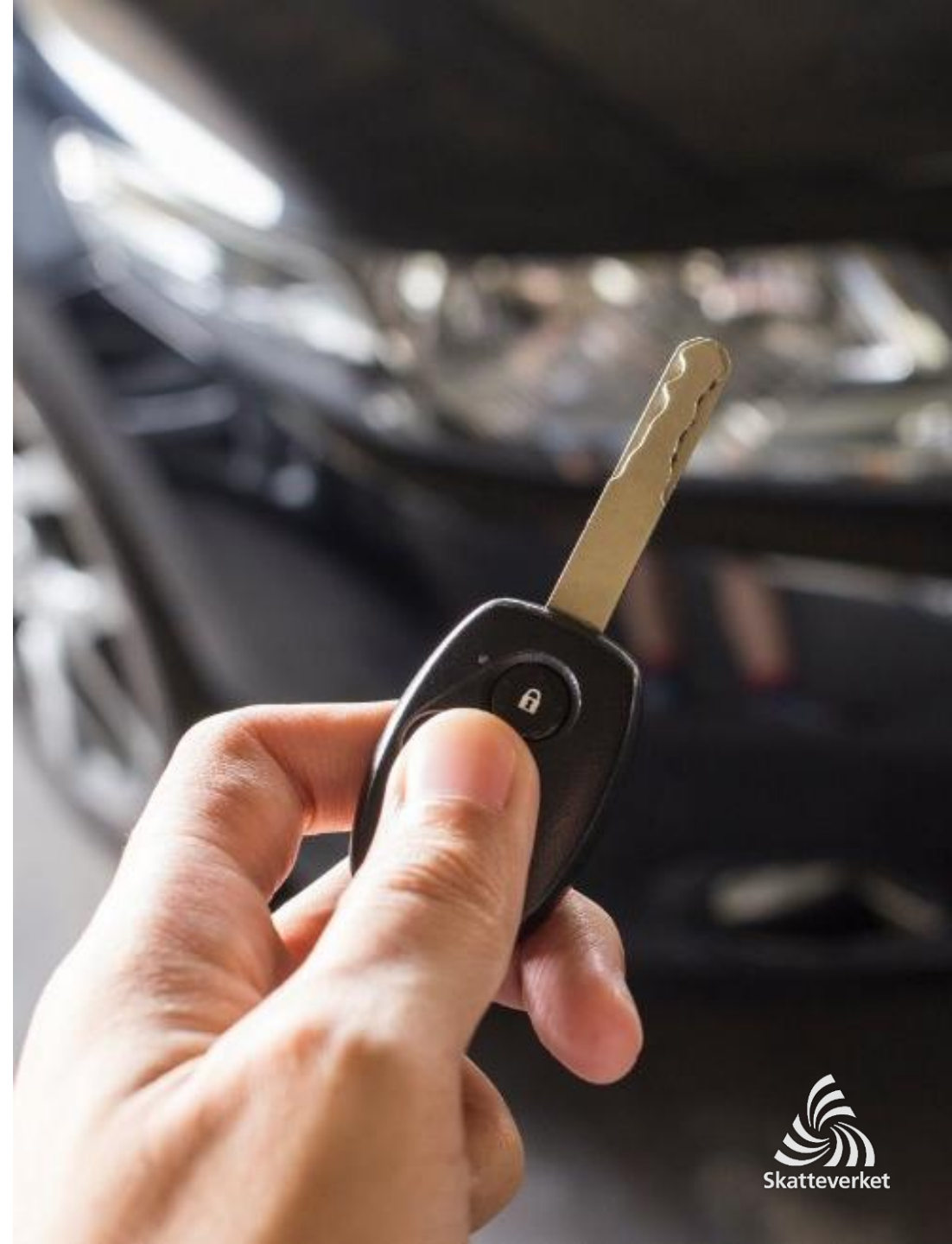
🧭 Ethical Considerations & Mitigations

✅ **Fairness-focused desig**n
→ Targets risk of non-response to reduce incorrect deductions — not who the person is.

🚫 **Sensitive features excluded**
→ Age, gender, and postcode not used in training or selection, only in evaluation.

⚠️ **Bias risk led to action**
→ Committee raised concern about overrepresentation; model simplified to include only directly risk-related features.

🎯 **Random sampling for balance**
→ 10% of selections are random to improve representativity and detect unintended group effects.

👤 **Ongoing governance**
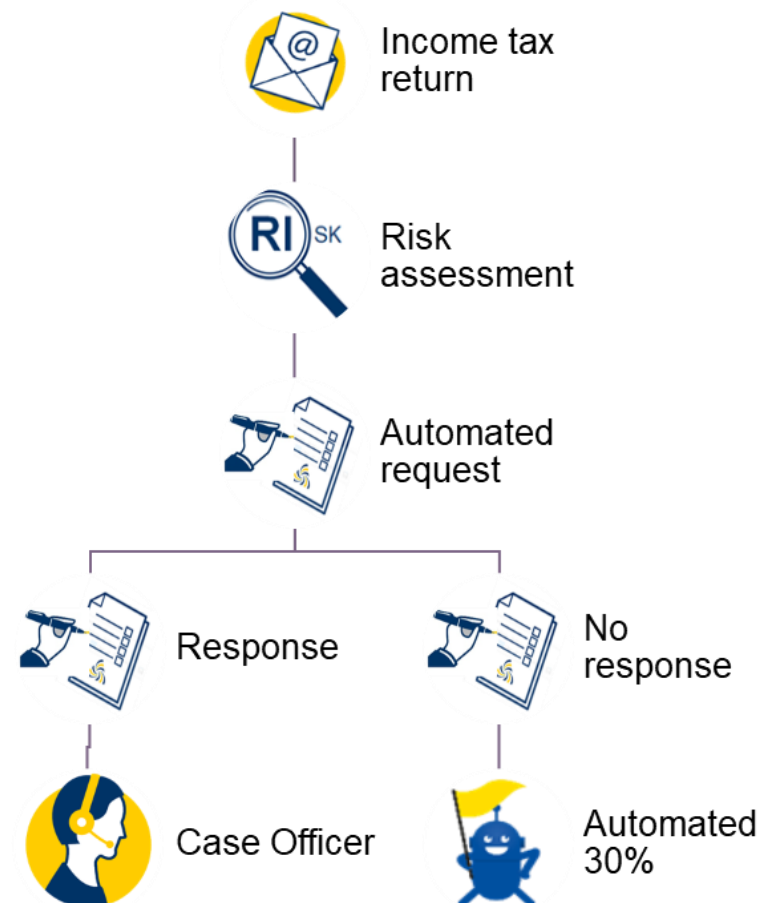→ Ethical oversight assigned; transparency and proportionality emphasised by the Council for Sustainable AI.

📈 Results & Learnings

- **+19,000 additional audits** enabled through automation

- 80% of deductions selected by AI model are **invalidated** after audit (vs. 50% when selecting random cases)

- 30% of selected cases processed with automation only (vs 14% when selecting random cases)

- **300 million SEK** in deductions denied first year (≈42 million in taxes)

- **Non-response → automatic denial**

- **Response → manual review**

- **AI + automation = multiplicative effect → More audits with the same resources**

Income tax return

Risk assessment

Automated request

Response

No response

Case Officer

Automated 30%

💡 Control + Nudging: A Powerful Combination

"Five out of six claims were denied or adjusted"

The Swedish Tax Agency has tightened its control of commuting deductions after uncovering incorrect claims worth **SEK 665 million** during 2022–2023.

- A **new automated method** now targets declarations with the **highest risk of error**

- The selection method is **highly accurate** – **80%** of selected cases were incorrect

- Audits also have a **deterrent effect** – fewer people claim deductions the year after being audited

🗣 *"We focus on declarations where the risk of error is high. And we clearly see behavioural effects in the following year."*

— Åsa Ekström, National Coordinator, Swedish Tax Agency

From Carup.se a Swedish website for car news and reviews.

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