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15th Annual IRS/TPC Joint Research Conference on Tax Administration

Housekeeping

- The event is being recorded, and the recording will be posted online afterwards.
- The slides and abstracts are available online.
- Virtual audience can type questions into the Q&A form at any time
- In-person attendees can use the QR code to submit questions.



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AI-Enabled Tax Assistance for Low/Moderate Income Taxpayers: An Evaluation of RAG-based LLMs for VITA Volunteer Support

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The VITA Program



- **An IRS-Sponsored Program**
- **Serving Key Communities**
- **Powered by Certified Volunteers**
- **Delivering Billions in Impact**

Supporting VITA Volunteers in a Complex Tax World

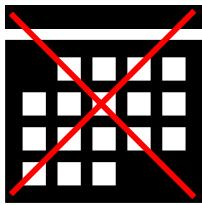


- **Critical Mission:** Providing free, essential tax help to millions.
- **Daunting Challenge:** Navigating complex and ever-changing tax law.
- **The Resource Gap:** Static manuals can't meet dynamic, real-time needs.

The Pitfalls of Using LLMs



- **Hallucinations & Factual Errors:**
- LLMs can confidently generate incorrect information, inventing tax rules or citing non-existent IRS forms. In a high-stakes domain like tax, this is unacceptable.



- **Outdated Knowledge:**
- Models are trained on a snapshot of data from the past. They are often unaware of the most recent changes to tax law, thresholds, or credit amounts, leading to inaccurate advice.



- **Lack of Verifiability (The "Black Box" Problem):**
- It's often impossible to know why a standard LLM gave a particular answer. There is no source citation or audit trail, making it impossible for a VITA volunteer to trust or verify the response.

An AI-Powered Assistant



Volunteer's
Question

RAG System
Searches
IRS Pub 4491

LLM
Generates
a Grounded
Answer

Think of it as an "open-book test" for the AI, ensuring answers are accurate and based on official IRS guidance.

Inside the RAG System: From Question to Answer



Volunteer's Question



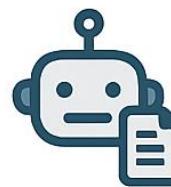
Stage 1: Broad Search (Recall)

Quickly finds the top 500 potentially relevant sections from Pub 4491.



Stage 2: Precise Reranking (Precision)

A more powerful model intensively analyzes and reranks, selecting the top 5 most accurate chunks.



Final Answer Generation

The LLM receives the question + top 5 chunks to generate a grounded, precise answer.

Sample Scenario and Question

- **Scenario:**

Lewis and Oneida Monroe

Lewis, age 26, and Oneida, age 25, are married and will file a joint return. They cannot be claimed as dependents by another taxpayer. Lewis and Oneida have no children or other dependents.

Both work and neither are full-time students. Lewis earned wages of \$15,400 and Oneida earned wages of \$5,600. Lewis and Oneida are U.S. citizens and have valid Social Security numbers.

Lewis and Oneida have investment income of \$5,000.

- **Question:**

Lewis and Oneida are eligible to claim the Earned Income Tax Credit (EITC) without a qualifying child.

- a. True
- b. False

Establishing the Ground Truth

The Process:

- A Certified Public Accountant (CPA) and an IRS-Certified Tax Preparer on our research team independently answered all 130 test questions.
- They then conducted a reconciliation session to resolve any discrepancies and finalize a single, expert-verified "ground truth" answer key.



This ensures our accuracy metrics are benchmarked against true domain expertise.

Methodology: A Rigorous Evaluation

The Benchmark



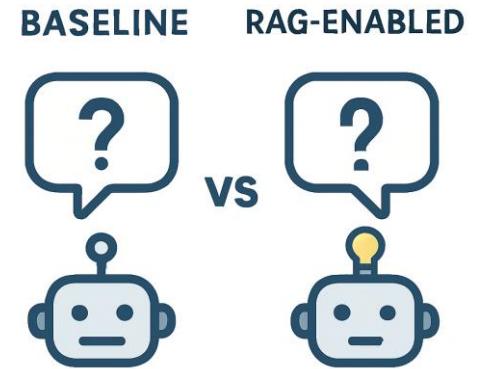
130 official questions
Basic & Advanced
scenarios

The Knowledge Source



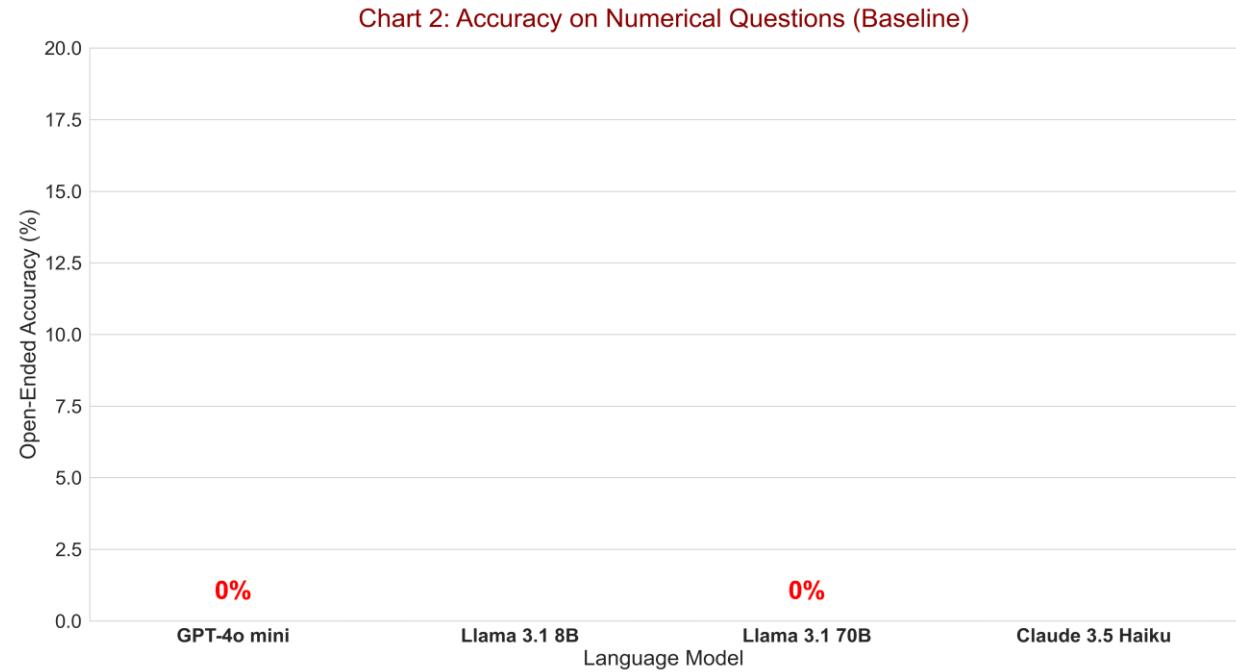
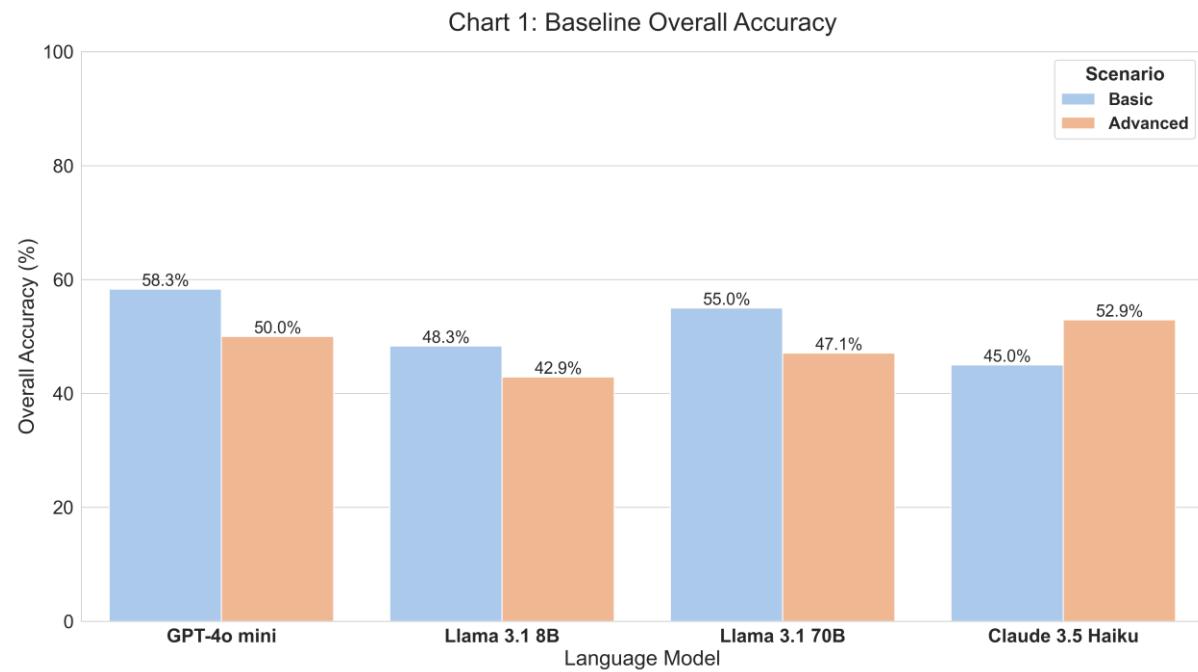
The official VITA volunteer
guide
The AI's "open book"

The Experiment

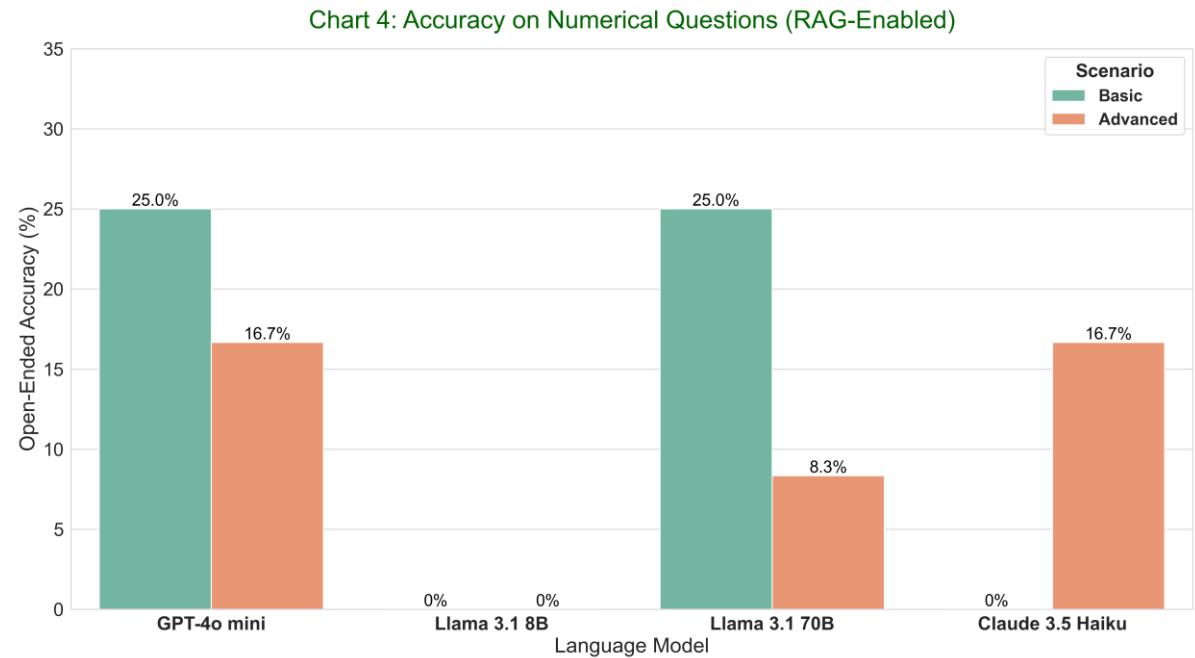
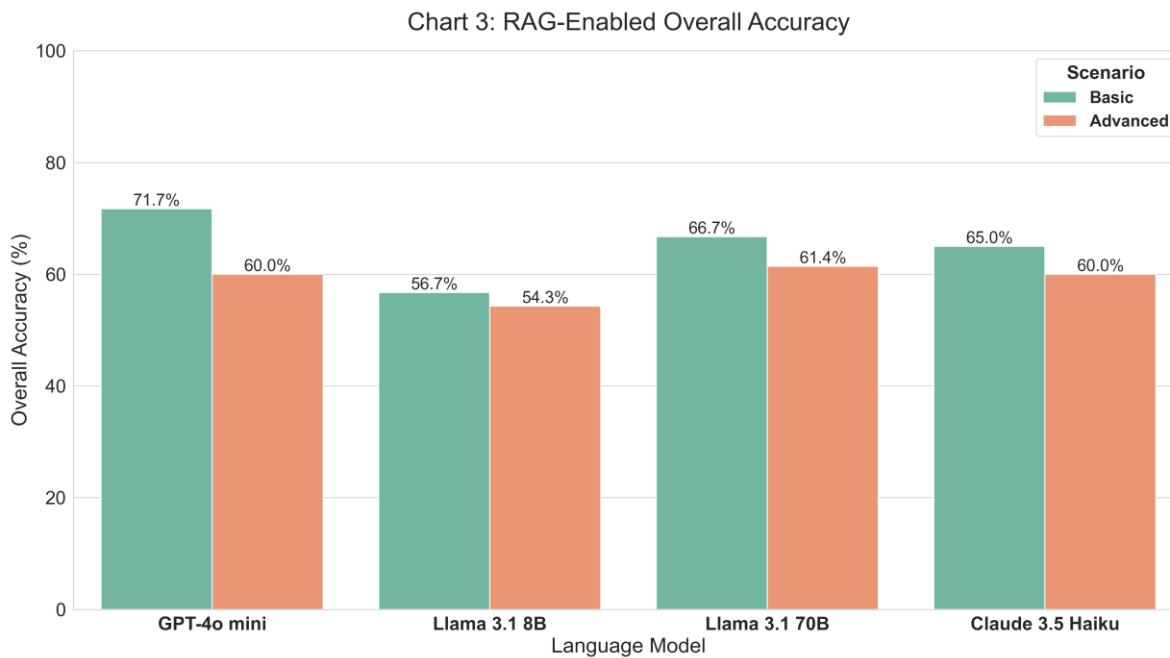


Baseline: AI performance
alone
RAG-Enabled: AI + Pub
4491

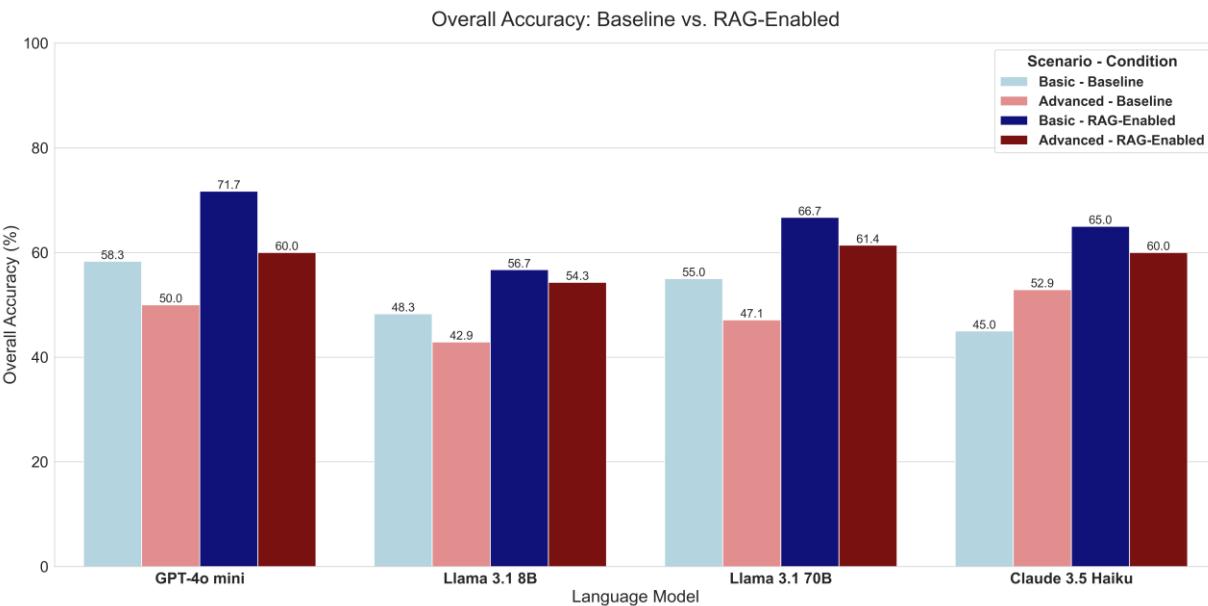
The Baseline: AI Alone Fails at Numerical Reasoning



RAG-Enabled Performance: The Improvement



The Impact of RAG: A Direct Comparison



Overall Improvement:

- RAG consistently boosts accuracy across all models and scenarios.
- We see a gain of up to 13 percentage points.

The Breakthrough on Numerical Tasks:

- For the first time, models could solve open-ended numerical questions, moving from a 0% failure rate to tangible success.
- The improvement on numerical tasks is a crucial first step, but accuracy is still modest.

Discussion & Limitations

Knowledge Scope:

Our system's expertise is currently confined to IRS Publication 4491. It cannot answer questions requiring information from other sources.

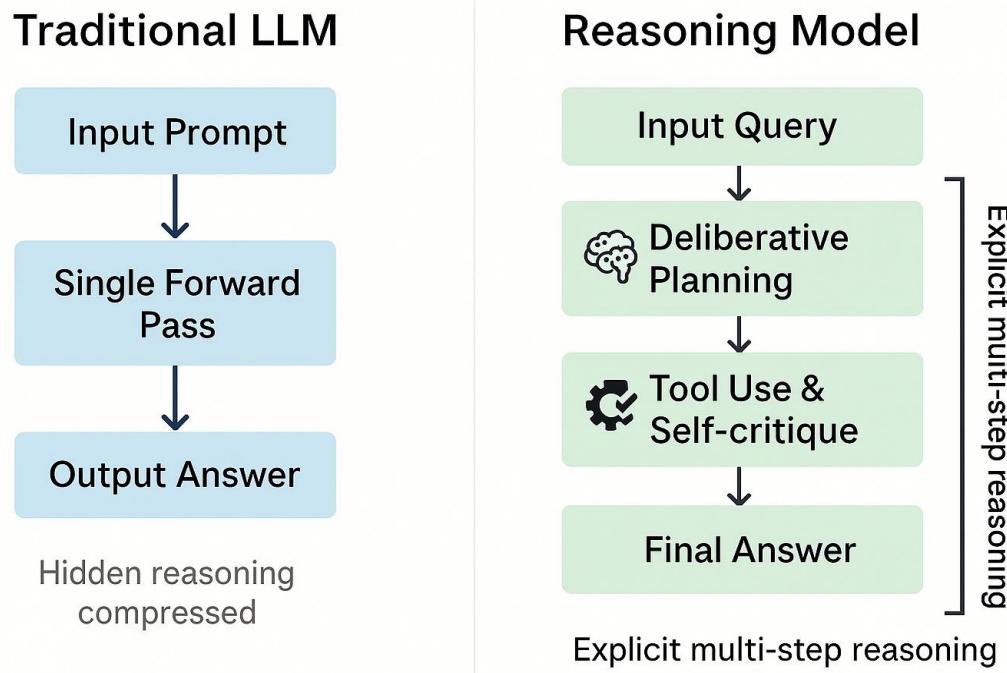
Models Choice:

Because we want to make a free tool for low-moderate income people, we focused on cheaper and smaller models.

Reasoning vs. Recall:

While RAG improves factual recall, it doesn't fully solve the inherent numerical reasoning limitations of some models (e.g., Llama 3.1 8B's 0% OE score). Context is a powerful aid, but not a replacement for a strong base model.

The Next Frontier: Integrating Reasoning Models

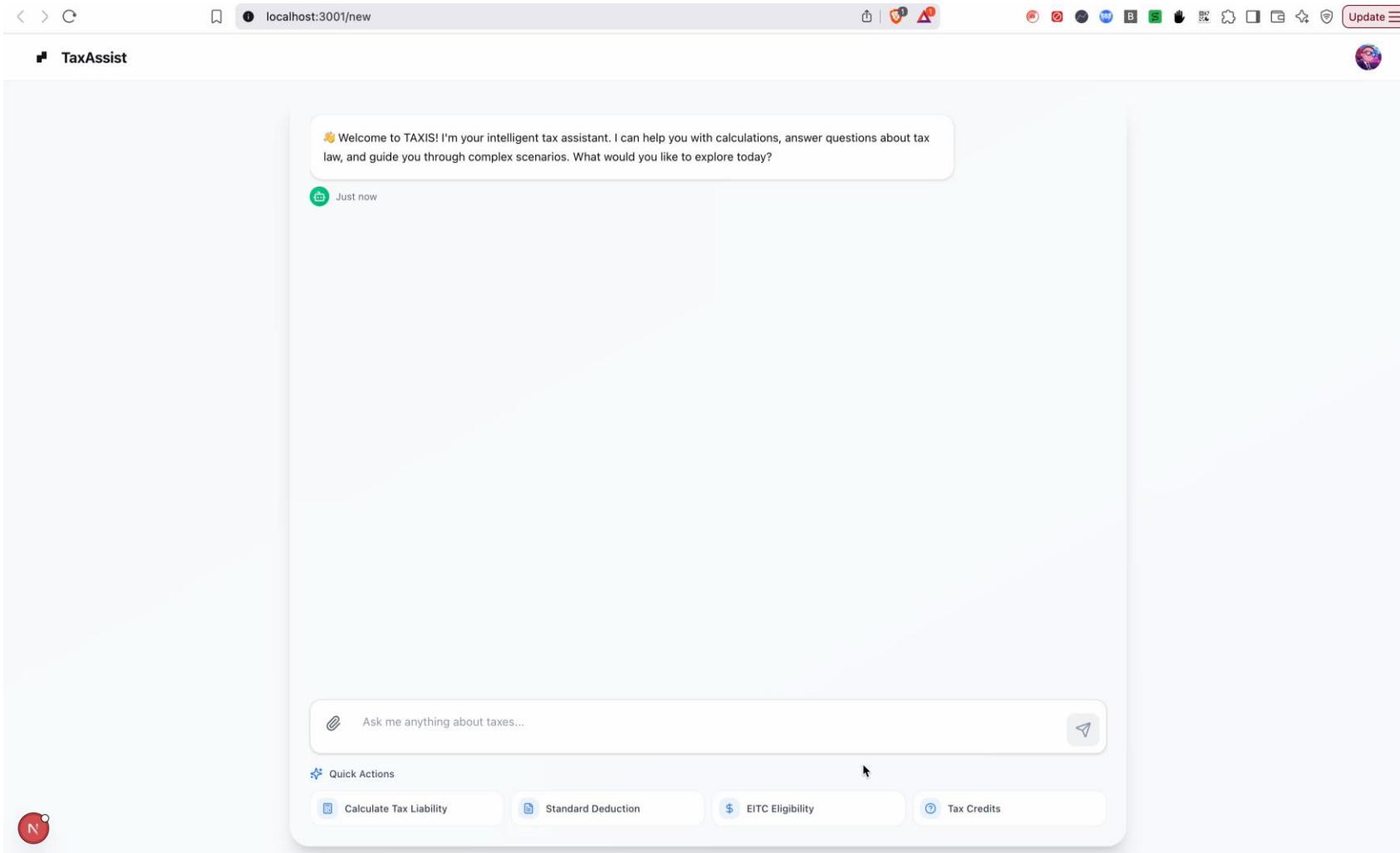


To move from simply retrieving facts to actively reasoning with them to perform verifiable calculations.

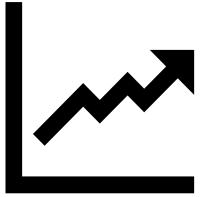
- **Traditional LLMs** (like our current model) excel at recalling and summarizing information in a single pass.
- **Reasoning Models** operate differently. They engage in a multi-step process to:
 - Plan a solution to a complex problem.
 - Self-critique and refine their work before giving an answer.

We saw great promise in using frontier reasoning models being able to get to above 90% accuracy.

Demo



Conclusion & Key Takeaways



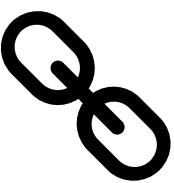
RAG is a Powerful First Step

It significantly improves LLM accuracy and makes solving numerical problems possible



Reasoning is the Next Frontier

To achieve the highest levels of trust and accuracy, we must move from retrieval to explicit, multi-step reasoning.



The Future is Hybrid

The ultimate AI tax assistant will be a hybrid system that combines RAG's factual grounding with a reasoning model's calculation power.

Thank you for listening
Any Questions?



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June 12th, 2025

A Risk Based Estimate of the Large Corporate Income Tax Gap

Kenneth Tester

Jonathan Fieman

15th Annual IRS/TPC Joint Research Conference on Tax Administration



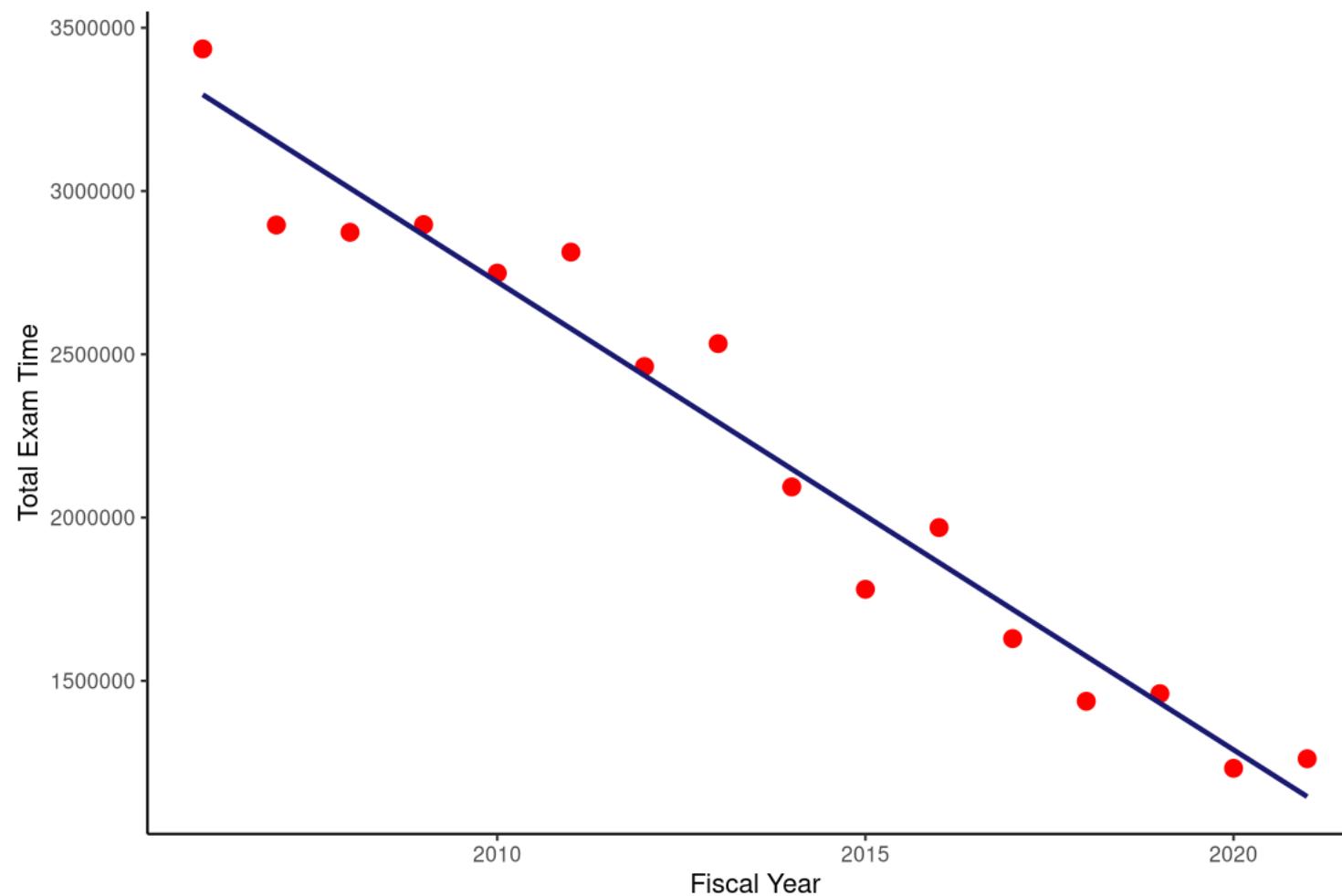
Disclosure

These views are the authors and do not necessarily reflect the views of the Internal Revenue Service or the Department of the Treasury.

- **In the last 25 years, there have been substantial changes in information reporting for corporate tax returns.**
 - Schedule M-3 (2004), Fin 48 (2006), Schedule UTP (2010), Form 3800 redesign (2011), and Country by Country Reporting (2017).
- **Data availability and computing power have greatly increased.**
- **Additionally, in 2017 the Tax Cuts and Jobs Act substantially altered the corporate tax system.**
 - Tax rate fell from 35% to 21%
 - GILTI, BEAT, FDII

- Unlike the individual income tax gap, the corporate tax gap faces 3 distinct challenges:
 1. No NRP: This causes issues with both *selection* and *completeness*.
 2. No DCE: Final adjustments aren't adjusted for undetected noncompliance.
 3. Sustention: Corporate tax issues involve substantial gray issues which are often settled through appeals or tax court.
- The lack of a standardized research audit procedure for corporations makes the average audit sensitive to operational changes.
 - The real value of the IRS enforcement budget has fallen by 20% between 2006 and 2017.

Total Exam Time by Fiscal Year Closure



- **Previous method relies on extrapolation of audit results to the full population**
 - Operates under strong assumptions regarding noncompliance in population.
 - Reliant on audit coverage and quality for consistency across years.
- **This makes comparisons over time difficult without adjustments for audit rate changes or per exam resources.**
 - Data analytics improve efficiency, but not fully.
- **New approach needs to flexibly adapt to changes in examiner resources and population characteristics.**

There are 2 ideas that underpin the new estimation method:

- 1. The tax gap should be based upon population characteristics.**
 - Individual income tax gap works this way through stratification of NRP.
- 2. Conditional on risk, unaudited returns and audited returns would have similar relative adjustments.**
 - Thus a given risk level controls for the selection process.

New Approach:

- Utilize risk measures from LB&I to create a risk score tied to audit adjustments.**
- Partition the population into risk bins and assign the average voluntary reporting rate (VRR) in the risk bin.**

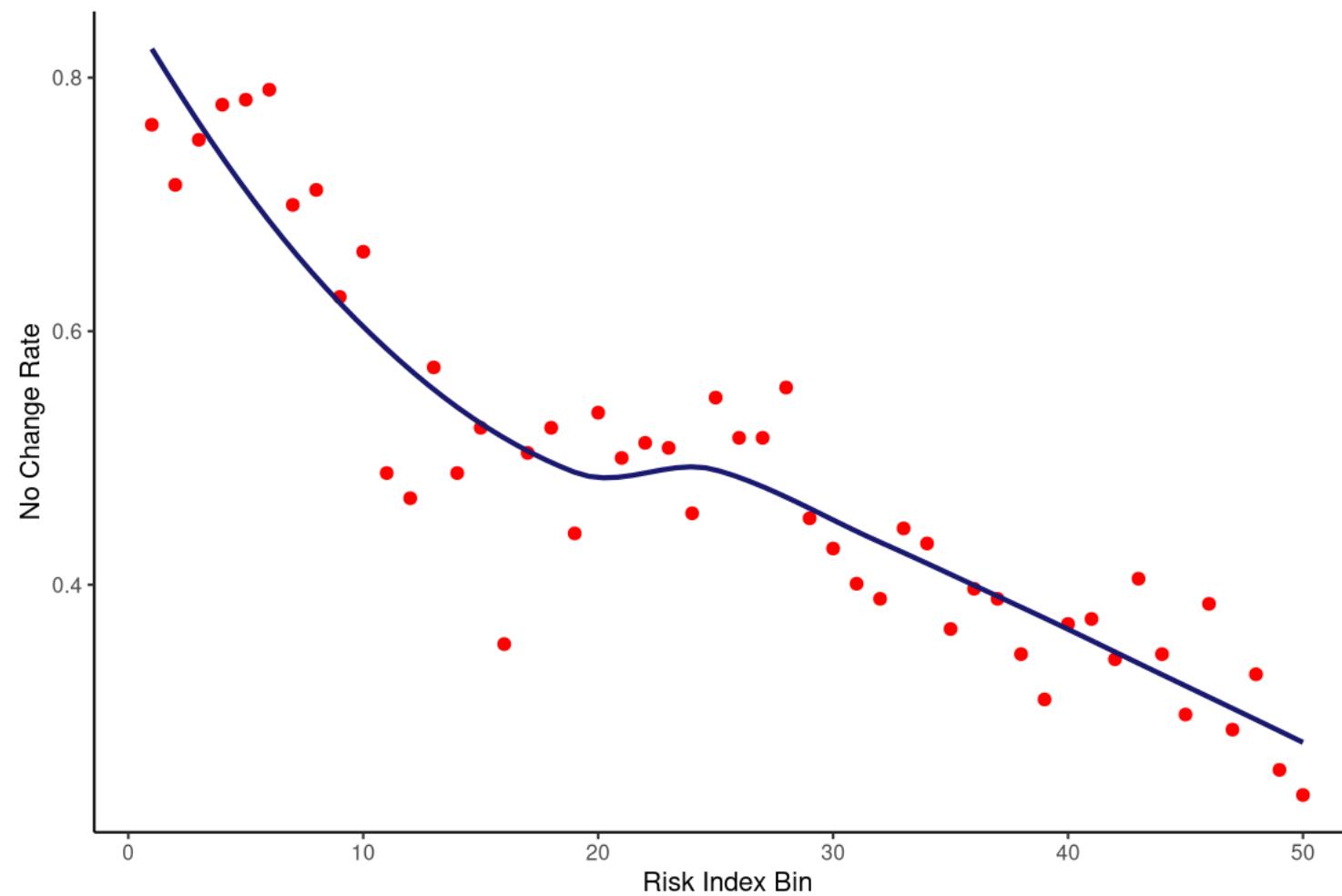
- The Extreme Value Method (EVM) was first used in TY 2006 to estimate the tax gap.
 - Method is based off the idea that audit yields follow a pareto distribution. (Axtel 2001, Bloomquist et al. 2014)
- Method works by utilizing audits above a certain threshold size and estimating their distribution.
 - Assumes that the fraction of above threshold audits in the audited population is the same as in the full population.
 - The distribution is then extrapolated to the full population, assuming that the unaudited returns are dominated by the audited sample.
- Prior to EVM, it was assumed that examiners detected all noncompliance for large corporations.

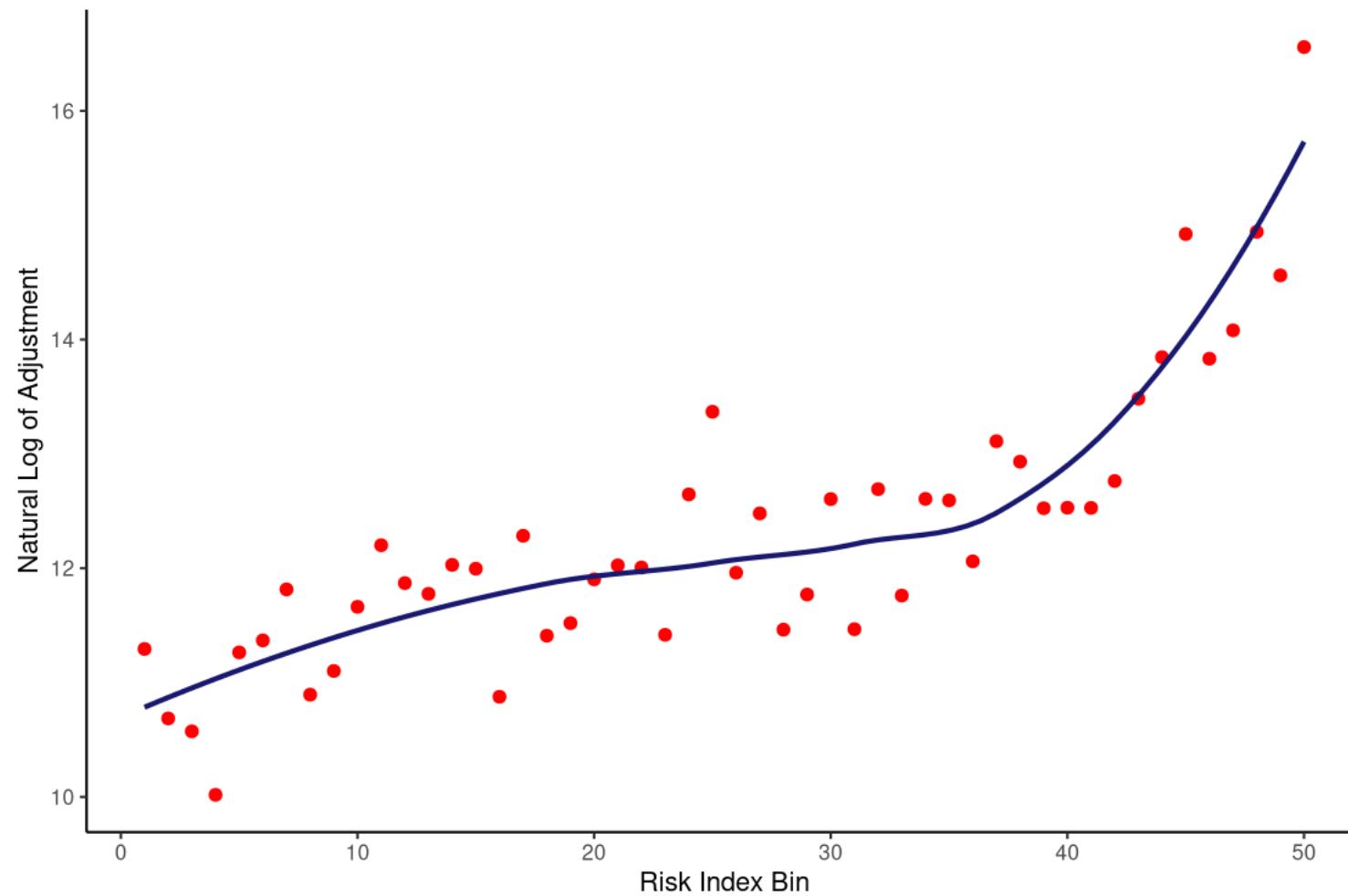
EVM Table

- **Audit data comes from Audit Information Management System (AIMS)**
 - Contains information on exam time, projects, and adjustments.
 - Tax Years 2010-2017.
- **Returns data comes from the following sources:**
 - **Business Returns Transaction File (BRTF):** Universe of originally *processed* returns.
 - **XML Returns Data Base 2.0 (XRDB2):** universe of electronically *filed* returns along with accompanying information returns.
 - **Data Capture System (DCS):** paper filed returns for corporations with assets greater than \$10 million with accompanying information returns.
 - DCS is reliably available starting in tax year 2008.
- **Paper returns represent a small fraction of large corporate returns (5%) a minuscule share of dollars (~1%).**

- Risk indicators come from LB&I Large Corporate Compliance (LCC) model
 - Roughly 20 indicators relating to operations of multinationals.
 - Best thought of as a proxy for risk.
- Data driven risk index following Lobotsky and Wittenberg (2006)
 - Standardize risk variables $\sim N(0,1)$
 - Regress examiner determined adjustments on the risk variables for audited population, obtaining β^Z for each Z
 - Obtain index Z_i^ρ
$$Z_i^\rho = \frac{1}{\beta^\rho} \sum_{n=1}^N \beta^n Z_i^n$$
 - Where β^ρ represents a standardization adjustment

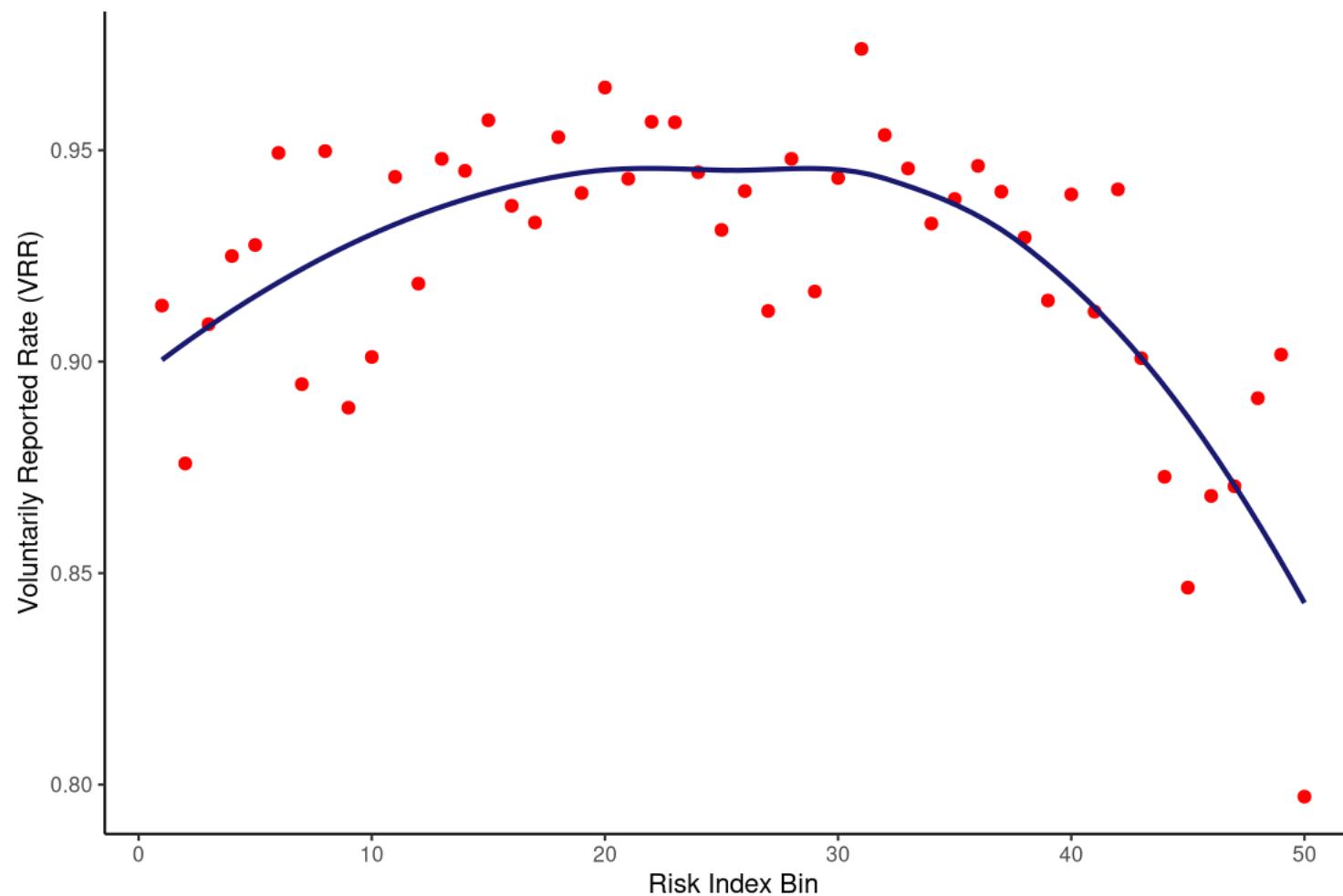
- Risk index is distributed $Z_i^0 \sim N(0, 1)$.
- Following Agrawal and Tester (2024), we divide the index into percentile bins.
 - Largest returns are concentrated at the top, so granularity is particularly useful
 - We divide the audited population into 50 percentile bins (0-2, 2-4, ..)
- Risk index percentiles seems to do a reasonable job of measuring the riskiness of the audited returns
 - Audit inputs and outputs seem to be positively correlated with risk bins.





- Using the percentiles from audited population, assign full population to bins.
 - Implicitly the same effect as doing the reverse.
- Given small variations in risk scores at less risky bins, we aggregate up some of the smaller bins by 10s and 5s.
 - Minimal impact on tax gap estimate but may reduce noise if incorporating standard errors.
- Returns are then assigned the average voluntary reporting rate (VRR) of the audited returns in that risk bin.
 - Could use average adjustment, but this measure seems to best for size differences.

The key identifying assumption is that returns that occupy a given risk bin have similar compliance behavior.



Year	Tax Revenue (billions)	New Method (billions)	Previous Method: Projection (billions)	Previous Method: Estimate (billions)
2014	\$298.7	\$31.98	\$22.14	\$14.40
2015	\$291.6	\$29.21	\$21.61	\$12.12
2016	\$276.3	\$26.43	\$20.48	\$6.76

- Risk approach leads to a modestly larger tax gap
 - Slightly larger than projections (35%), significantly larger than estimates.
- Applies well to projections of the tax gap
 - Can estimate the risk index on a set of years and can project to future years.
- While it does a good job of modeling noncompliance of returns with largest adjustments, other compliance issues exist.
 - Domestic only firms face different compliance challenges, might require additional modeling.

While this method addresses some issues with previous approach, several challenges remain unaddressed.

- Completeness, detection, and sustention issues remain unaddressed.

Step	Action
1	For all operational audit cases (S) in a selected tax year, sum the net recommended tax change for cases with a refund amount (i.e. negative net tax change). Record this amount as R .
2	Delete all audit cases having a refund amount or no tax change.
3	Sort the remaining cases (i.e. those with a positive net recommended tax change) in ascending order by tax change amount.
4	Compute a cumulative sum for tax change.
5	Identify the audit case number (m) where the cumulative sum of tax changes is just equal to or less than the total refund amount (R).
6	Delete all cases up to and including case m . Let N represent the number of remaining audit cases. The sum of net recommended tax changes for these N firms is approximately equal to the total recommended tax change for all S operational audit cases.
7	Let $p = N/S$ = the proportion of cases remaining after steps 1 to 6.

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FATCA Turns 10: Dynamic Trends from 10 Years of Third-Party Reporting Under the Foreign Accounts Tax Compliance Act

John Iselin, Congressional Budget Office

Niels Johannessen, University of Copenhagen

John Guyton, Internal Revenue Service

Patrick Langetieg, Internal Revenue Service

Daniel Reck, University of Maryland

Max Risch, Carnegie Mellon University

Joel Slemrod, University of Michigan

IRS-TPC Joint Research Conference 2025

This project

- The Foreign Accounts Tax Compliance Act: an attempt to curb offshore tax evasion with robust, automatic information reporting.
 - Requires all foreign banks to report to IRS information on ownership and on assets held at these institutions and owned by US persons
 - Passed in 2010, third-party information reports began in 2014
- **Research questions** for our ongoing work on FATCA:
 - 1) What do these data reveal about American's offshore holdings?
 - 2) How did taxpayer behavior respond to FATCA?
- Today's presentation: 1) with an emphasis on dynamics through first years of FATCA reporting, a little very preliminary evidence on 2).

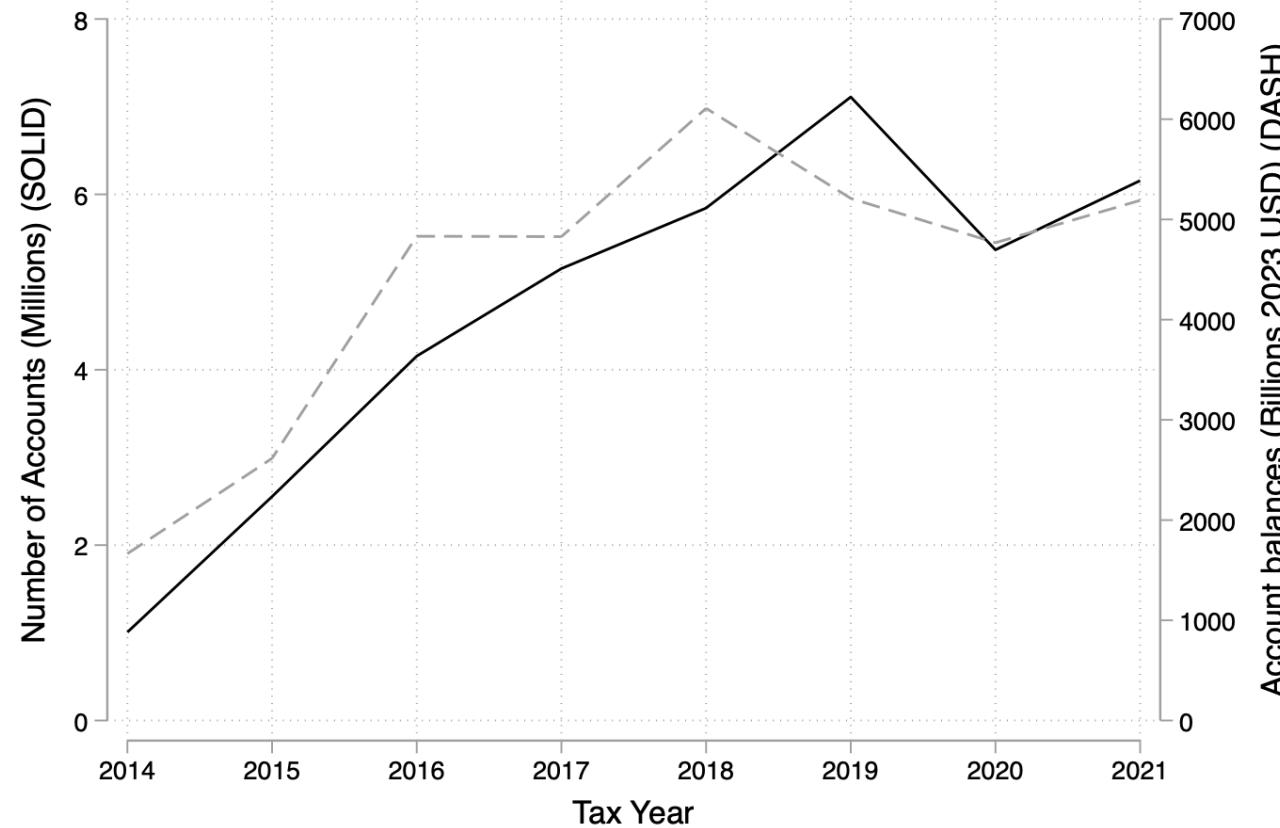
Data

- Primary data source: Form 8966, on which foreign banks report on assets/income in foreign accounts and identify US owners.
- We focus on **account balance** and **owner types**:
 - Owner types assigned based on TIN matching to tax returns and other forms.
 - Note: publicly traded companies, non-profits, and financial institutions are exempt from 8966 reporting; sometimes unnecessary reporting occurs.
 - F8966 income reporting is incomplete/inconsistent (Johannesen et al 2024 TP&E).
 - Decompose some aggregates by groups of countries based on haven/non-haven status.
 - “Havens” is a shorthand descriptor of countries that are low tax jurisdictions and serve as financial centers, as is commonly used in economics literature
 - In line with prior work, we use the list from Johannesen et al. (2020), which is the OECD (2000) list plus, Switzerland, Singapore, Hong Kong, and Luxembourg.
 - The IRS does not have any official designation of haven v. non-haven countries and there is no such definition in FATCA law or administration.
- Also use data from Foreign Bank Account Reports (FBARs), and tax returns of matched owners.

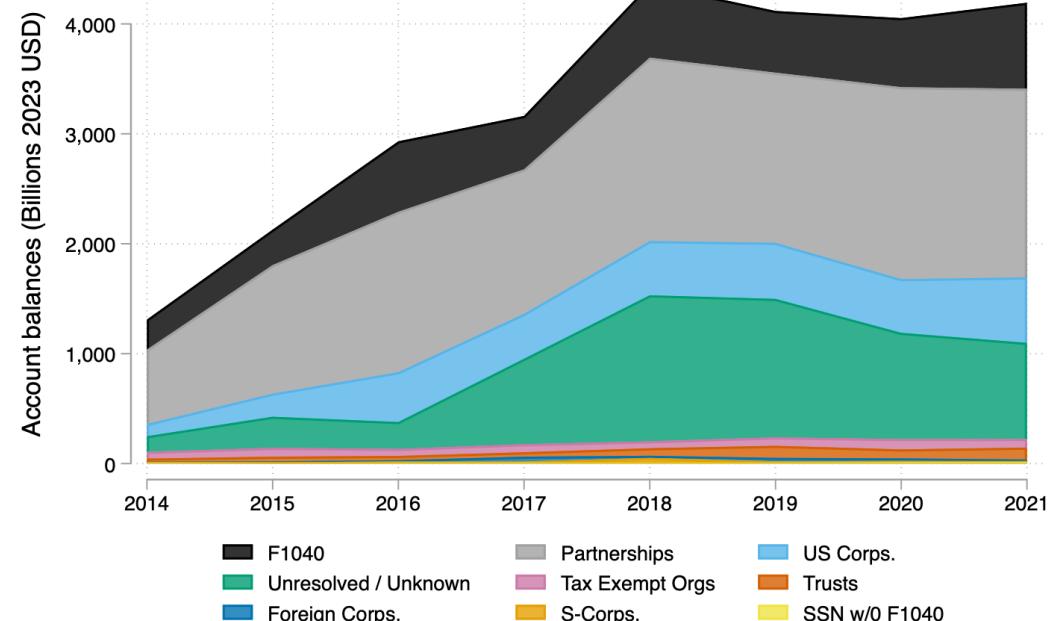
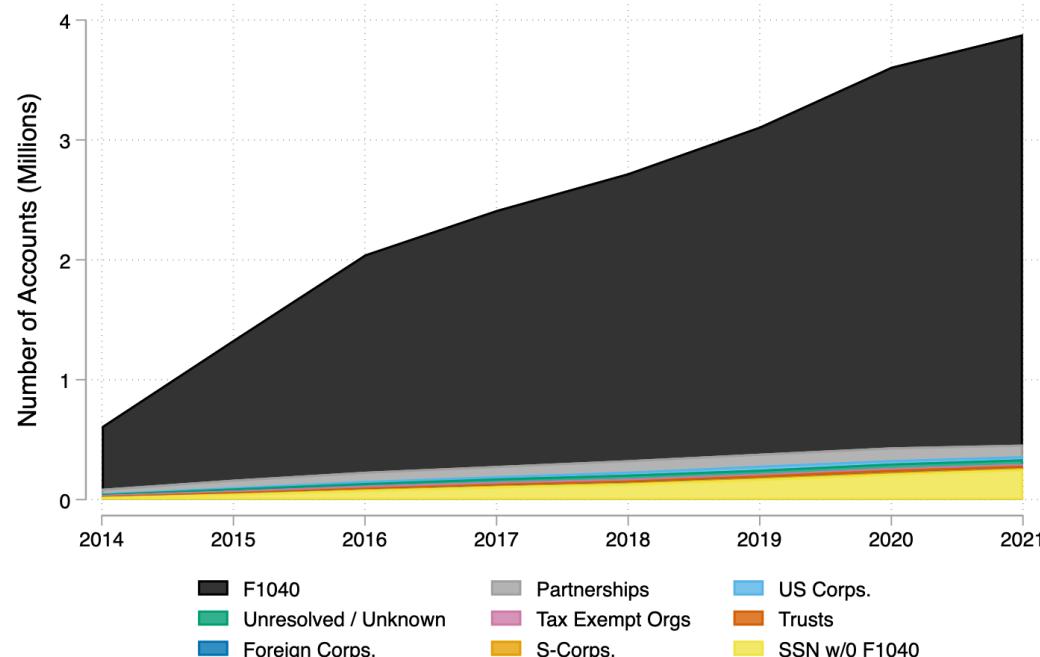
Summary of Prior Findings for Context

- Johannesen et al (2020 AEJ:Policy)
 - Offshore crackdown in 2008 (mostly pre-FATCA) led to a spike in disclosures of offshore wealth via Foreign Bank Accounts Reports (FBARs)
 - \$100 billion disclosed on new FBARS by 55k individual Americans btw 2009-2011, mostly outside Offshore Voluntary Disclosure programs
 - what has happened to FBAR disclosures since 2011?
- Johannesen et al (2024 TP&E)
 - Descriptive analysis of FATCA reporting up to 2018
 - TY2018 totals: \$4.0 T of wealth; 49% in havens; >46% owned by entities (esp partnerships)
 - Concentration: 64% of wealth owned by individuals or partnerships belongs to top 1% by income; 62% of individuals in top 0.01% own an account.
 - Increases in reporting quality and totals reported over time during this period.
 - Many FATCA records had missing TINs in early years. Now we build on internal work to assign TINs via name matching.
 - How have these ownership patterns changed in more recent years?

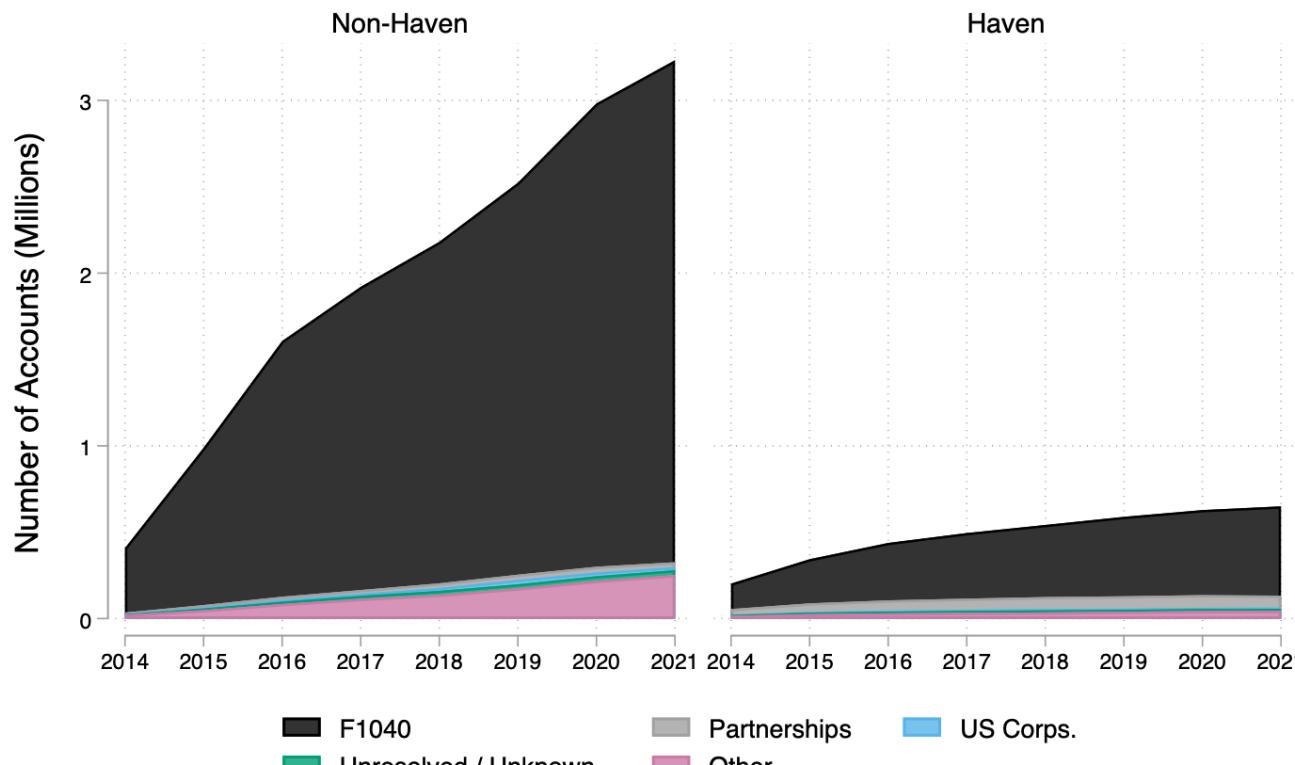
No. of FATCA Accounts & Account Balance over Time



FATCA Accounts By Owner Type



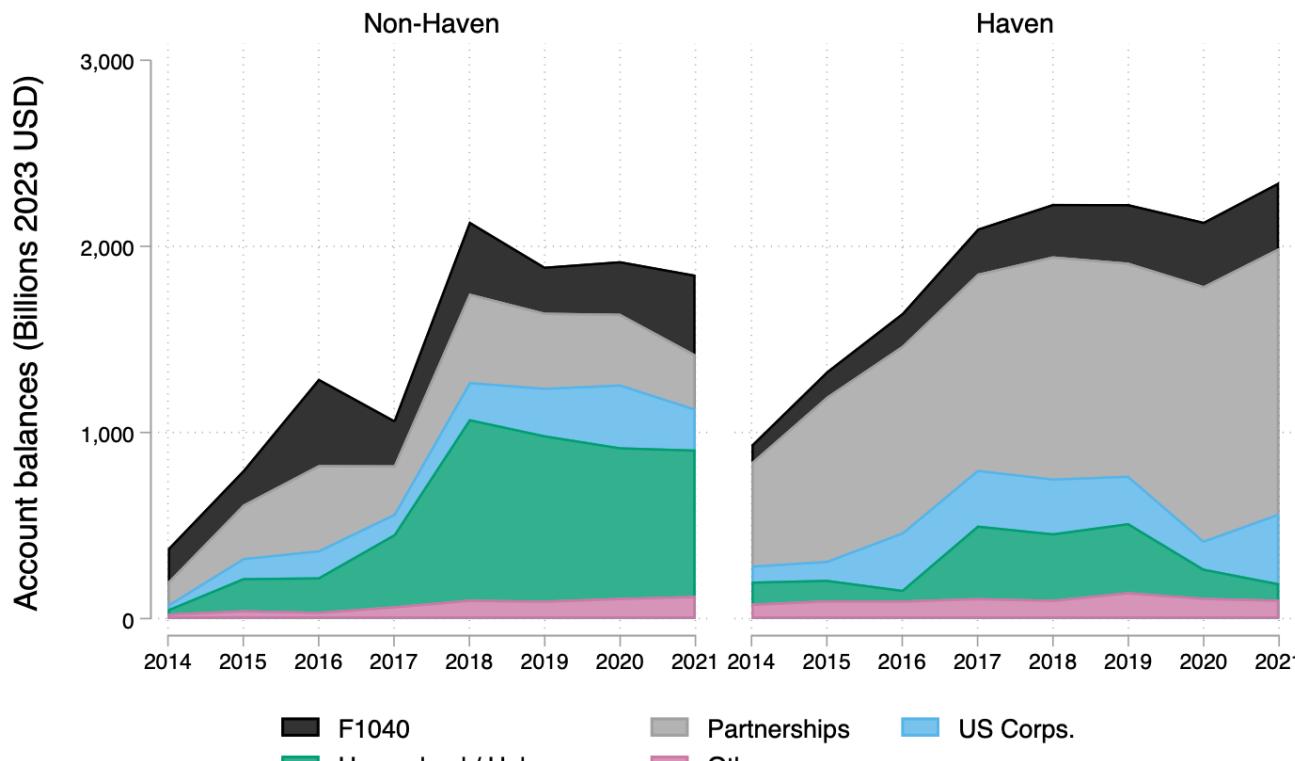
Number of FATCA Accounts By Type and Haven



Graphs by Tax Haven Designation

- * “Havens” is a shorthand descriptor of countries that are low tax jurisdictions and serve as financial centers, as is commonly used in the literature
- The IRS does not have any official designation of haven v. non-haven countries and there is no such definition in FATCA law or administration. In line with previous literature, we use the list from Johannesen et al. (2020), which is the OECD (2000) list plus, Switzerland, Singapore, Hong Kong, and Luxembourg.

Size of FATCA Accounts by Type and Country Group



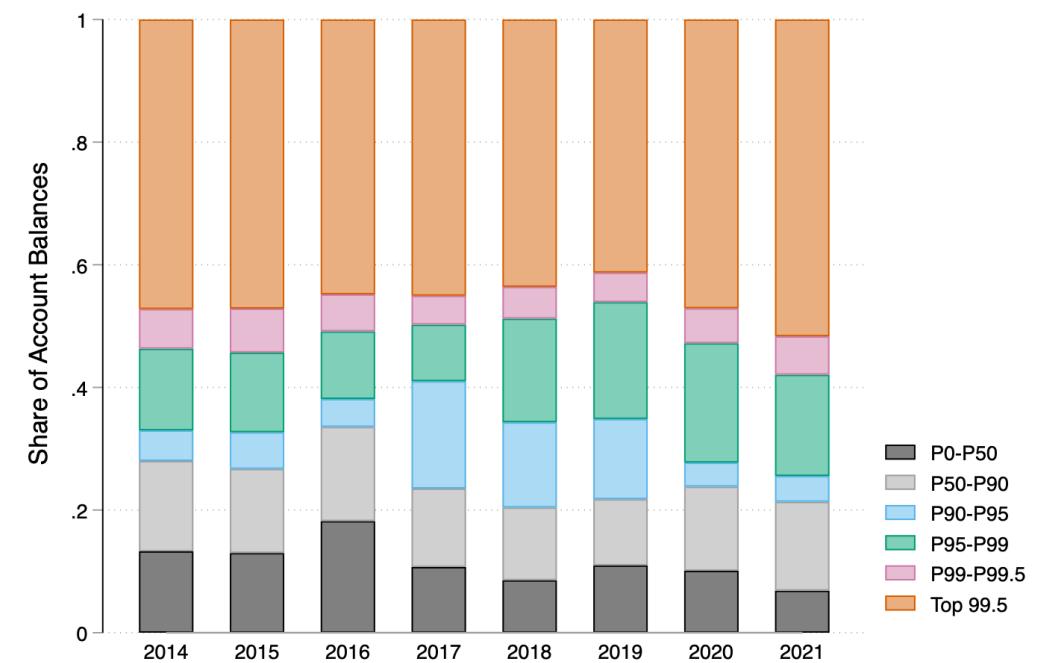
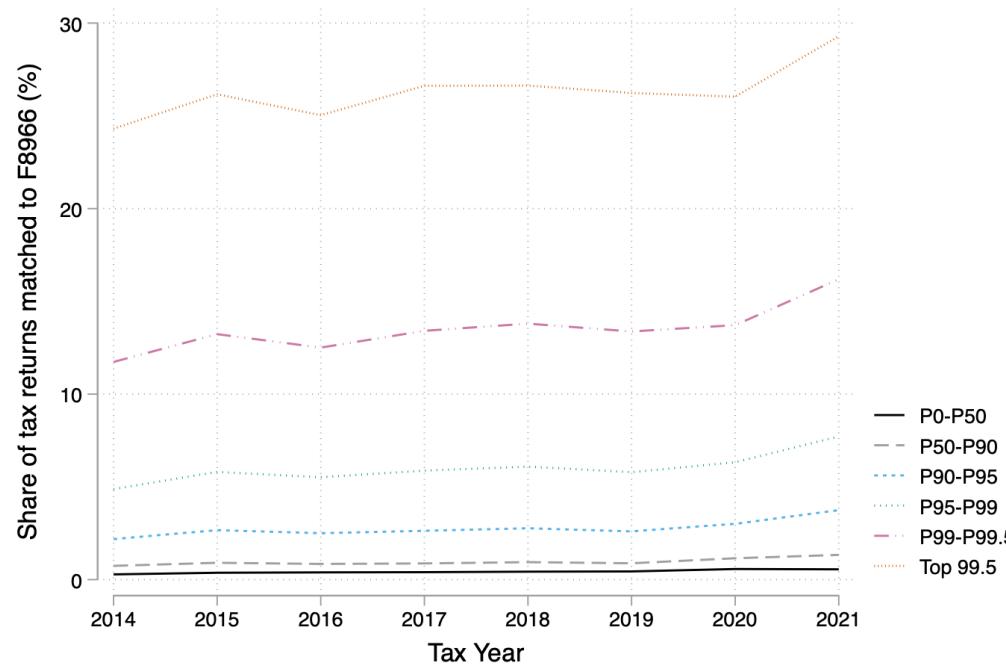
- Boas et al (2024) document large repatriation responses w/Danish data in response to Common Reporting Standard implementation (a global initiative similar to FATCA).
- We do not see evidence of large repatriation responses here, even in havens.
- If repatriation is occurring, it occurs before FATCA is implemented and/or its effects are dominated by increases in non-repatriated reported wealth.

Graphs by Tax Haven Designation

Details on Unresolved Matches

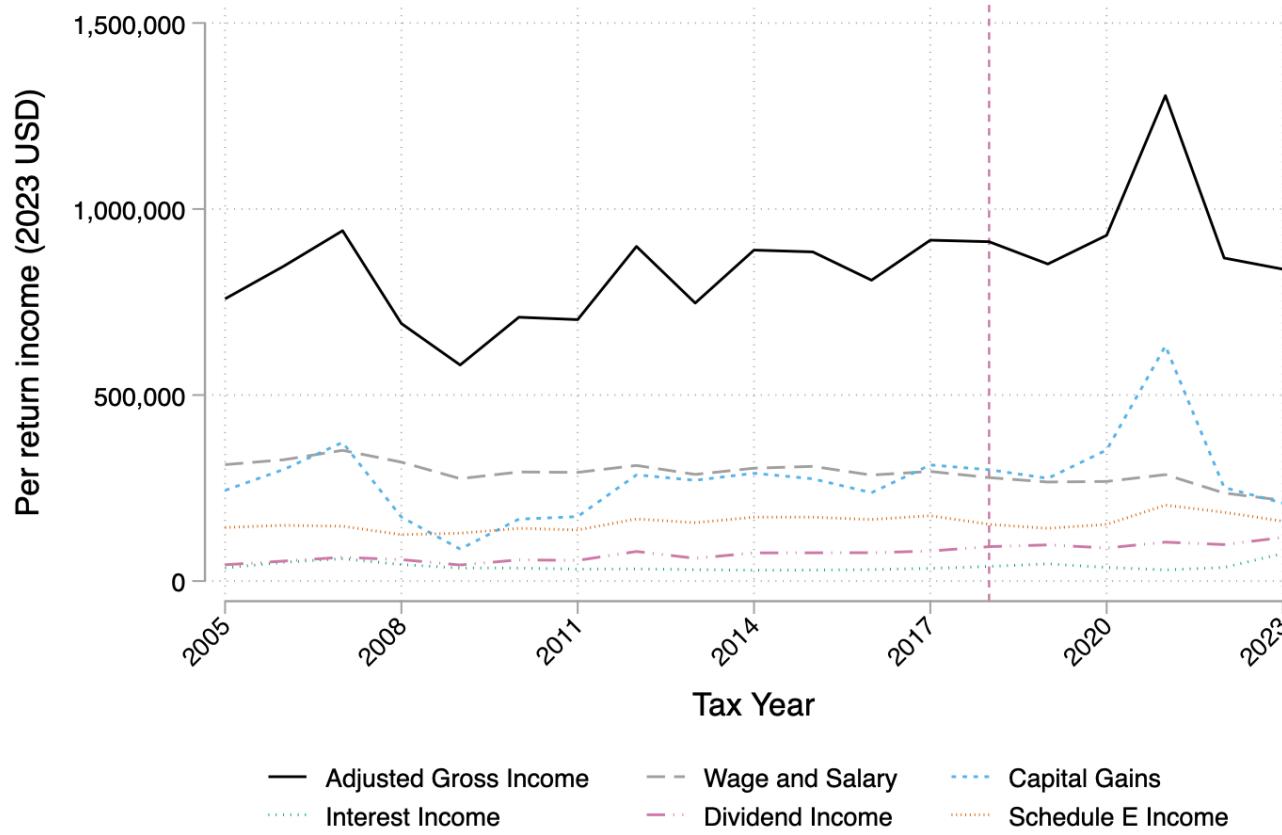
	Share of Unresolved Accounts	Share of Dollars in Unresolved Accounts
Matches F1120 or F1120-s and some other form	3.1	4.6
Matches F1040 but not other matching criteria	60.4	59.5
<i>Matches F1040 only</i>	26.5	3.7
<i>Matches 1+ other forms (e.g. F1042, F940)</i>	33.9	55.8
Matches F940 (employer unemp. tax return) and none of the above	32.5	32.2
<i>Matches F940 only</i>	15.5	5.8
<i>Matches 1+ other forms</i>	17.1	26.4
Matches F1042 (withholding for US income of foreign persons) and none of the above	1.3	2.8
<i>Matches F1042 only</i>	1.2	2.8
<i>Matches 1+ other forms</i>	0.1	0.0
All Others	2.6	1.0

Linked F1040-FATCA filers over time



Note: Henceforth we focus on individual owners, directly and through partnerships; other 8966 accounts excluded.

Per capita income by source of panel



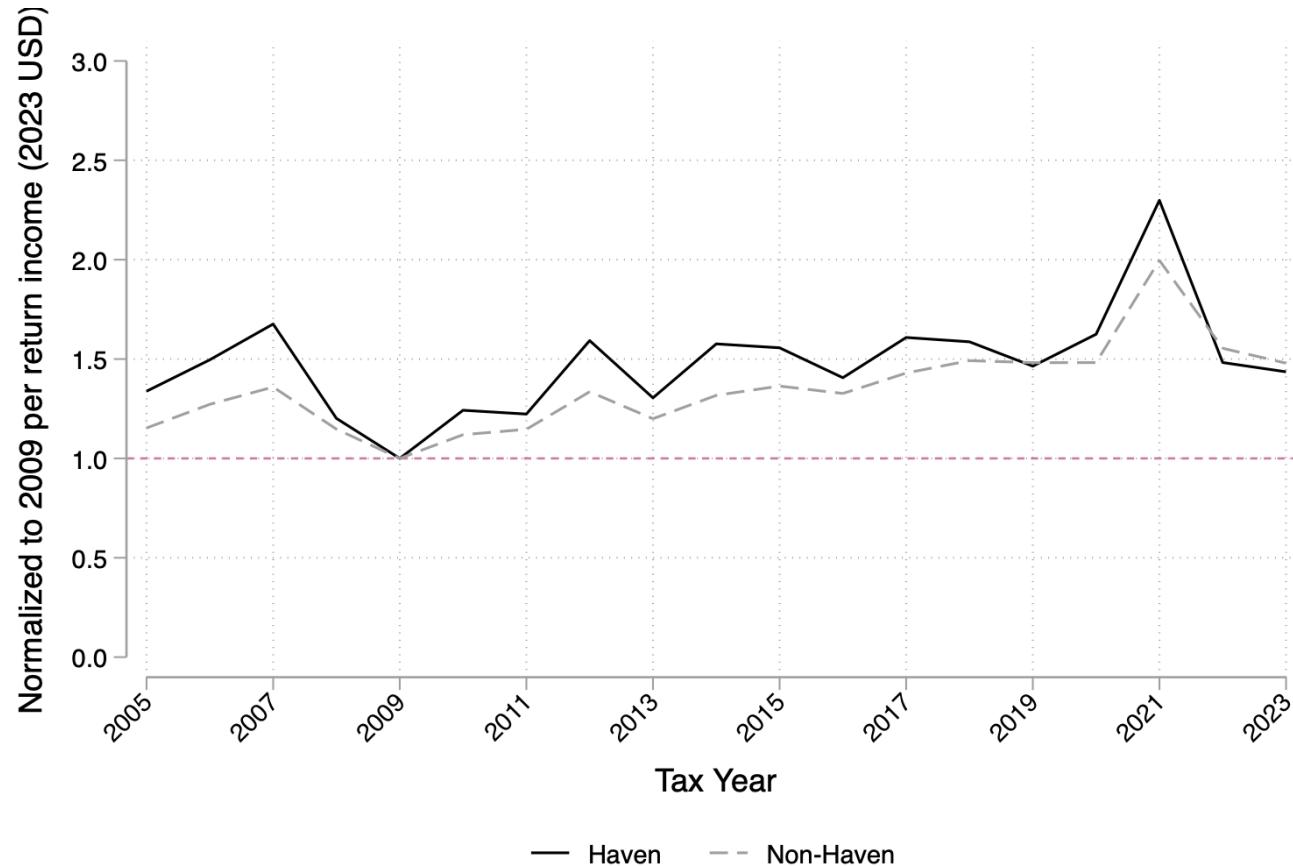
- Panel of tax returns who:
 - Filed 2005-2023
 - Were linked to a F8966 in 2018
- No obvious income response
- How might we expect? Obs. per-capita account balance x 6%. return = \$106,000 (2023 USD)
- Caveats:
 - No control group
 - Selected sample
 - No SEs

Panel of 2018 FATCA filers, by income source, by Haven



Graphs by presence of F8966 from tax haven in 2018.

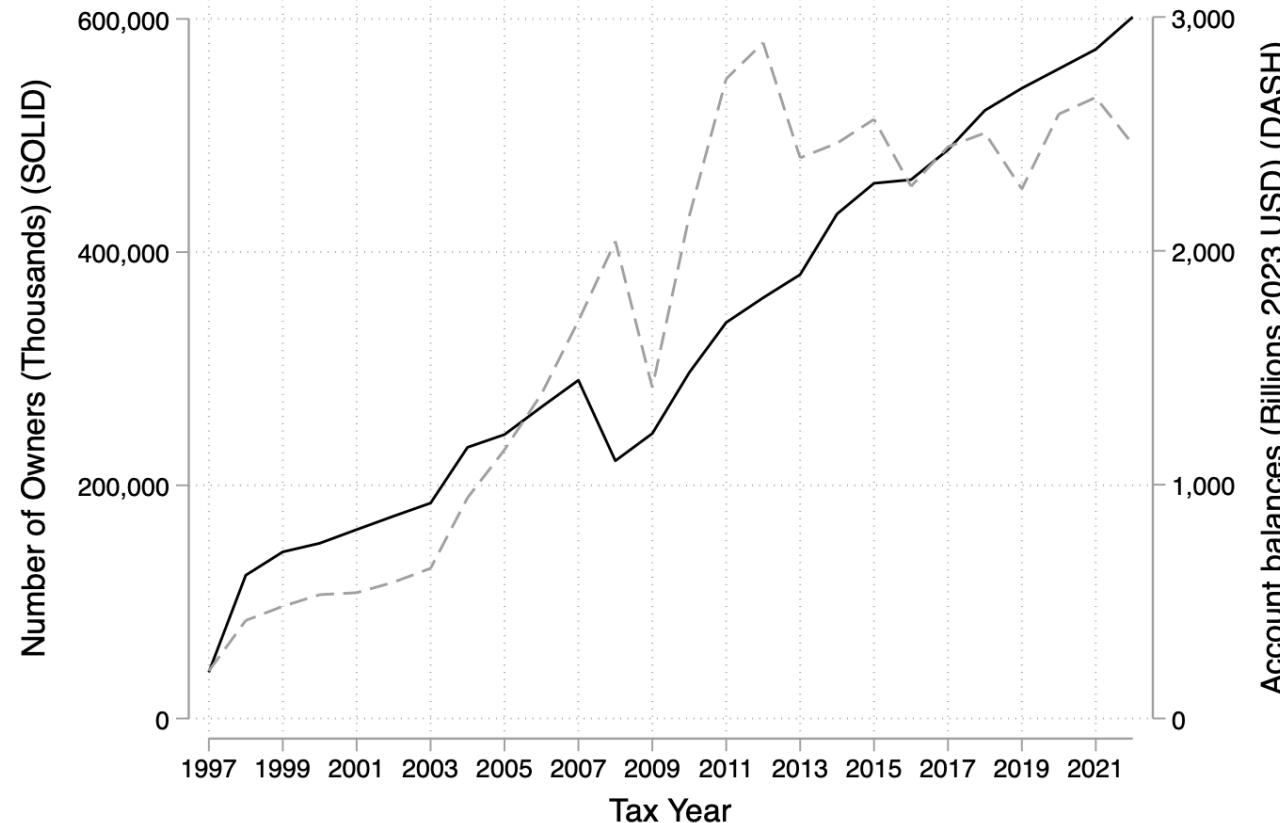
Panel of 2018 FATCA filers, normalized AGI, by Haven



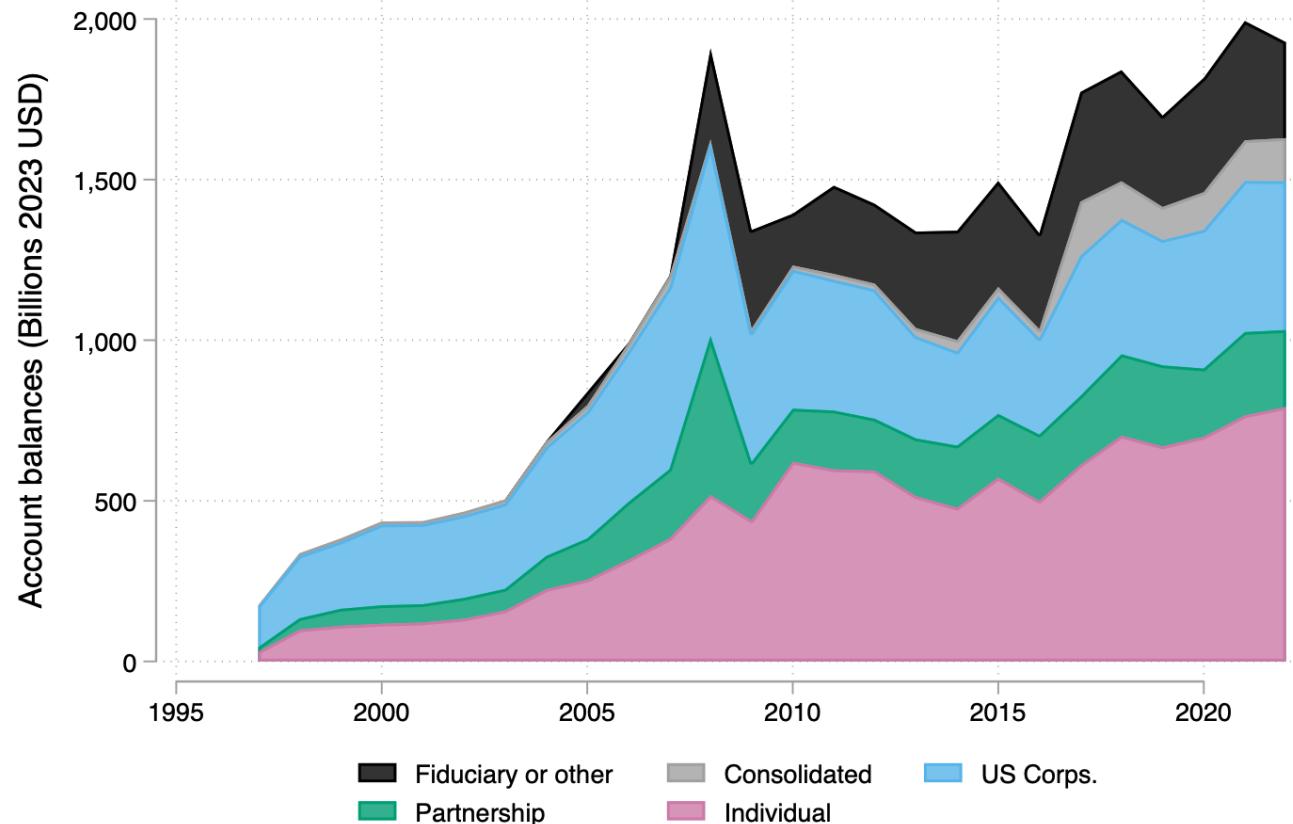
Foreign Bank Account Reports

- FATCA filing requirements apply to a broader class of offshore assets, e.g. debt/equity interests maintained offshore that are not in what we ordinarily call a financial account.
- FBAR filing requirements have lower filing thresholds.
 - FBAR: report if account balance > \$10,000 at any point in year
 - F8966: US residents report if asset value > \$50 at year end or \$75k at any point. Minima are 4x higher for non-US residents, 2x higher if married.
- A few other differences, e.g. in who files in the case of joint ownership via a partnership.

FBAR aggregates over time



FBAR aggregates over time by filer type



Note: fiduciary/other are usually those with signature authority but no financial interest in accounts. Other groups are taxable on their financial interest in the account.

Conclusion

- After initial ramp-up in reporting, total reported offshore wealth hovers around \$4 trillion and slightly increases, showing no obvious traces of repatriation
- Haven wealth is predominantly owned by partnerships
- Non-haven wealth is mainly owned by individuals, partnerships, and, increasingly, owners we cannot yet classify with confidence
- Share of wealth matched to top 0.5 % by income increases slightly from 2018 to 2021. (Caveat: selection bias & unmatched accounts).
- Reported wealth on FBARs continued to increase sharply since 2008 as FATCA went into effect, now over \$1.5 trillion for taxable owners



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June 12, 2025

Behavioral Effects of Tax Enforcement on Non-Compliant Business Taxpayers: Evidence from Administrative Tax Data

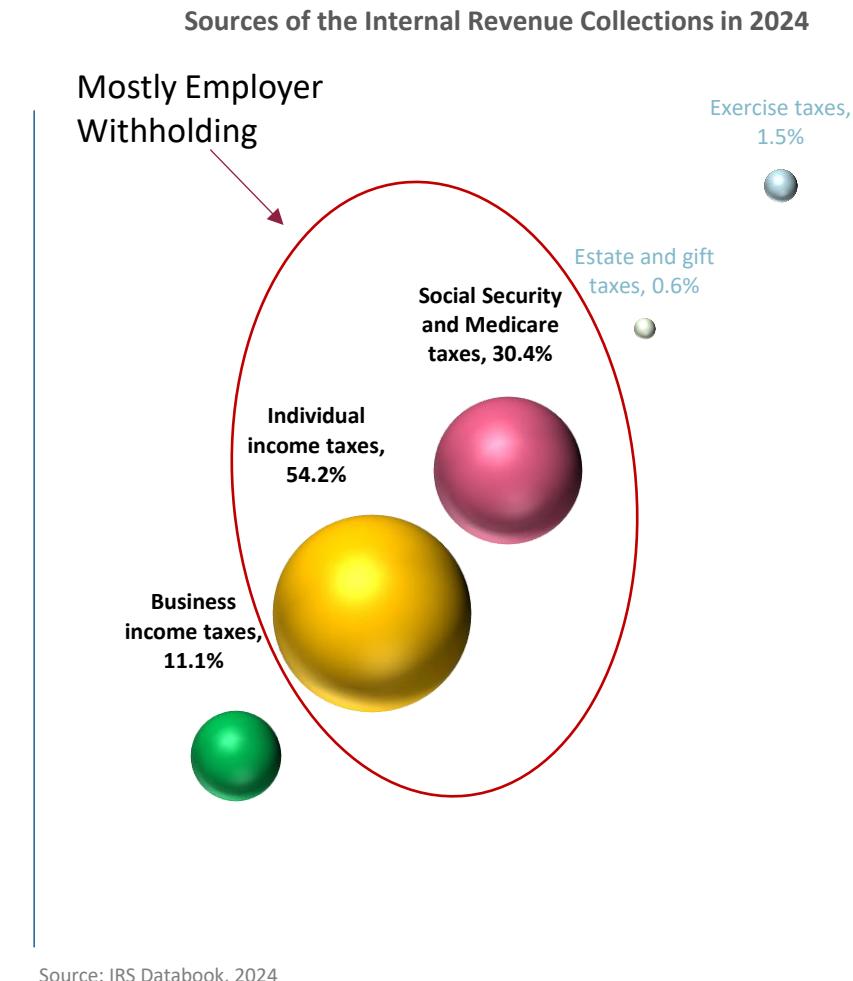
This is preliminary. Please do not cite or circulate.

Alex Turk, Yan Sun, Brett Collins, Mark Payne, Sean Roh, and Chris Wilson

Research, Applied Analytics, and Statistics (RAAS)
Internal Revenue Service (IRS)

Business taxpayers play a critical role in the US tax system

- Businesses make frequent deposits associated with both businesses' and employees' tax liabilities through filing quarterly returns related to their tax and deposit obligations.
- Businesses also influence the individual side as they are charged with holding "in trust" most of the income and trust fund taxes that employees must pay.

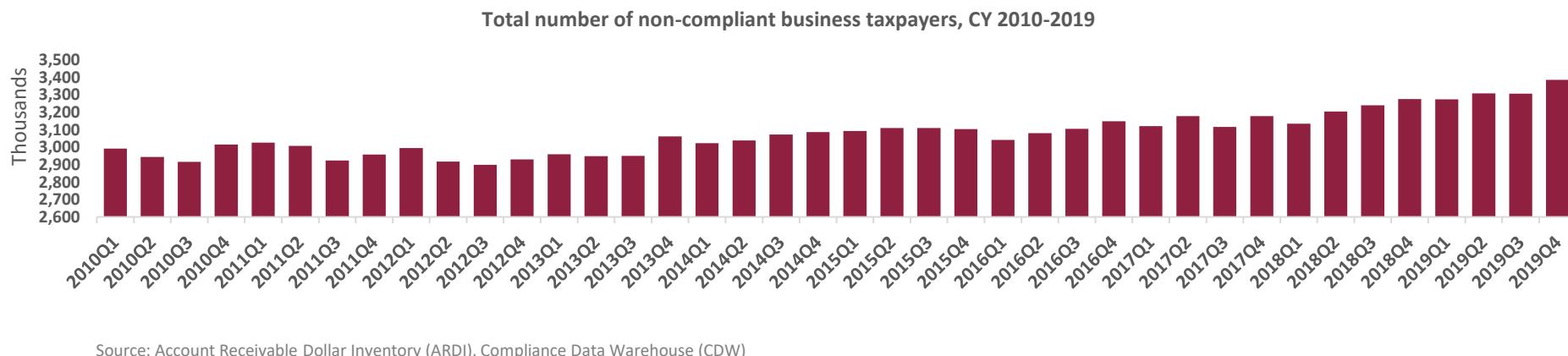


Businesses failing to meet their obligations to file and pay these taxes is a source of the tax gap

- Unpaid liabilities can grow quickly

The number of non-compliant business taxpayers grew 17.2% from 2010 to 2019.

- 2010: ~2.9 Million
- 2019: ~3.4 Million



Most previous tax literature looks at the direct and indirect effects of singular narrow programs:

- Field experiment on employer Federal Tax Deposit (FTD) Alert visits (Boning, et al., 2020)
- Automated Substitute for Return (Datta, et al, 2015)
- Notice of Federal Tax Lien filing (Turk, et al., 2016)

These studies find that enforcement deters tax evasion through both direct and indirect mechanisms.

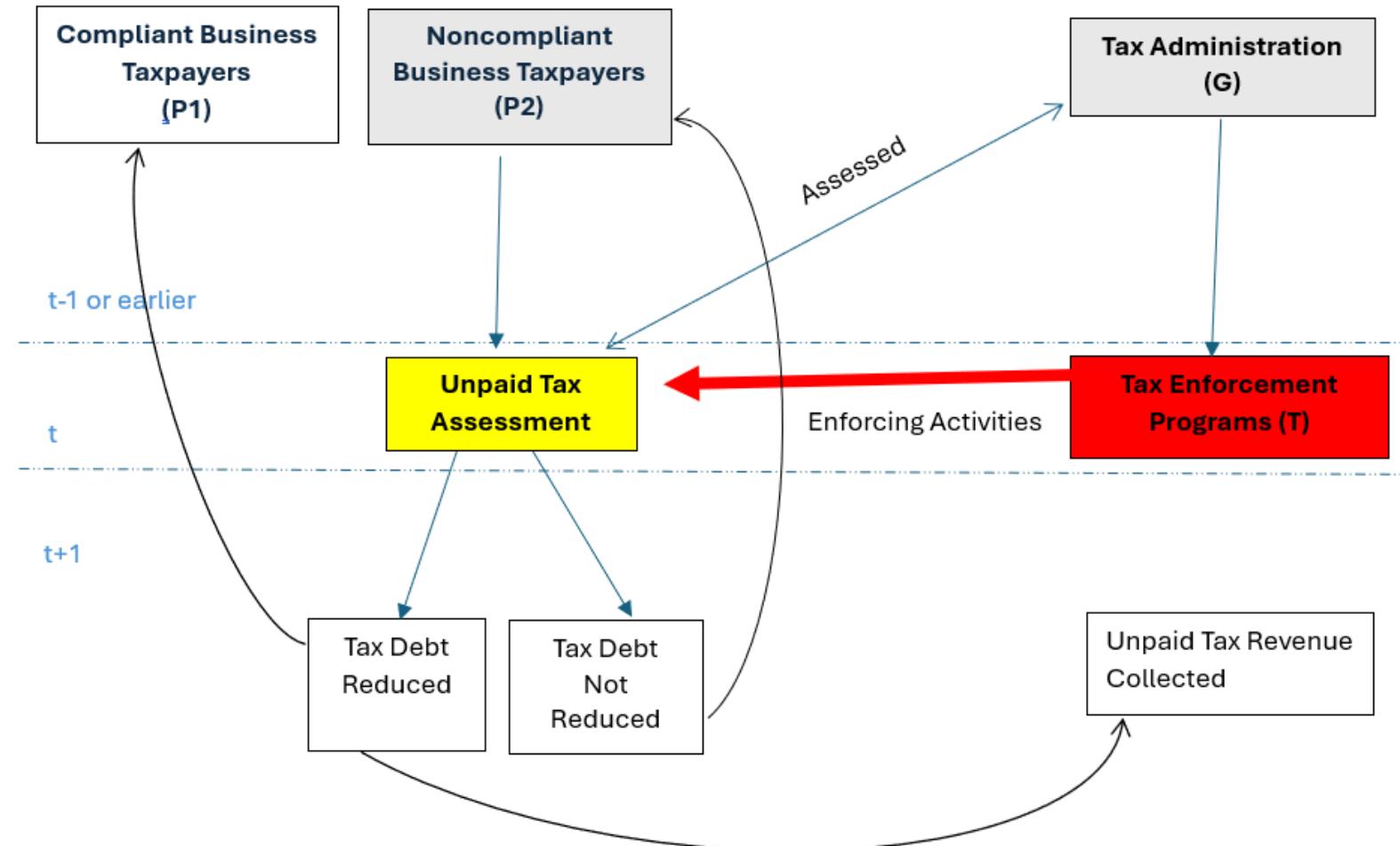
- **Direct impact** (changes in the behavior for the taxpayer that is treated)
- **Indirect impact** (changes in the behavior for the general population)

Objective

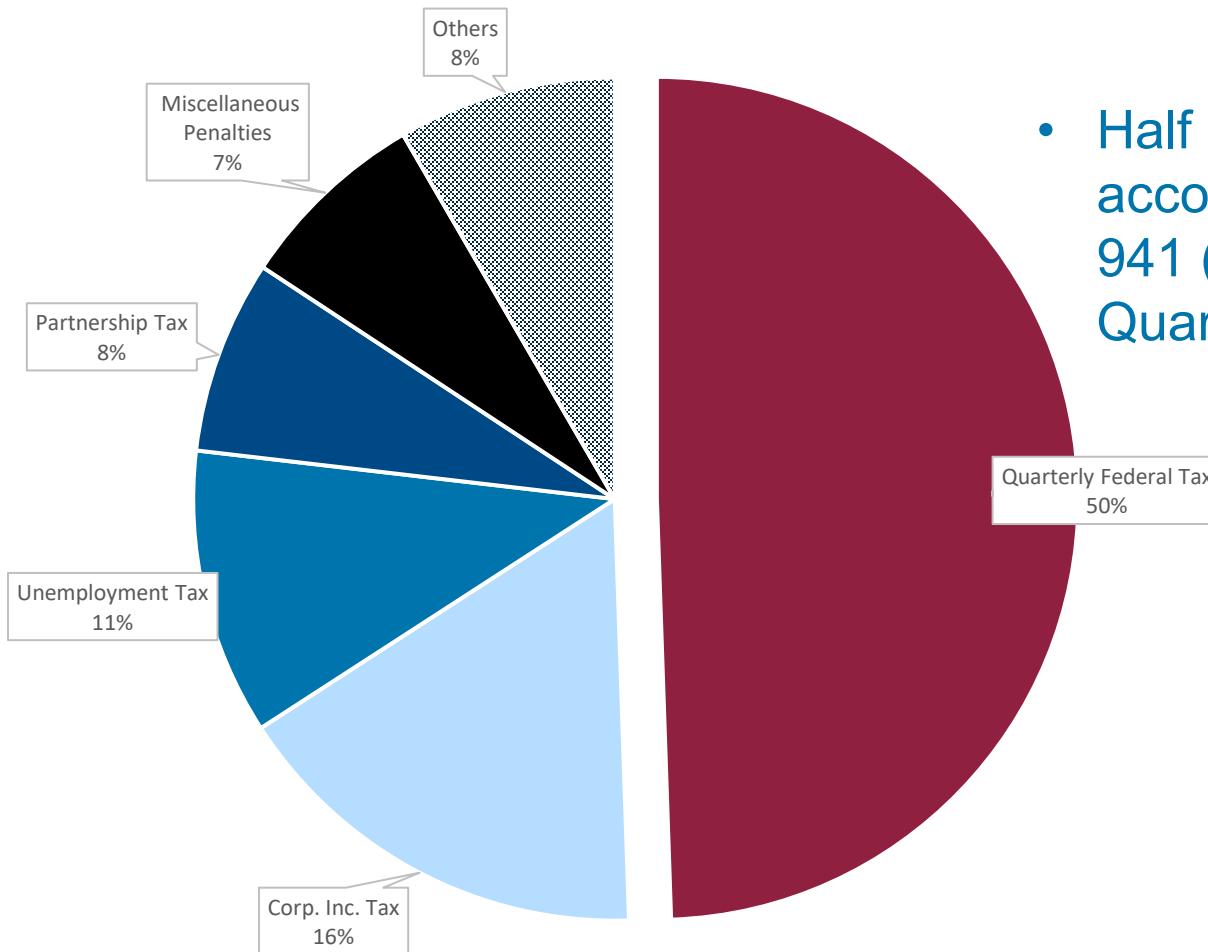
- Study both direct and indirect impacts of IRS's main filing and payment compliance programs on business taxpayers' payment compliance behavior

Approaches

- **Take advantage of a natural experiment**
- **Study several major intervention programs**
 - Delinquent non-filer contact (CP 259)
 - ACS post assessment letters (Letter 11 & 16)
 - In-person visits (field visits & FTD Alert visits)
 - Federal tax lien
- **Decade-long study period (similar to Collins et al., 2024)**
- **Use quarterly data to match employers reporting obligations**



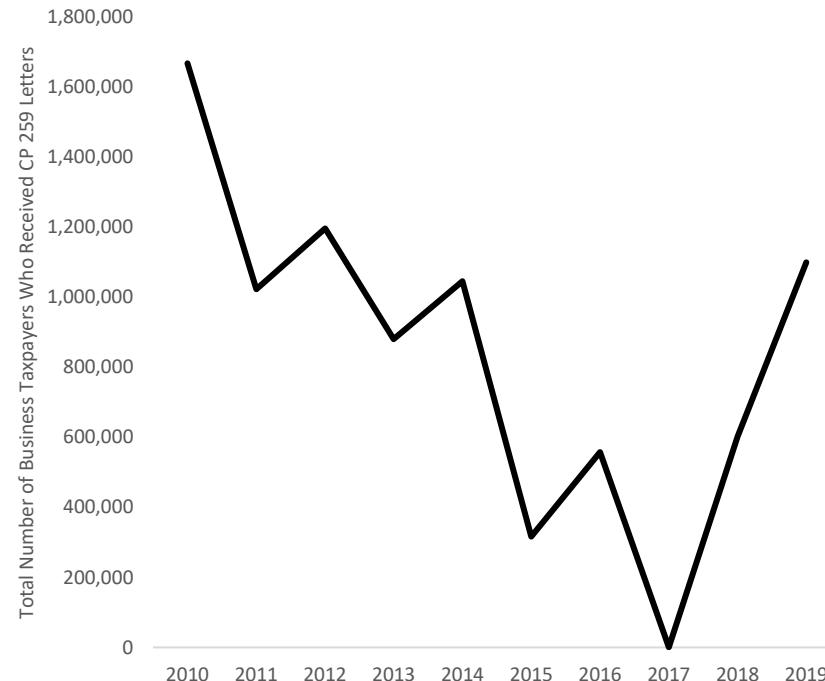
Delinquent Business Accounts (2019)



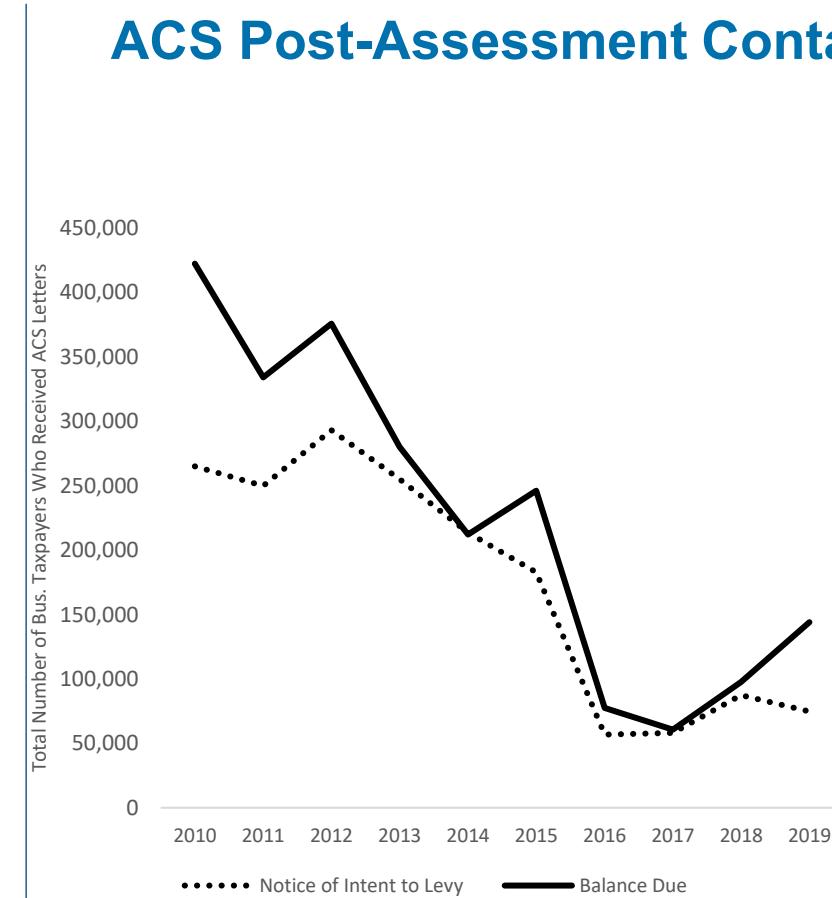
- Half of unpaid business accounts are from Form 941 (Employer's Federal Quarterly Tax Return)

Source: Account Receivable Dollar Inventory (ARDI), Compliance Data Warehouse (CDW)
Note: Graph is based on the total number of the accounts in ARDI in the last major cycle in CY 2019

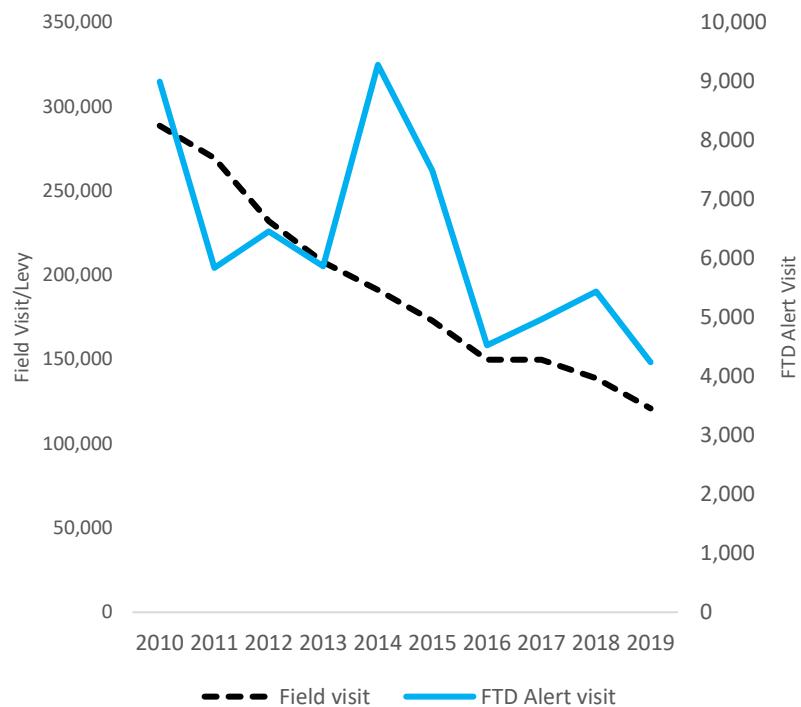
Delinquent Non-Filer Contacts



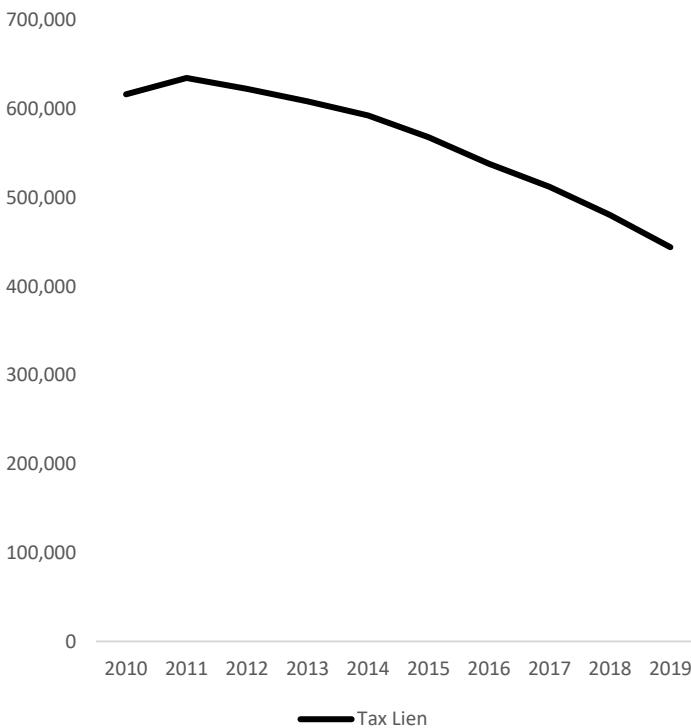
ACS Post-Assessment Contacts



In-Person Visits



Federal Tax Liens



Unpaid tax assessment database

- Business taxpayers
- CY 2010-2019
- 1% sample
- Joined with data for filing and payment compliance treatments

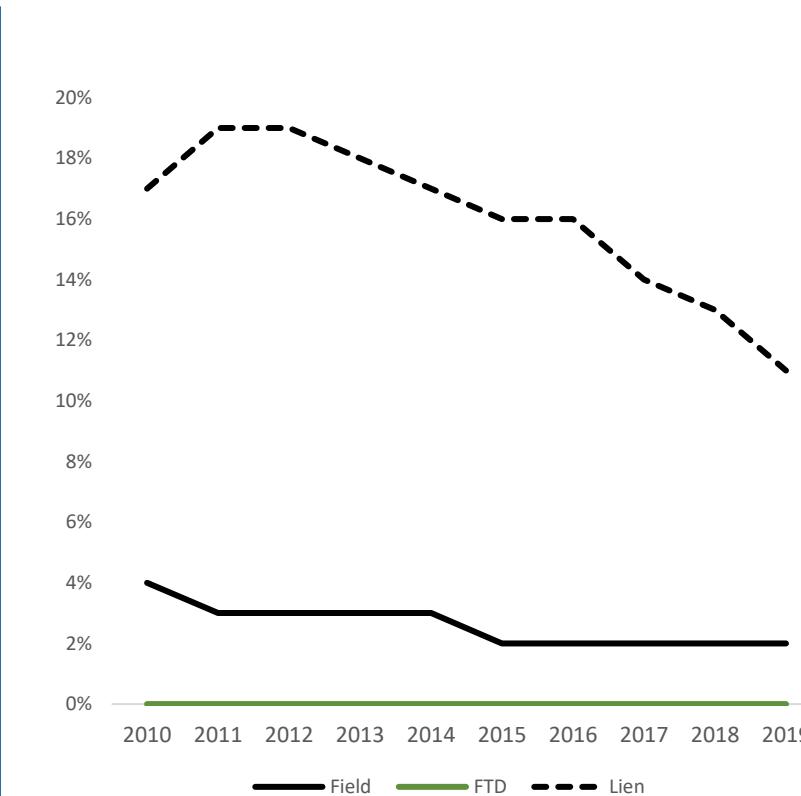
Total observations 1.2 Million

- Quarterly
- Entity level

Post-Notice Contacts



In-Person Visits and Federal Tax Liens



Dependent variable

- Resolution tax delinquencies during the current quarter

Independent variables

- Filing and payment compliance contacts (in prior quarter)
 - Non-filer contact (CP 259)
 - ACS letters (Letter 11 & 16)
 - In-person visits (field visits & FTD alert visits)
 - Federal tax lien
- Delinquency status (in prior quarter)
 - Total number of the default tax accounts
 - Number of the newly assessed accounts
 - Number of resolved accounts
 - Number of days being default
 - If late filer or non-filer
 - Other delinquent status (suspended, CNC, queued, etc.)
- Business age (in prior quarter)
- Major source of assessment (in prior quarter)
- Year trend
- Quarter fixed effects
- Industry sector
- Geographical location

$$\Delta y_{i,t,t+1} = \beta_0 + \beta X_{it} + \delta_1 t + \delta_2 T + \gamma D_{it} + U_{it}$$

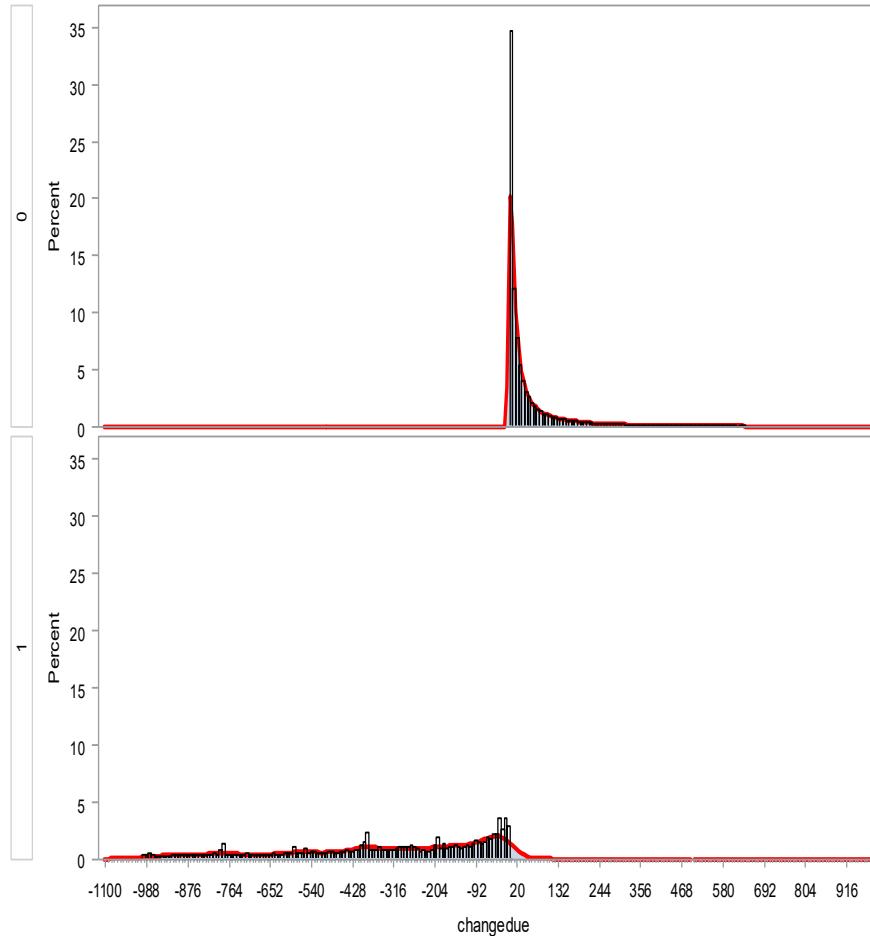
Where $\Delta y_{i,t,t+1}$ is the dependent variable

$$\Delta y_{i,t,t+1} = \frac{\text{Unpaid Tax Assessment}_{i,t+1} - \text{Unpaid Tax assessment}_{i,t}}{\text{Unpaid Tax Assessment}_{i,t}}$$

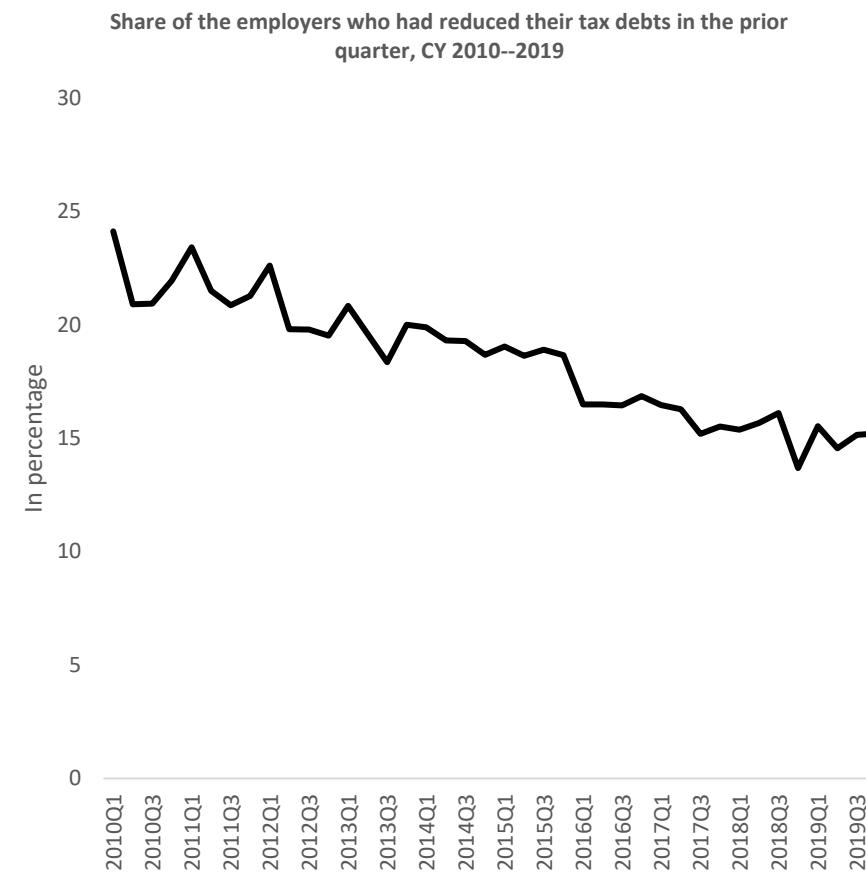
Linear Regression For Percentage Change in Unpaid Balance

Explanatory variable	Estimate	Standard Error	t Value	Pr > t
Intercept	-1.2712	0.3806	-3.34	0.0008
<u>Delinquency status</u>				
Total number of the default tax account	0.0151	0.0056	2.70	0.0069
Number of the newly assessed account	-0.0182	0.0010	-18.85	<.0001
Number of days being default	0.000029	0.000001	44.81	<.0001
Dummy of being default, =1 if >10 yrs, 0 otherwise	-0.0535	0.0038	-13.89	<.0001
<u>Business establishment</u>				
Business age	-0.0016	0.0001	-26.18	<.0001
<u>Default tax collection treatment</u>				
Delinquent non-filer contact	0.0876	0.0036	24.48	<.0001
Tax balance due notice	-0.0417	0.0043	-9.68	<.0001
Notice of Intent to levy	-0.0423	0.0046	-9.10	<.0001
Personal visit	0.1386	0.0039	35.90	<.0001
Federal tax lien	-0.0200	0.0019	-10.67	<.0001
Year trend	0.0005	0.0002	2.90	0.0037
Industry sector fixed effects	Yes			
Geographical location	Yes			
Quarterly fixed effects	Yes			
Observations	1,205,103			
F Value for the model	785.7			

Distribution of Change in Balance Due



% of Taxpayers Reducing Tax Debt, 2010-2019



The Linear Probability Model

$$Y_{i,t+1} = \alpha_0 + \alpha X_{it} + \tau_1 t + \tau_2 T + \varphi D_{it} + u_{it}$$

The Logistic Model

$$P_{i,t+1}(Y_{i,t+1} = 1 | X_{it} = x_{it}) = \frac{e^{\phi_0 + \sum_{j=1}^k \phi_j x_{it,j}}}{1 + e^{\phi_0 + \sum_{j=1}^k \phi_j x_{it,j}}}$$

Where

$Y_{i,t+1} = 1$ if the employer has reduced its tax debt, from quarter t to quarter $t+1$

$Y_{i,t+1} = 0$ if the employer has not reduced its tax debt during this period

Variable	<u>Linear Probability Model</u>		<u>Logistic</u>
	Slope	Marginal Effect	
<u>Default tax collection treatment</u>			
Delinquent non-filer contact	-0.005	0.007***	
Tax balance due notice	0.03***	0.03***	
Notice of Intent to levy	0.14***	0.09***	
Personal visit	0.04***	0.01***	
Federal tax lien	0.03***	0.06***	
Year Trend	- 0.001***	- 0.001***	

Note: *** Statistical significance at p-value = 0.001

Context:

- Filing and payment compliance contacts declined significantly between 2010 and 2019. This trend is used as a natural experiment to assess the effects of enforcement reductions.

Direct Enforcement Impacts:

- Enforcement actions targeting filing and payment compliance were effective in securing delinquent business tax payments.
- Notices with deterrence-focused messaging showed stronger impacts.

Indirect and Additional Factors:

- A negative compliance trend, reflected in the year trend variable, persists even after controlling for direct enforcement effects.
- This may reflect:
 - Indirect deterrence effects of main enforcement programs.
 - Direct impacts from reductions in other enforcement activities.

- **Investigate whether the remaining negative trend reflects indirect effects or reductions in other programs.**
 - Extend the analysis to jointly estimate direct and indirect effects.
- **Refine modeling of filing and payment behaviors to capture heterogeneous responses.**
- **Incorporate lagged treatments to reflect behavioral dynamics.**
- **Account for potential endogeneity and selection bias to strengthen the causal effect identification**



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INFLUENCING TAXPAYERS' BEHAVIOR: TAX REVENUE INCREASE FOLLOWING COMPLIANCE INITIATIVE

Authors:

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15th Annual IRS/TPC Joint Research Conference on Tax Administration
Washington, D.C - June 12th, 2025



MINISTÉRIO DA
FAZENDA



Disclaimers:

- 1) The views expressed in this paper do not necessarily reflect the institutional position of the Brazilian Federal Revenue Service.
- 2) We are not academic researchers. Rather, we are Tax Auditors trying to analyze the effects of our actions to improve future performance.

Context

- Challenge of reducing tax evasion with a declining workforce → Improve tax compliance by using automated auditing systems
- Small team → enhance tax compliance on a broad scale → significantly increasing the efficiency of the auditing process
- One of these initiatives was focused on the Simples Nacional tax regime

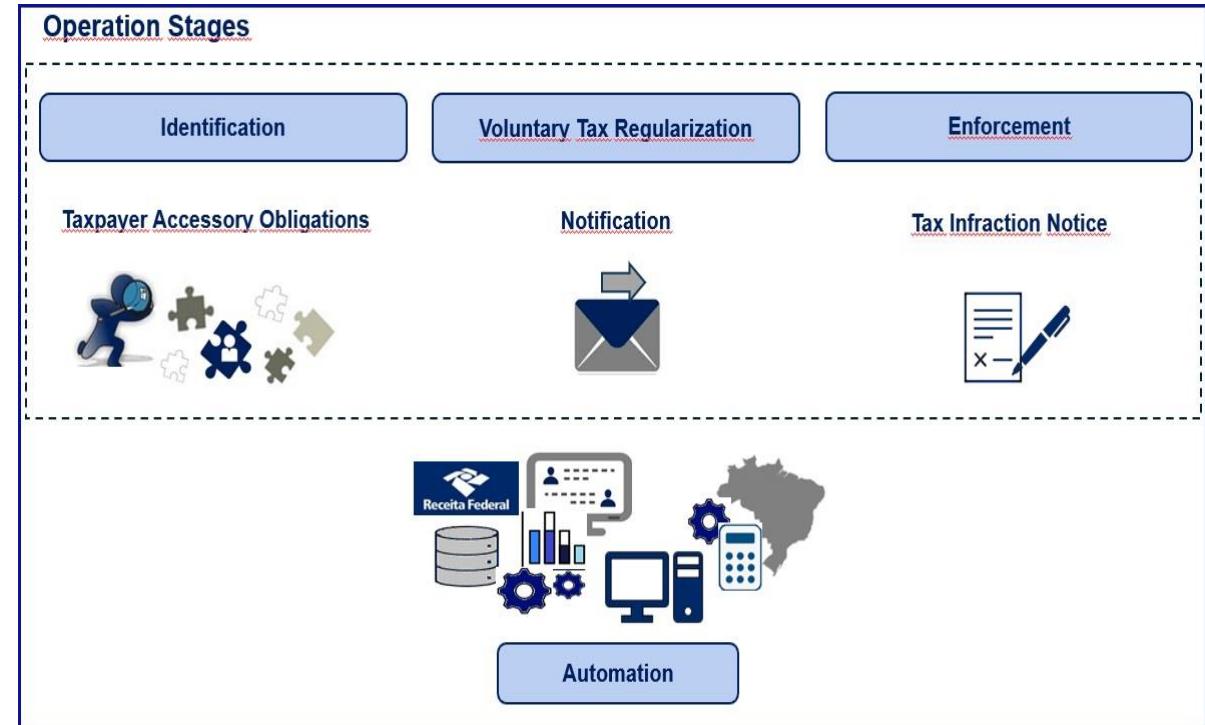
Simples Nacional Tax Regime



- Simplified taxation regime that consolidates the calculation and payment of federal, state, and municipal taxes for micro and small businesses with a maximum annual revenue of BRL 4.8 million (USD 844.000).
- Represents around 70% of the 10.4 million enterprises in Brazil, but only 5.8% of federal tax revenue
- From 2016 to 2019, an average of just 0.07% of Simples Nacional taxpayers were subjected to traditional audit processes related to Federal taxes.

The compliance initiative

- Launched in November 2020, targeting **commercial** enterprises in the Simples Nacional regime.
- Entirely based on electronic tax declarations and electronic invoices to identify discrepancies.
- Notification on the official Simples Nacional website to inform taxpayers and accounting professionals about the opportunity for regularization



Initiative Results

Direct Outcome:

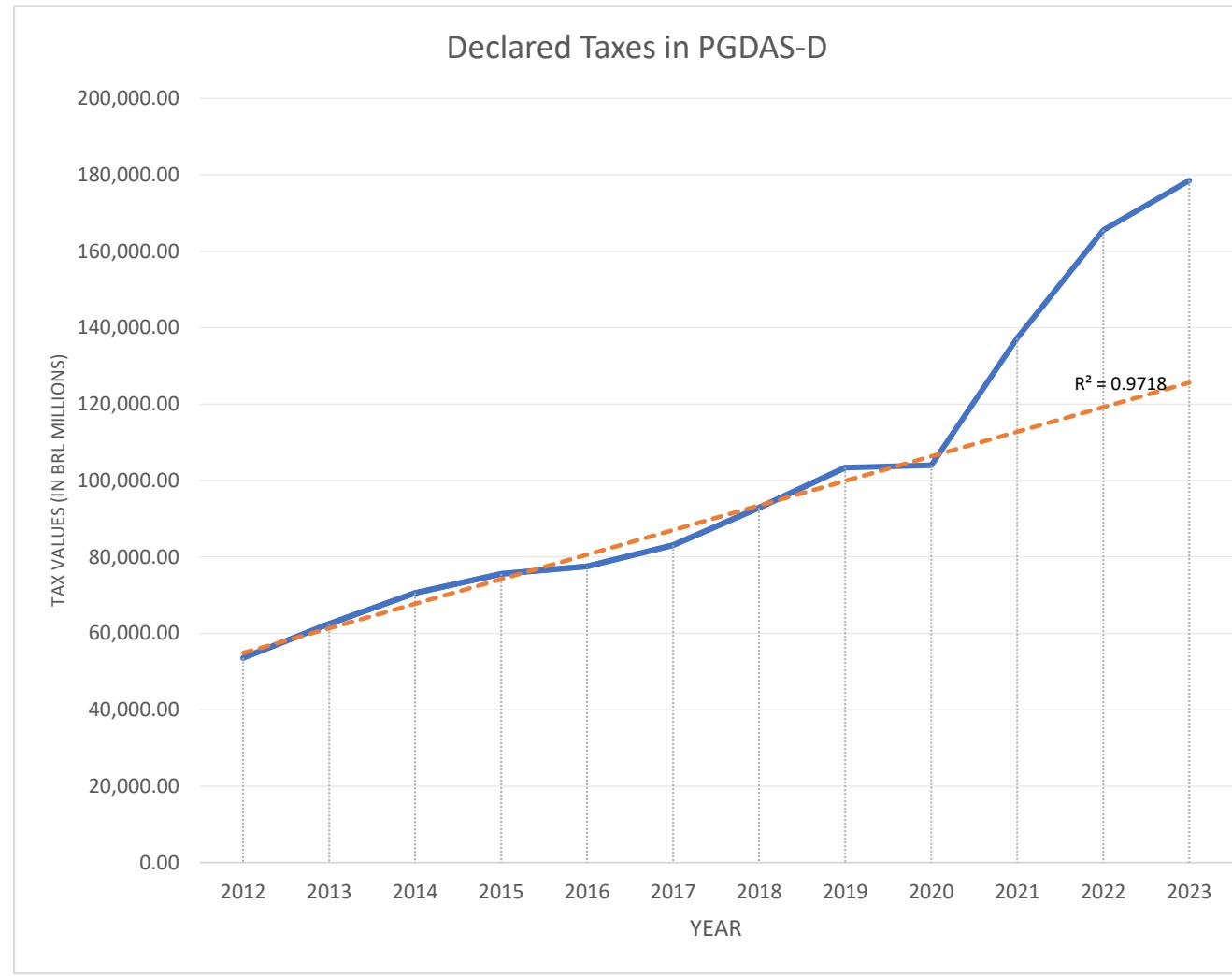
- Voluntary Tax Regularization Phase - nearly **33%** of the 26,000 notified enterprises **rectified their declarations** for the years 2018 and 2019, which resulted in an additional of approximately BRL 304 million (USD 56 million) in tax revenue.
- Enforcement phase - 9,056 audits resulted in approximately BRL 600 million (USD 116 million) in taxes, fines, and interest for late payment. → This is the least important result, as the primary objective of the initiative was to encourage voluntary tax compliance.

Initiative Results

Indirect Outcome:

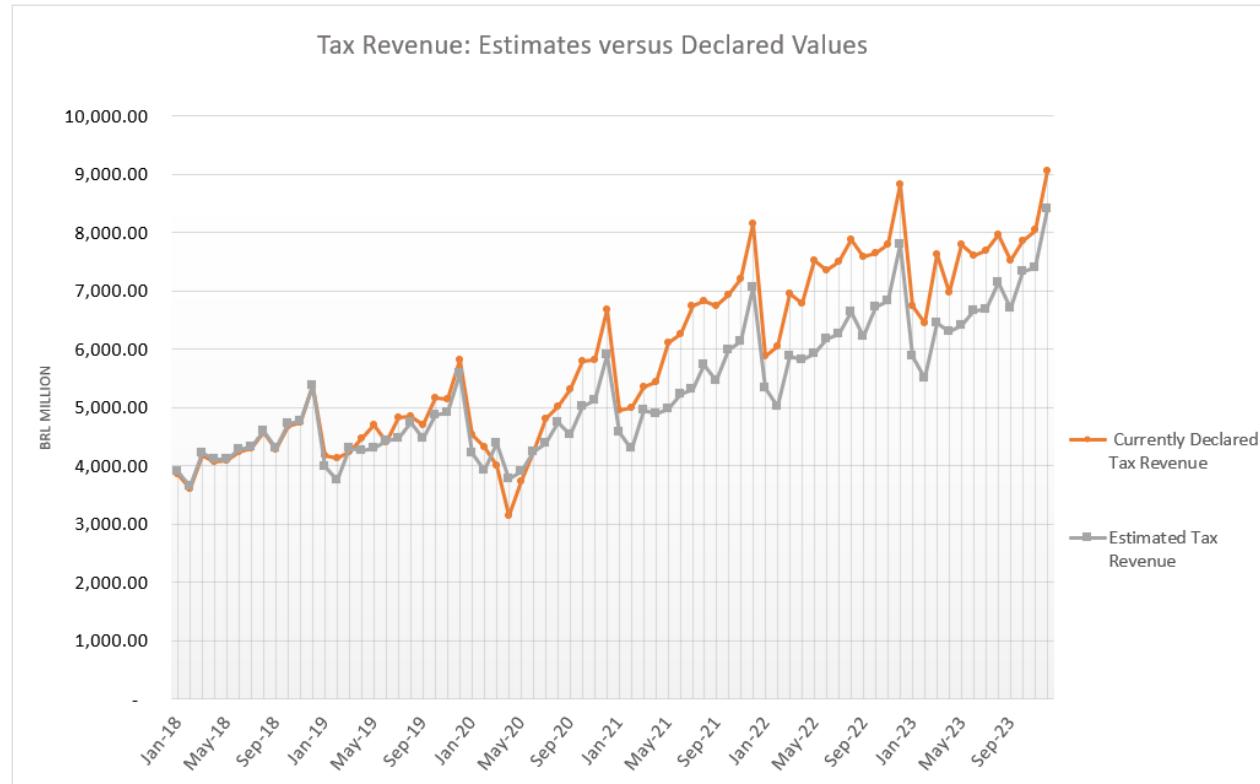
- Any indirect effect on voluntary compliance - the gap between the taxes paid by taxpayers as a result of an intervention and the tax they would have paid had the intervention not occurred.
- **This study focuses on the indirect outcome** -The indirect effects were monitored until 2023.

The study – Declared taxes



- From 2012, when the PGDAS-D started, to 2020, we found a mostly **stable trend line**.
- From 2021 onward, the graph reveals a **significant increase** in declared taxes.
- Since the direct results alone could not explain this increase, a series of analyses was conducted to evaluate the initiative's impact on taxpayer compliance behavior.

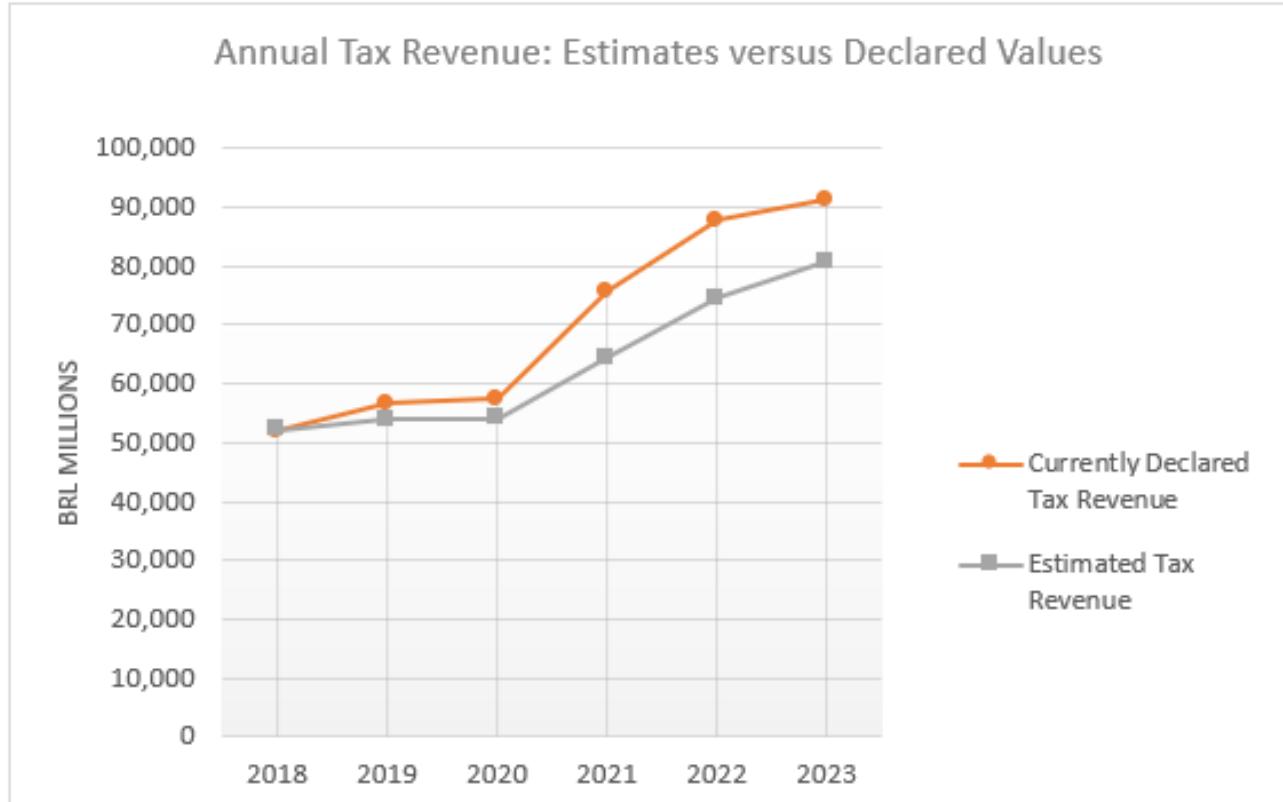
The study – monthly declared x expected



- **Orange line:** taxes **currently declared** in the PGDAS-D
- **Gray line:** the **expected growth**, based on the values declared for the year 2018, before the Voluntary Tax Regularization Phase, updated for **inflation** and adjusted for the **proportional increase in the number of taxpayers** opting for Simples Nacional

The study – annually declared x expected

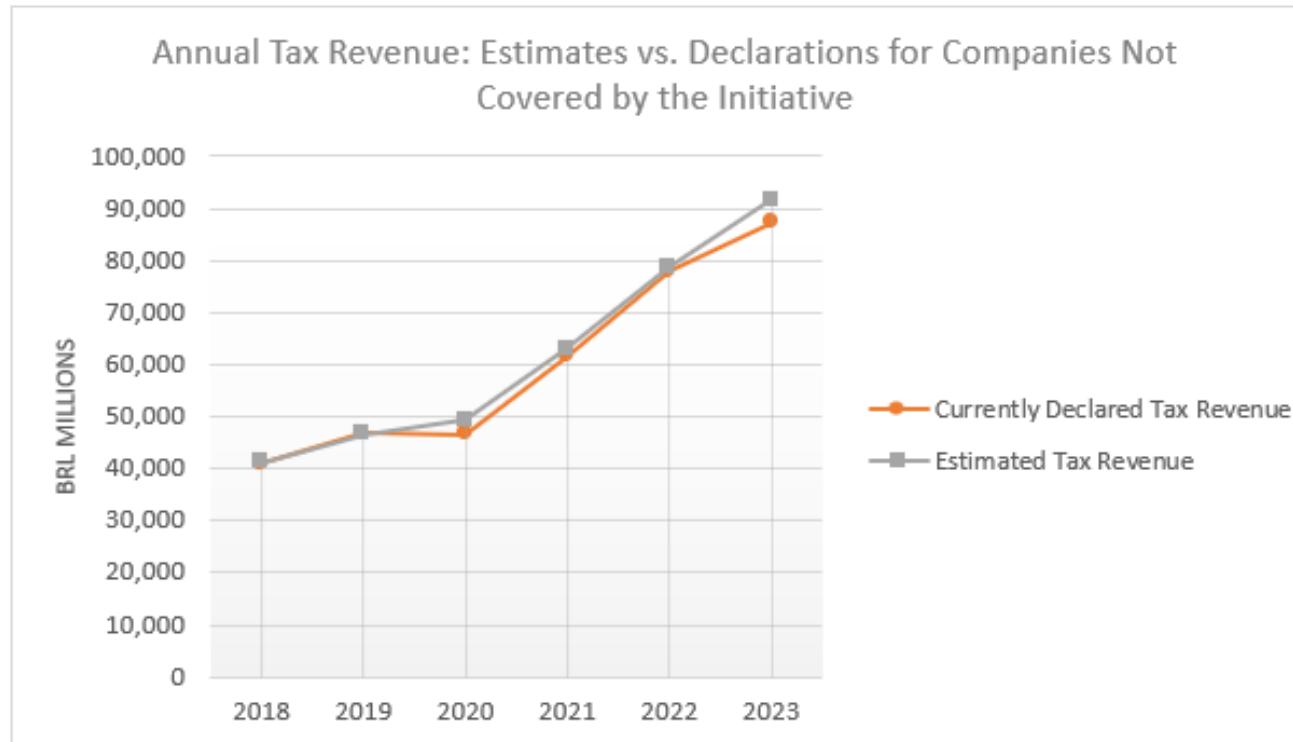
Activities targeted by the operation



- Between 2021 and 2023, the declared tax values **exceeded** the estimated declared **tax revenue** for the targeted business activities by over **BRL 34 billion** (USD 6 billion)

The study – activities not covered

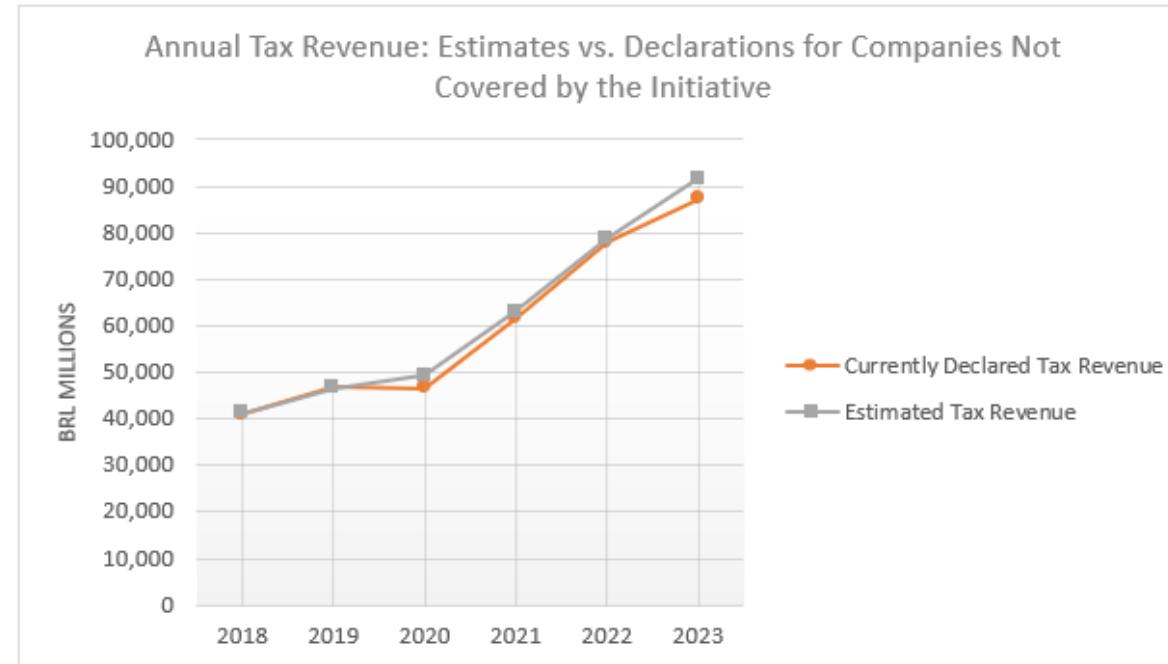
*Activities **not covered** by the operation*



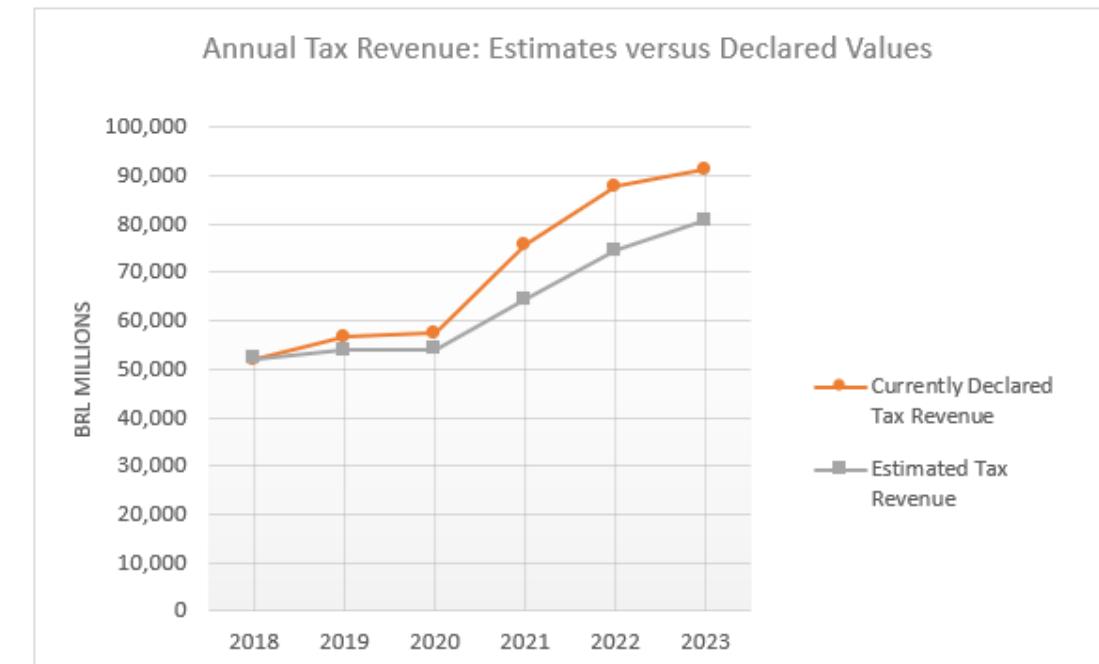
- Current tax revenue values **consistently aligned** with the established estimates

The study – Summary

*Activities **not covered** by the operation*



*Activities **targeted** by the operation*



Conclusions

- The study suggests that the initiative contributed to an increase in tax compliance - behavioral changes, indirect effects.
- Indirect effects - outsourced accountants, rapid dissemination of information.
- Enforcement phase - demonstrate the seriousness and credibility of the operation.
- Activities not covered - absence of change in tax behavior, operation target only commercial activities.
- Magnitude of the operation – 26,000 taxpayers, strengthens the findings

Question raised



If taxpayers begin to expect periodic enforcement, will they delay compliance until formal notification is received?

- Continuous monitoring.
- Future studies.
- At this point, we have only a few clues.

The end

Thank you for your attention!

Vinícius Oliveira - RFB



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PROGRAMA DE CONFORMIDADE
COOPERATIVA FISCAL DA RECEITA FEDERAL

Márcio Henrique Sales Parada
Patrícia Bacheschi Gomez de Lamadrid
Tax Auditors
Brazilian Federal Revenue Service



Theoretical basis - OECD

- 2008 – enhanced relationship – pillars: understanding and respect, transparency, disclosure, responsiveness and mutual trust
- 2013 – cooperative compliance:
 - Early engagement
 - Real-time resolution of tax issues
 - Mutual benefits
 - Importance of governance and risk-management (Tax Control Framework)
 - Role of senior management
 - Transparency and trust as cornerstones
 - Tailored approaches



Confia's objectives

- Tailor OECD's cooperative compliance model to the Brazilian context
- Provide legal certainty by offering taxpayers interpretations and administrative positions quickly and timely to prevent litigation



Brazilian context

- Tax laws and regulations
- Ancillary tax obligations: information x cost
- Low level of trust
- Data cross-referencing, automation, audit specialization
- Litigation
- Digital services: efficiency x resolution
- Vertical management structure



Governance



Steering Committee

RFB senior management

Defines guidelines

Decides about proposals



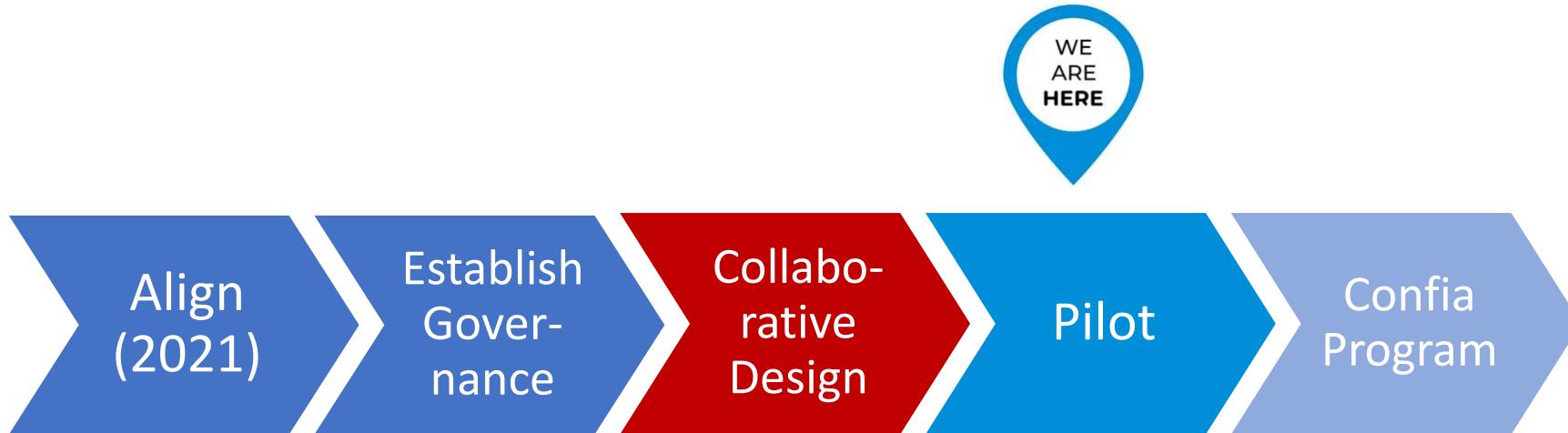
Dialogue Forum

Target audience: 40 LB +
3 industry associations

Studies, analyses, discusses

Proposes CCP solutions

Stages of development



Procedures Testing



Focal Point of Contact

Cooperative Renewal of the Debt Clearance Certificate

Collaborative Review of Fiscal Issues

Use of the Confia Brand

Priority Access to the Definitive Program

9 voluntary companies from the Dialogue Forum

Criteria and principle of equality



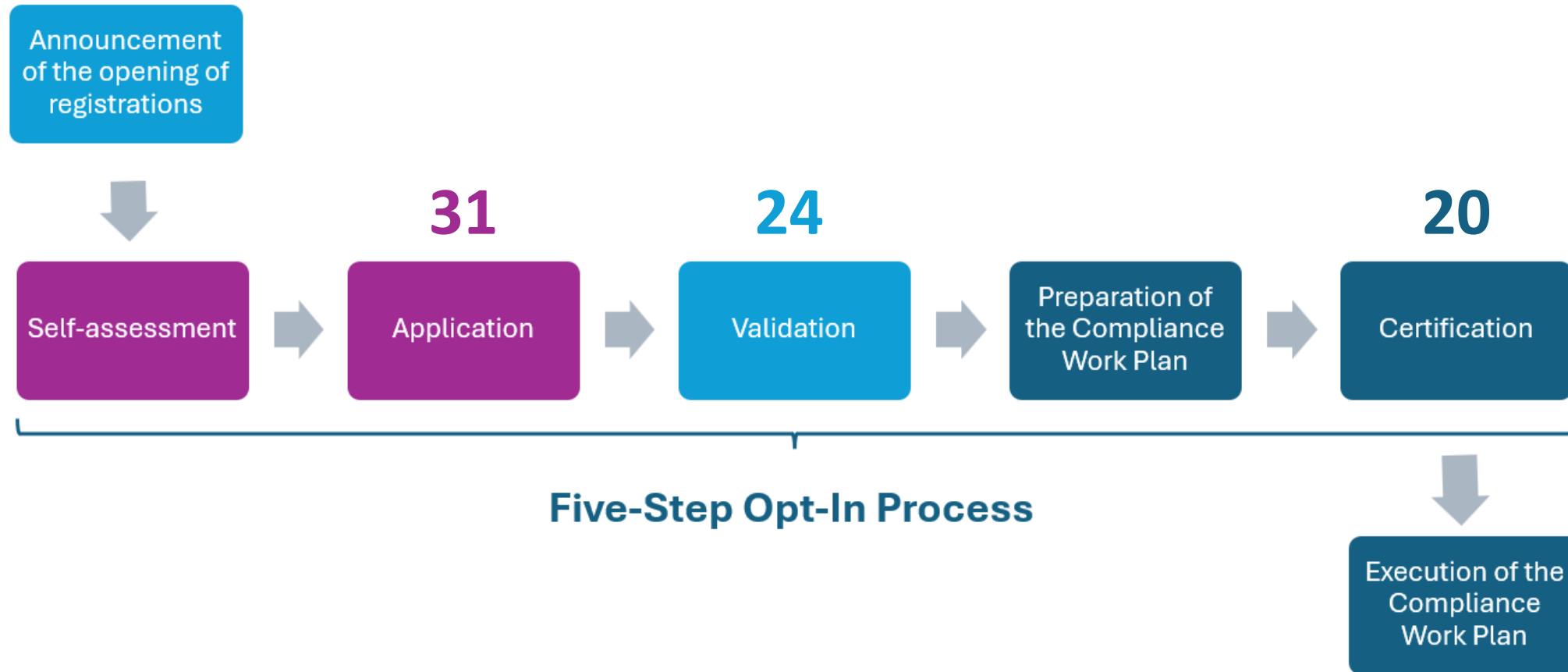
Quantitative Criteria

- Gross revenue \geq USD 360 Million
- Tax due \geq USD 18 Million
- Total debts in litigation $<$ 30% of the total assets or total gross revenue

Qualitative Criteria

- Registry = OK
- Debt Clearance Certificate = OK
- Large Business Unit
- External independent audit
- Tax Control Framework
- Good tax compliance record
- Agree to the Term of Commitment

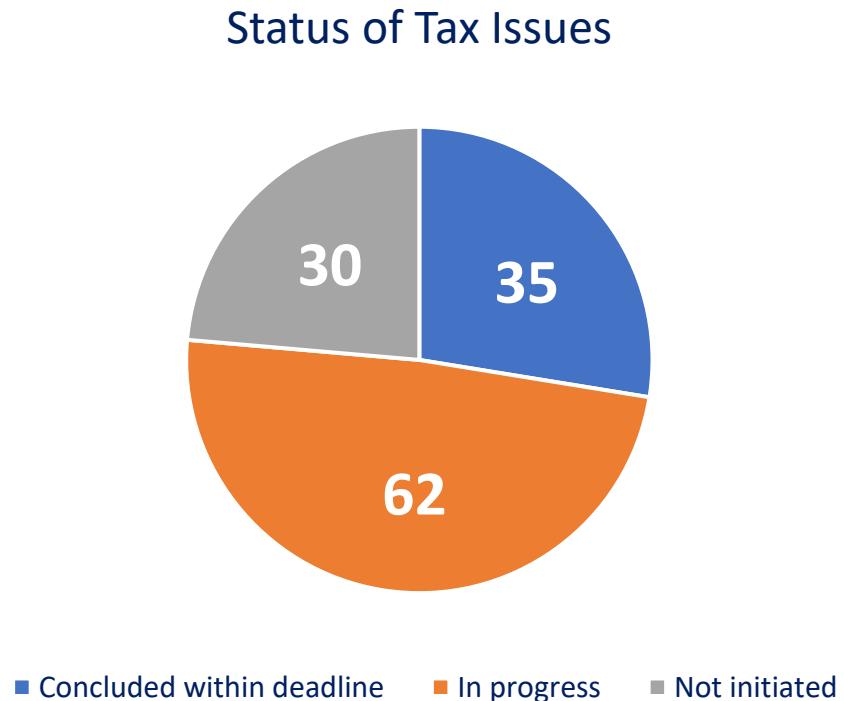
Confia Pilot implementation steps



Compliance Work Plans



Provide predictability to taxpayers about the relevant tax issues that the tax administration intends to work on concerning each of the candidate companies during a predetermined period



Measuring costs and benefits

Three pillars

- There are no one-size-fits-all formulas
- Costs and benefits should be evaluated comparatively
- Benefits of transparency and dialogue



Benefits of the Confia pilot



1. Controversial topics: institutional positions, clear guidance and improvement of legislation.
2. Regularization of non-compliances: collections and savings in penalties
3. Legislative changes: real-time work to apply (e.g. TP)
4. Easy collaborative renewals of Debt Clearance Certificates
5. Process improvement: RFB's services and taxpayers' governance
6. Communication: access and dialogue

Costs of the Confia pilot

- Providing predictability and building trust
- Cultural change
- Adapting the regulatory framework – political cost



Parameters to measure costs and benefits



- Compliance behaviour evolution
- Risk management
- Institutional improvement
- Litigation management
- Tax certainty



Measurable Indices ?

Tax Control Framework



ISO 37301:2021 Compliance management systems — Requirements with guidance for use

ABNT* NBR Tax Compliance Management Systems — Requirements with guidance for use (under cooperative development)

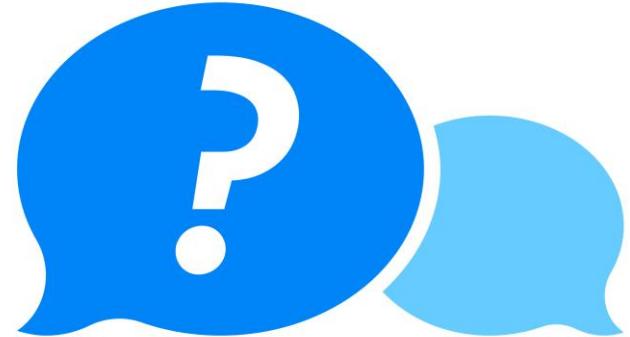
Possible uses:

- Self-assessment
- Certification by the RFB
- Certification by an accredited third party

* Brazilian Association of Technical Standards



Doubts?



confia@rfb.gov.br

Want to know
Confia's latest
news?





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FISCAL AFFAIRS

Discussion: Improving Business Compliance: Lessons from Brazil and the US

JUNE 12, 2025

Li Liu

“The views expressed in this presentation are of the authors and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.”

Main takeaways

- Stronger enforcement improves compliance for businesses taxpayers (Turk et al 2025)
- With sustained tax revenue increases for those directly and indirectly affected (Matsumoto et al 2025)
- Cooperative compliance programs also have the potential to improve the quality of tax administration (Campos et al 2025)

Turk et al 2025

- Establishing causation beyond correlation
 - To comply, or not to comply...
 - Cross section, or panel
 - Teasing out the effect of shrinking IRS resources
- Understanding the overall impact of enforcement programs
 - Extensive + inclusive margin (PPML)
 - Identifying the most cost-effective measure

Matsumoto et al 2025

- Scale of spillovers?
 - Separate projection for taxpayers who did not receive the notification, within the targeted sectors
 - And look into the different channels of spillovers
- If the goal is to increase tax revenue,
 - While administration became more challenging with the expansion of Simples...
 - Improving enforcement, or policy?

Matsumoto et al 2025

Substantial revenue forgone from ‘Simples’

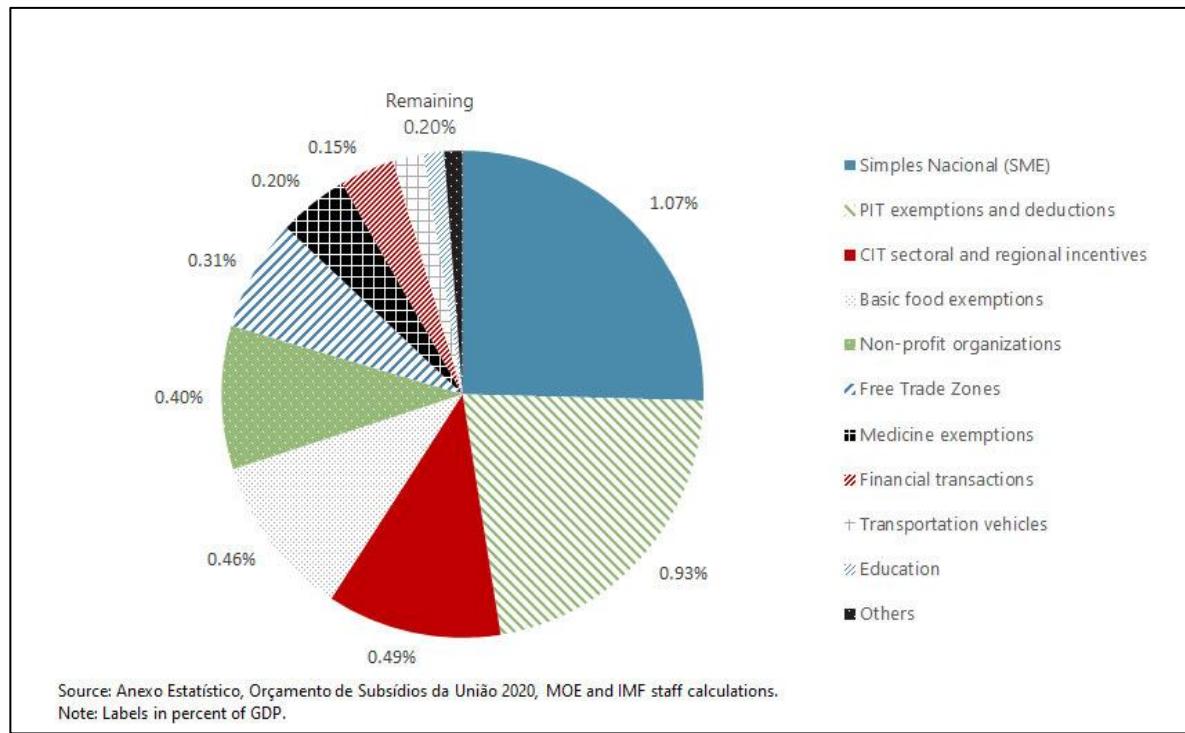


Table 1. Brazil and Comparators: Simplified Tax Regimes for SMEs

Country	Tax rate over turnover	Maximum participation threshold (turnover, USD)
Argentina	Fixed amount (max 6.55)	600,000
Armenia	5 (trading), 3.5 (production)	122,400
Bolivia	5	36,221
Brazil	4 – 33 (progressive rates)	951,928
China	4	154,567
Colombia	2 - 14.5 (progressive and sector specific)	775,668
Costa Rica	3 - 9	108,369
Ecuador	0.43 - 5.21	60,000
France	1.7 (ind./comm.), 2.2 (non-comm.)	94,400
Indonesia	1	331,200
India	2 (general) 12.5 (professional services)	269,701
Italy	6 (food), 11.7 (professionals)	77,441
Mexico	Graduated tax discount up to 10 years	97,180
Nicaragua	max 5.5	34,358
Peru	0.4 - 0.63 (fixed amount)	24,508
Portugal	3.15 (retail) - 16 (professional services)	238,238
Russia	4 (B2C sales), 6 (B2B sales)	2,061,000
South Africa	max 3	70,250
Uruguay	max 3.5	34,543

Campos et al 2025

- Lots to like about Confia pilot
- What's the catch?
 - Limiting the authority of revenue administration
 - Governance issue
 - Feasibility of extending to sub-national level
- Toward the full program:
 - More like the Spanish model
 - Addressing structural weakness in litigation



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Tax Simplification



Tax Simplification

Is it possible?

Through the eyes of a
taxpayer / tax administrator

There may be other considerations for a tax, but

What Are The Characteristics of a Simple Tax?

I've identified **6 characteristics** based on:

- Over 50 years as a taxpayer
- Almost 40 years in tax administration research
- At least 40 years of listening to regular taxpayers

1. A Simple Tax Must Be Straightforward

A truly simple tax would:

- Be easy to **understand**;
- Be easy to **calculate**;
- Be straightforward to **administer**;
- Make it easy for most people to **meet their tax obligation exactly in real time**; and therefore
- Cost most taxpayers **NO additional money** and very little **time** to meet their tax obligation.

2. A Simple Tax Must Be Based on Individual Income

- All recurring taxes are ultimately paid from people's incomes and should be directly and clearly imposed on that income.
- All taxpayers would be voters (who know how much tax is imposed on them) and would keep their elected representatives (who impose the tax) accountable.
- We say a tax is progressive or regressive relative to individual *income*.
- Ever since the 16th Amendment was added to the U.S. Constitution in 1913, we've gotten used to a personal income tax.

3. A Simple Tax Must Be Manageable

- The tax authority needs to be able to **administer** it.

Counter example: corporation income tax

- Taxpayers need to know **how much** tax they're paying.

Counter examples: corporation income tax, property & sales taxes

- Tax authority must verify eligibility for tax benefits without taxpayers needing to **reveal private information**.

Counter examples: claiming offsets to income or offsets to tax

4. A Simple Tax Must Be Permanent

- Not changing every year
- It must be **stable** and predictable.
- A moving target **frustrates** everyone.
- The **costs** of change & uncertainty are high.

5. A Simple Tax Must Be Limited

- Limited in its **capacity to generate revenue**
 - Simple for taxpayers should not mean easy to raise taxes.
 - Making the tax completely visible to the voters who pay it will help.
 - Having just one tax bracket would help to moderate the rate.
- Limited in its **capacity to manipulate behavior**
 - Incentives and disincentives greatly complicate a tax.
- Limited in its **capacity to collect personal information**
 - Income offsets and tax offsets are the biggest culprits.

6. A Simple Tax Must Be Equitable

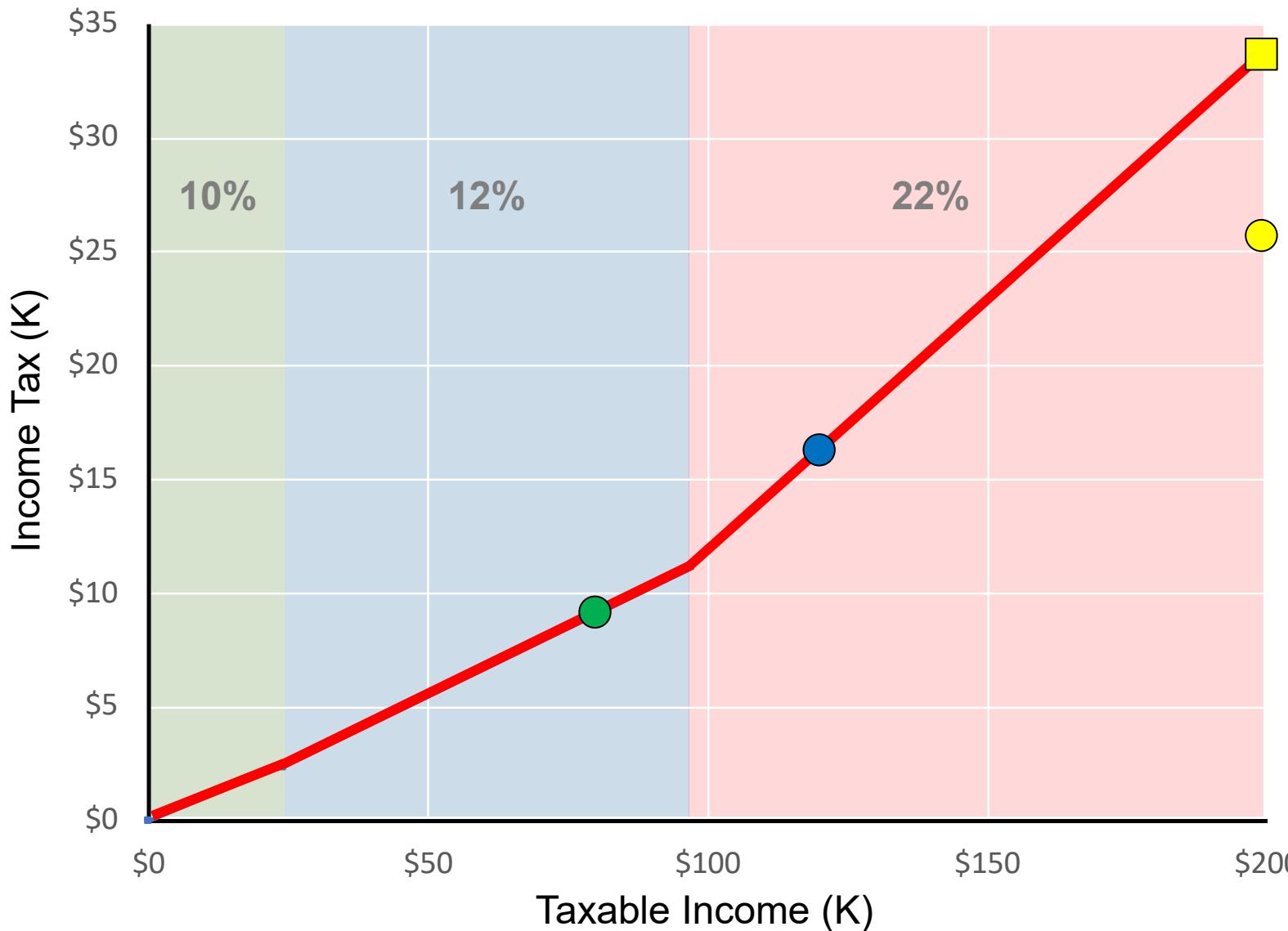
- Everyone must be treated **equally** (fairly).
 - Inequities undermine both simplicity and voluntary compliance.
- Every dollar of income should bear the **same tax rate**.
 - No exemptions, adjustments or deductions to reduce taxable income and no tax credits to reduce tax
 - No graduated tax rate structure
 - Neither progressive nor regressive
 - For most people, it would be like our current Medicare tax (except that applies only to earned income)

Do Progressive Tax Rates Really Cause Complexity?

- **Yes.** Imagine a tax system that deviated from these principles only due to a progressive tax rate structure.
- Examples of complexity:
 - Someone with **2⁺ sources of income** (another job, pension, investment income, etc.): paying tax at the source depends on knowing the income from other sources, which requires tradeoffs between **accuracy, simplicity, and privacy**.

Withholding Tax From 2 Concurrent Jobs

2025 Tax Rate Schedule - Singles



The withholding system treats each job as if it were the only job.

Job 1

Income \$120K

Tax withheld \$16,228

The second job should have been withheld at the marginal rate of the first job.

The employee(s) need to make an adjustment to their withholding.

2025 Form W-4

Step 2: Multiple Jobs or Spouse Works

Complete this step if you (1) hold more than one job at a time, or (2) are married filing jointly and your spouse also works. The correct amount of withholding depends on income earned from all of these jobs.

Do **only one** of the following.

- (a) Use the estimator at www.irs.gov/W4App for the most accurate withholding for this step (and Steps 3–4). If you or your spouse have self-employment income, use this option; **or**
- (b) Use the Multiple Jobs Worksheet on page 3 and enter the result in Step 4(c) below; **or**
- (c) If there are only two jobs total, you may check this box. Do the same on Form W-4 for the other job. This option is generally more accurate than (b) if pay at the lower paying job is more than half of the pay at the higher paying job. Otherwise, (b) is more accurate

Complete Steps 3–4(b) on Form W-4 for only ONE of these jobs. Leave those steps blank for the other jobs. (Your withholding will be most accurate if you complete Steps 3–4(b) on the Form W-4 for the highest paying job.)

Step 3: Claim Dependent and Other Credits	If your total income will be \$200,000 or less (\$400,000 or less if married filing jointly): Multiply the number of qualifying children under age 17 by \$2,000 <input type="text"/> Multiply the number of other dependents by \$500 <input type="text"/> Add the amounts above for qualifying children and other dependents. You may add to this the amount of any other credits. Enter the total here <input type="text"/>	3 <input type="text"/>
Step 4 (optional): Other Adjustments	(a) Other income (not from jobs). If you want tax withheld for other income you expect this year that won't have withholding, enter the amount of other income here. This may include interest, dividends, and retirement income <input type="text"/>	4(a) <input type="text"/>
	(b) Deductions. If you expect to claim deductions other than the standard deduction and want to reduce your withholding, use the Deductions Worksheet on page 3 and enter the result here <input type="text"/>	4(b) <input type="text"/>
	(c) Extra withholding. Enter any additional tax you want withheld each pay period <input type="text"/>	4(c) <input type="text"/>

Does a Progressive Tax Rate Really Cause Complexity?

- **Yes.** Imagine a tax system that deviated from these principles only due to a progressive tax rate.
- Examples of complexity:
 - Someone with **2⁺ sources of income** (another job, pension, investment income, etc.)—paying tax at the source depends on knowing the income from other sources, which requires tradeoffs between **accuracy, simplicity, and privacy**.
 - Withholding tax from **sequential or part-year jobs**
 - Graduated marginal rate brackets generate **incentive to understate income**—particularly near bracket thresholds.
- Same problems with a standard deduction & a “flat” rate

- **The rationale:**
 - Those with higher incomes have the **ability to pay** a higher % of their income.
 - The poor have virtually no **ability to pay**.
- **“From each according to his ability, to each according to his need.”**
 - Basic tenant of **socialism** is now enshrined in U.S. tax law.
 - **Problem:** **government decides** your abilities and needs.
 - **Problem:** government redistribution of income **undermines personal responsibility** of both the recipients and the donors (e.g., discerning and alleviating the root problems).

Vertical “Equity”

*“The subjects of every state ought to contribute toward the support of government, as nearly as possible, in proportion to their respective abilities; that is, **in proportion to the revenue which they respectively enjoy under the protection of the state.**”* — Adam Smith

*“The moment you abandon... the cardinal principle of exacting from all individuals **the same proportion of their income** or their property, you are at sea without rudder or compass, and there is no amount of injustice or folly you may not commit.”* — John Ramsay McCulloch

*“I do not believe that the government should ask social legislation in the guise of taxation. If we are to adopt **socialism**, it should be presented to the people of this country as socialism and not **under the guise of a law to collect revenue.**”* — Calvin Coolidge

What Would a SIMPLE Tax Look Like?

Characteristic	How?
Straightforward	Withhold exactly at source; 3 rd -party information reporting; everyone treated the same
Income-Based	All realized personal income, net of expenses incurred to generate business income (no other taxes)
Manageable	No indirect taxes; no offsets to income or tax; ignore losses
Permanent	Constitutional Amendment specifying the tax base, allowing Congress to change: (1) the tax rate by normal procedures; and (2) the definition of net income , but only by supermajority of both houses
Limited	
Equitable	Every dollar of income subject to the same tax rate

Practical Considerations

- Can't be implemented piecemeal.
- Must be by popular demand.
- What about “winners” and “losers”?

At the very least, I hope I've caused you to think objectively about why and how to make taxes simpler.

Questions?



**Research, Applied
Analytics & Statistics**



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