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Beyond Tax Rates:

Institutions, Capital Mobility, and the Residual Tax Gap

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Presentation Overview

01 **Research Context & Motivation**
Why measuring the residual tax gap matters

02 **Conceptual Framework**
Definition, dimensions, and prior literature

03 **Empirical Strategy**
Two-stage methodology and data

04 **Stage 1 – Tax Capacity Model**
Benchmark fiscal revenues (1990–2024 panel)

05 **Stage 2 – Residual Determinants**
Fixed-effects regression results

06 **Territorial & Temporal Analysis**
Cross-country and dynamic patterns

07 **Conclusions & Policy Implications**
Key findings and research agenda

01 Research Context & Motivation

Capital Mobility

Rising FDI, portfolio flows, and multinational profit shifting constrain national fiscal capacities globally.

Institutional Heterogeneity

Vast differences in governance quality, enforcement capacity, and regulatory frameworks across countries.

Measurement Gap

Standard tax gap measures conflate cyclical fluctuations with structural underperformance.

Policy Urgency

OECD BEPS framework, Pillar Two Global Minimum Tax signal growing demand for cross-country analysis.

This study employs a two-stage empirical framework to estimate the residual tax gap and identify its key determinants across countries, focusing on the share of tax revenue variation unexplained by standard macroeconomic fundamentals, particularly the roles of institutional quality and financial globalization.

02 Conceptual Framework: What is the Tax Gap?

Tax Gap = Actually Collected Tax Revenue – Theoretical Tax Revenue (under full compliance)

Tax Policy Gap

- Revenue lost via deliberate legislative choices
- Exemptions, preferential regimes, deductions
- Narrowing of the statutory tax base

Tax Compliance Gap

- Shortfall between statutory liability & actual payment
- Underreporting, non-filing, admin inefficiencies
- Aggressive tax planning & cross-border profit shifting

Residual Tax Gap = deviation of observed tax revenues from levels predicted by economic fundamentals — isolates institutional, structural, and cross-border drivers beyond standard macroeconomic controls.

2 Literature: Key Findings & Research Gap

This study contributes by shifting the analytical focus from conventional tax effort estimation (i.e., tax capacity levels) to the determinants of deviations captured by the residual tax gap, offering a novel methodological perspective with important implications for fiscal policy.

Gupta (2007)

GDP, trade openness, agriculture share & corruption shape revenue; income/profit taxes outperform consumption taxes.

Fenochietto & Pessino (2013)

Institutional quality & governance significantly enhance revenue potential; informal economy erodes tax bases.

Besley & Persson (2009, 2014)

Fiscal capacity is an outcome of cumulative institutional investment; political stability drives capacity building.

Tanzi (1992)

Structural factors (sector composition, trade openness) constrain revenue in developing economies.

OECD BEPS / Pillar Two (2023–2025)

Multilateral coordination can contain base erosion; coordinated reforms narrow fiscal gaps.

Research Gap: Limited coverage, short horizons, no residual-based measure across a 35-year global panel.

03 Empirical Strategy: Two-Stage Framework

Stage 1: Tax Capacity Estimation

- ✓ Global panel 1990–2024
- ✓ Time FE only (no country FE)
- ✓ Dependent: TAXREV_GDP
- ✓ Output: Predicted tax revenues (benchmark)

Stage 2: Residual Determinants

- ✓ Fixed-effects panel (country + time FE)
- ✓ Clustered std. errors (country level)
- ✓ Dependent: Residual Tax Gap
- ✓ Output: Drivers of fiscal deviation

Tax Capacity Estimation: $TAXREV\_GDP_{it} = \alpha + \beta' X_{it} + \lambda_t + \varepsilon_{it}$

Residual: ResidTaxGap = Observed TAXREV_GDP − Predicted TAXREV_GDP

Residual determinants: $ResidTaxGap_{it} = \alpha_i + \beta_1 Macroeconomic_{it} + \beta_2 Structural_{it} + \beta_3 Fiscal_{it} + \beta_4 Institutional_{it} + \lambda_t + \varepsilon_{it}$

03 Data & Key Variables. Stage 1

Tax Capacity Estimation: $TAXREV\_GDP_{it} = \alpha + \beta' X_{it} + \lambda_t + \varepsilon_{it}$

Macroeconomic	GDP per capita | GDP growth | Global productivity growth (% of output growth rate) | Interest rate | Inflation (GDP deflator (annual %)
Structural	Unemployment rate | Total investment (% of GDP) | Labor force participation rate (% of population 15–64)
Fiscal	Corporate income tax rate (CIT)
Financial Openness	Portfolio investment (net, USD)
Dependent Variable	TAXREV_GDP - defined as total tax revenues as a share of GDP

Balanced Global Panel | 1990–2024 | 947 Observations | Source: Author's elaboration based on World Bank Data

03 Data & Key Variables. Stage 2

Residual: ResidTaxGap = Observed TAXREV_GDP − Predicted TAXREV_GDP

Residual determinants: $ResidTaxGap_{it} = \alpha_i + \beta_1 Macroeconomic_{it} + \beta_2 Structural_{it} + \beta_3 Fiscal_{it} + \beta_4 Institutional_{it} + \lambda_t + \varepsilon_{it}$

Macroeconomic and Structural	GDP growth | Inflation rate | Interest rate | Global productivity growth rate | Unemployment rate
Investment and Capital Mobility	FDI net outflows (% of GDP) | Portfolio investment, net (BoP, current US$) | Total investment (% of GDP)
Fiscal	Corporate income tax rate (CIT)
Institutional	WGI Control of Corruption | OECD Tax Haven dummy
Dependent Variable	Residual tax gap

Source: Author's elaboration based on World Bank Data

04 Model Validation: Diagnostic Tests & Fixed-Effects Selection

Hausman Specification Test — PASS

Rejects consistency of RE estimator → Fixed-Effects model retained as preferred specification.

Wooldridge Test — ADDRESSED

Serial correlation present in panel residuals → clustered standard errors applied at country level.

Breusch–Pagan Test — ADDRESSED

Non-constant error variance detected → robust clustered + bootstrap correction applied.

Pesaran CD Test — ADDRESSED

Common shocks across countries detected → time fixed effects included to absorb global factors.

Levin–Lin–Chu Unit Root Test — PASS

FE vs. RE — Decision

Fixed Effects

✓ Controls unobserved country heterogeneity
✓ Consistent under Hausman test
✓ Preferred by diagnostics

Random Effects

REJECTED

✗ Inconsistent (Hausman p<0.05)

SE Corrections Applied

Clustered (country) + Bootstrap
1000 replications — Pagan (1984)

Conclusion: Fixed-Effects specification is retained as the preferred model. All diagnostic tests confirm the robustness of the results.

05 Stage 2: Fixed-Effects Regression Results

R^2	Obs.	F-stat	p > F
0.395	947	86.50	< 0.001

Variable	Coef.	p-value	Sig.	Interpretation
Unemployment rate	−0.287	< 0.001	***	More unemployment → smaller tax gap
FDI outflows / GDP	−0.260	0.012	**	Globally integrated economies → better tax performance
Portfolio investment (ln)	+0.320	< 0.001	***	Mobile capital → larger fiscal deviations
Total investment / GDP	+0.074	0.026	**	Economic complexity → more optimization scope
CIT rate	+0.113	0.001	***	Higher rates → revenues exceed structural benchmark
Control of Corruption (WGI)	−0.361	< 0.001	***	Stronger governance → smaller tax gap
OECD Tax Haven (dummy)	+2.746	< 0.001	***	Haven structures → large positive distortions
GDP growth rate	0.040	0.312	n.s.	No significant effect
Inflation rate	−0.030	0.179	n.s.	No significant effect

Source: Authors' own research results based on estimations performed in Stata software

05 Finding 1: Macroeconomic Conditions Play a Secondary Role

Tax gap dynamics are driven less by short-term macroeconomic fluctuations than by structural and institutional factors.

NOT Statistically Significant

GDP Growth Rate

β = +0.040 p = 0.312

Inflation Rate

β = −0.030 p = 0.179

Global Productivity Growth

β = −0.019 p = 0.733

Key Cyclical Channel — Significant

Unemployment Rate

β = −0.287 | p < 0.001 | *

A 1pp rise in unemployment → −0.29 unit reduction in the tax gap (≈ 7% of sample mean).

Compresses the taxable base through lower labor income and consumption.

Enforcement of regulations becomes relatively more effective during recessions, as tax authorities reallocate monitoring resources

Policy implication: Tax administration strategy should not rely primarily on cyclical levers — structural reform is what matters.

05 Finding 2: Different Forms of Capital Mobility Have Distinct Effects

NEGATIVE

FDI Outflows / GDP

β = −0.260 **

A 1 pp rise in FDI Outflows → −0.26 unit reduction in the tax gap (≈ 6% of sample mean).

More globally integrated & institutionally stronger economies → more efficient tax systems.
FDI reduces the domestic tax base by shifting profits abroad, mechanically lowering the estimated fiscal deficit. The negative coefficient reflects a compositional effect rather than improved tax efficiency.

POSITIVE

Portfolio Investment (ln)

β = +0.320 ***

1% increase → +0.32 unit tax gap (≈ 8% of mean).

Highly mobile financial flows increase opportunities for tax planning, income shifting & cross-border base erosion.

POSITIVE

Total Investment / GDP

β = +0.074 **

1% increase → +0.07 unit tax gap (≈ 2% of mean).

Higher investment → increased economic complexity → more scope for optimization strategies
Higher investment expands the tax base via increased profitability, employment, and asset accumulation, generating positive fiscal effects

05 Finding 3: Fiscal Policy — CIT Rate Effect

β = +0.113 | p = 0.001 | *

Higher statutory CIT rates → actual revenues exceed structurally predicted levels

Mechanical Revenue Effect

Higher rates directly raise revenues — the expected statutory channel from the tax competition literature (Devereux & Griffith, 2003).

Unobserved Institutional Capacity

Countries setting higher CIT rates may also have stronger enforcement infrastructure not fully captured by the WGI indicators.

Fiscal Policy Endogeneity

Rate levels are set endogenously by governments responding to fiscal needs.

05 Finding 4: Institutional Quality — The Key Stabilizer

Control of Corruption (WGI)

β = −0.361

p < 0.001 | ***

1-unit improvement in corruption control → −0.36 unit reduction in the tax gap (≈ 9% of sample mean)

- Stronger enforcement capacity
- Higher detection probability
- Reduced opportunities for noncompliance
- Closer alignment of observed vs. predicted revenues

OECD Tax Haven Status

β = +2.746

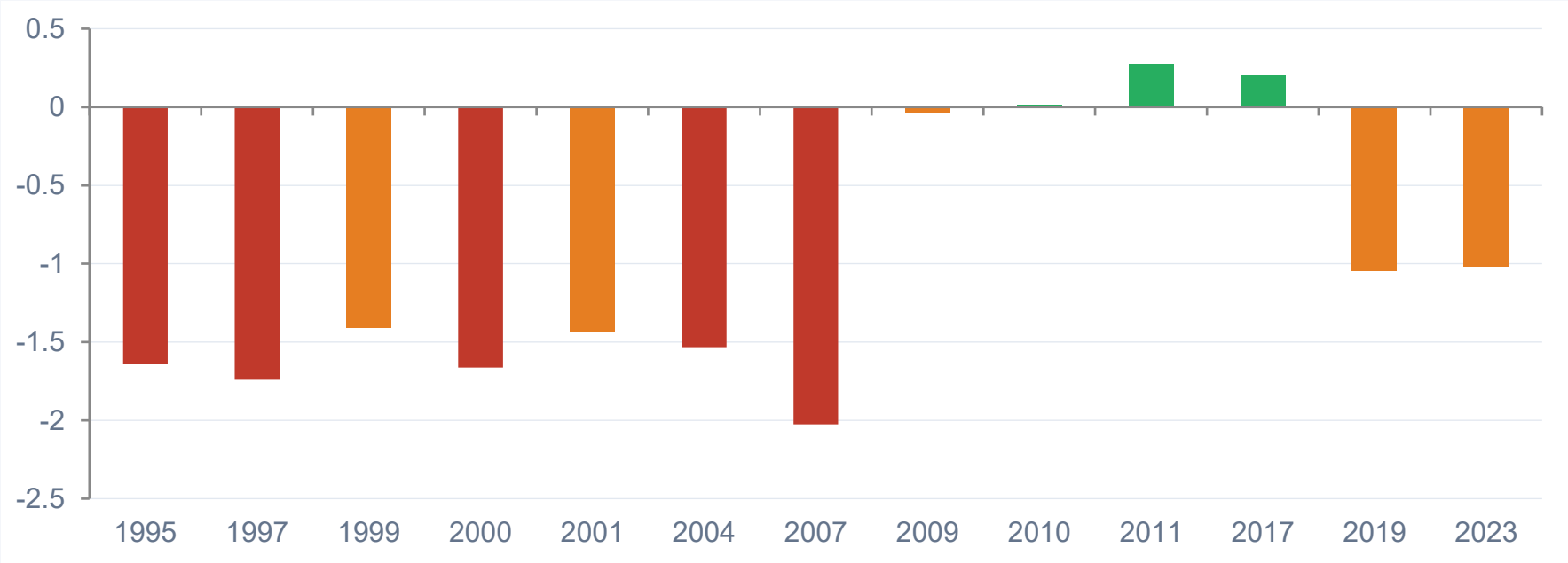
p < 0.001 | ***

Tax haven jurisdictions exhibit tax gaps ~2.75 units higher (≈ 66% of sample mean)

The positive sign may seem counterintuitive, but it reflects a **concentration effect**: these jurisdictions attract highly mobile income (financial services, holding structures, royalties), generating revenues above structural benchmarks (even while eroding bases elsewhere)

The distortion stems from the global tax architecture, not domestic compliance

06 Temporal Dynamics: Year Fixed Effects



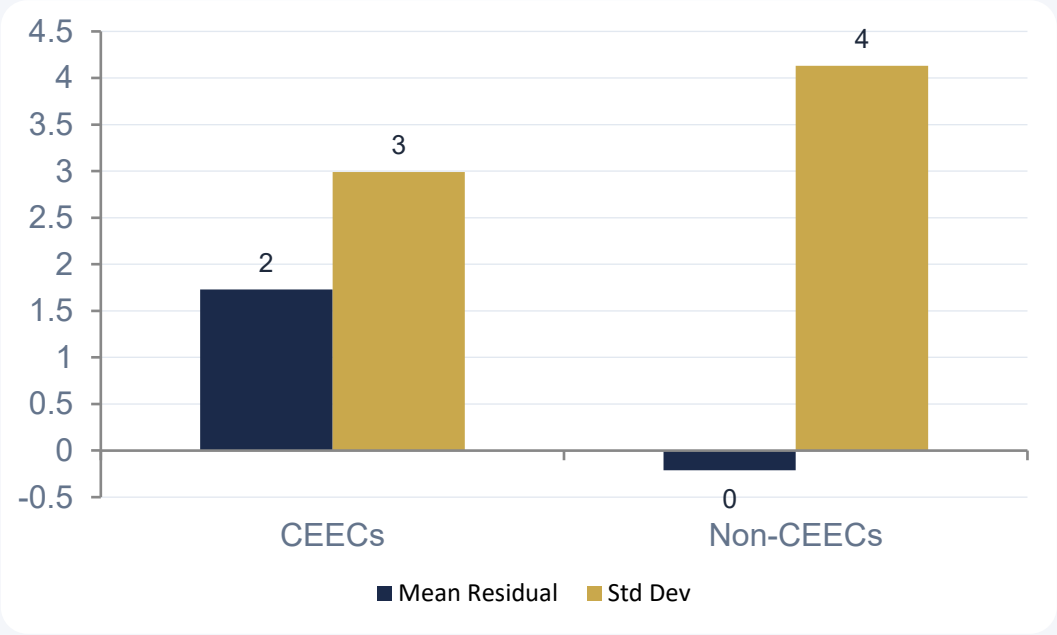
1993–2007: Significant negative coefficients (lowest in 2007), reflecting pressures from the Asian crisis, dot-com recession, and pre-crisis

Post-2009: Effects fade toward zero, consistent with post- Global Financial Crisis fiscal consolidation and early global tax coordination (BEPS)

2019–2024: Moderately negative, reflecting COVID-19 disruptions, partly offset by large-scale fiscal interventions, including stimulus measures, tax deferrals, and increased public spending

Source: Authors' own research results based on estimations performed in Stata software

06 Territorial Analysis: CEECs vs. Non-CEECs



CEECs — Mean: +1.729 | SD: 2.992

Above model-benchmark revenues on average. Reflects transitional catch-up dynamics, recent admin improvements & shared institutional trajectories.

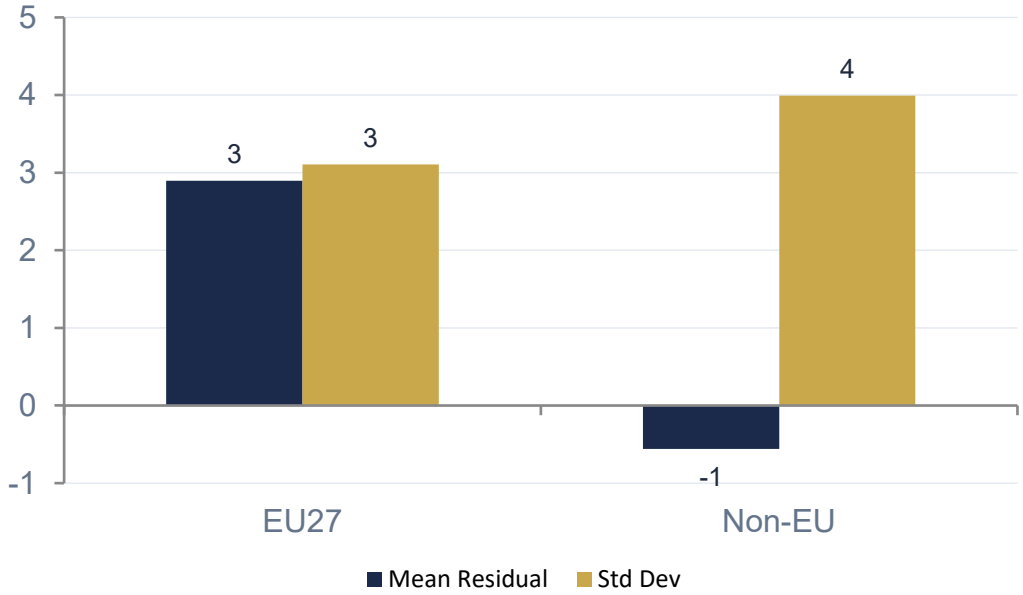
Non-CEECs — Mean: −0.213 | SD: 4.132

Marginally below benchmark. Reflects advanced-economy complexity, cross-border optimization, and higher heterogeneity across diverse fiscal systems.

CEECs show more homogeneous deviations — consistent with shared convergence trajectories.
Non-CEECs exhibit greater dispersion, reflecting multinational complexity.

Source: Authors' own research results based on estimations performed in Stata software

06 Territorial Analysis: EU27 vs. Non-EU Countries



EU27 Mean: +2.895 | SD: 3.108

Systematically exceeds benchmark. Advanced admin, EU fiscal coordination & third-party reporting drive above-predicted revenues.

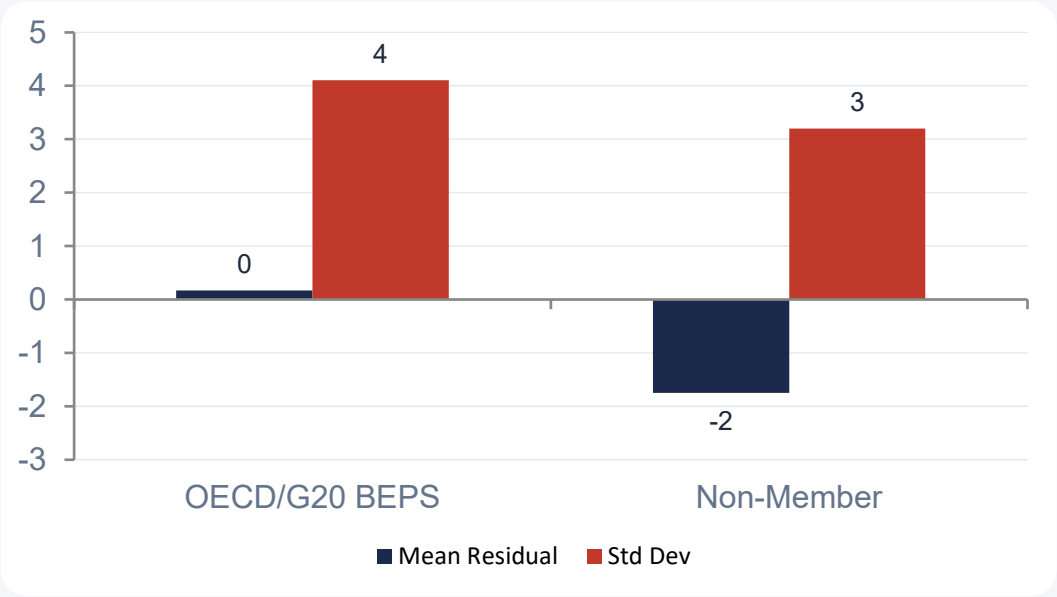
Non-EU Mean: −0.560 | SD: 3.994

Marginally below benchmark. Greater heterogeneity in enforcement, institutional maturity & structural composition across diverse non-EU economies.

EU institutional integration — regulatory harmonization, compliance technology & BEPS reforms — is a key driver of positive residual fiscal performance.

Source: Authors' own research results based on estimations performed in Stata software

06 Territorial Analysis: OECD/G20 BEPS Members vs. Non-Members



OECD/G20 BEPS Mean: +0.168

Tightly aligned with benchmark (mean ≈ 0). High internal dispersion (SD=4.10) reflects heterogeneous BEPS implementation & complexity of multinational taxation.

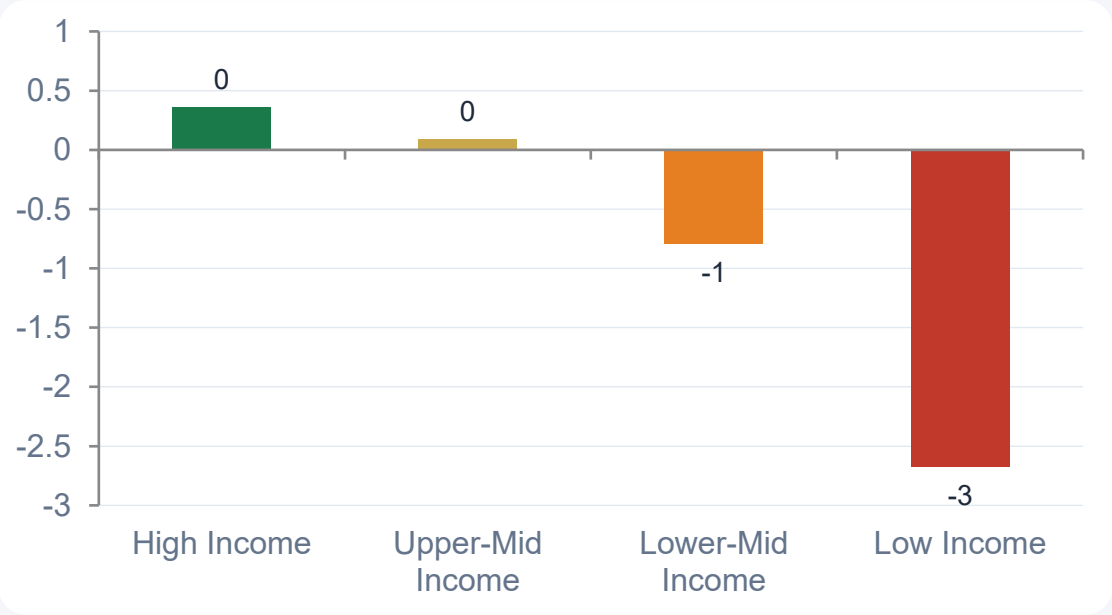
Non-Members Mean: −1.748

Systematic underperformance: lower GDP, administrative constraints, less integration into global tax coordination frameworks.

BEPS membership aligns residuals close to zero on average, but substantial heterogeneity persists — enforcement capacity and regime design vary widely even among members.

Source: Authors' own research results based on estimations performed in Stata software

06 Residual Tax Gap by Country Income Group



High Income (Mean +0.359)

Advanced admin, third-party reporting & formalization → slightly above benchmark.

Upper-Middle (Mean +0.092)

Near-benchmark performance — transitional convergence broadly achieved.

Lower-Middle (Mean –0.791)
Low Income (Mean -2.672)

Administrative constraints & limited base coverage drive modest underperformance.

A clear gradient from positive (high income) to deeply negative (low income) residuals — structural tax capacity is strongly development-dependent.

Source: Authors' own research results based on estimations performed in Stata software

06 Tax Havens & Harmful Regimes: Structural Distortions

Not harmful

Slightly above expected revenues; well-aligned but heterogeneous systems.

Under review Jurisdictions

Below expected revenues with high volatility; transitional and uneven systems

Non-member OECD/G20 BEPS

Systematic underperformance vs. capacity; constrained and less integrated systems

Tax haven classification captures jurisdictional positioning in global tax architecture.
Comparative pattern: “Not harmful” = stable, well-aligned systems; “under review” = transitional and volatile systems; non-member = structurally constrained systems with persistent underperformance.

Note - Countries classified as “actually harmful” are excluded due to incomplete and inconsistent data coverage across countries and years, which may introduce measurement error and bias in the estimation of residuals

06 Temporal Dynamics of the Residual Tax Gap in Europe

$$\Delta ResidTaxGap_{i,t} = ResidTaxGap_{i,t} - ResidTaxGap_{i,t-1}$$ | $\Delta > 0$ = Deterioration $\Delta < 0$ = Improvement $\Delta = 0$ = Stability

1993–1995

$\Delta < 0$ ▼

Post-Communist Transition

Deterioration vs. fiscal benchmark. Institutional fragility, evolving accounting standards, volatile corporate profitability in CEECs.

1997–2000

$\Delta > 0$ ▲

EU Convergence & Expansion

Overall improvement. Macroeconomic expansion, enhanced audit capacity, harmonization of corporate reporting standards.

2001–2006

Δ ↕ Alternating

Dot-com Slowdown & Complexity

Alternating dynamics. Increased multinational tax planning complexity as firms expanded cross-border operations in the EU market.

2008–2009

$\Delta < 0$ ▼▼ Sharp

Global Financial Crisis

Sharp negative adjustment in 2009. Corporate profit contraction, increased loss reporting, greater reliance on tax deferral mechanisms.

2011 - 2013

$\Delta < 0$ ▼

Sovereign Debt Crisis

Negative shift aligned with European debt crisis. Fiscal consolidation, subdued demand, constrained investment in Southern Europe.

2015–2017

$\Delta > 0$ ▲

Recovery & BEPS Reforms

Generally improving dynamics. EU recovery, improved labor markets, early effects of international profit-shifting coordination (BEPS).

2020 onwards — COVID-19: Unprecedented fiscal interventions partially offset deterioration; normalization phase underway.

- (i) Tax gaps are strongly pro-cyclical — worsen in recessions, improve in expansions
- (ii) GFC (2008) & Sovereign Debt Crisis (2011–13): persistent, asymmetric fiscal effects
- (iii) EU integration and BEPS coordination contributed to medium-term tax alignment

06 Synthesis: Three Explanatory Dimensions

1

Structural Tax Capacity

- High-income & EU27 → positive residuals (advanced administration and formalization)
- Low-income → negative residuals (enforcement constraints and narrow base)
- CEECs → intermediate position, catch-up dynamics in progress

2

Institutional Capacity & Governance

- Corruption control: strongest & most robust determinant
- Enforcement credibility and detection probability shape compliance
- Temporal attenuation post-2008 reflects BEPS & EU fiscal coordination

3

Global Fiscal Environment

- Portfolio investment (+) vs FDI outflows (−): opposing capital mobility effects
- Tax haven dummy (β=+2.746***) → profit concentration distortions
- EU non-cooperative jurisdictions → systematic below-benchmark revenues

07 Key Conclusions

01 ~40% of within-countr y variation in the residual tax gap is systematically explained by structural and policy-related determinants, not by macroeconomic fluctuations.
Deviations are systematic, not random.

02 Institutional quality — especially corruption control — is a more powerful predictor of fiscal performance than tax rates (β=−0.361***). A one-unit improvement in governance reduces the fiscal gap by 0.36 points — three times more than any rate change could achieve.

03 Tax system composition outperforms statutory CIT rates: income tax reliance better captures administrative capacity and base breadth.

04 Macroeconomic conditions are secondary; unemployment is the main cyclical transmission channel (β=−0.287***).

05 Tax haven structures introduce large positive distortions (β=+2.746***): profit concentration > structural benchmark predictions.

06 Financial integration matters asymmetrically: FDI outflows (−) vs. portfolio investment (+) carry opposite fiscal implications.

07 Persistent cross-country heterogeneity: advanced/EU/OECD economies → positive residuals; lower-income/non-member → negative gaps.

07 Policy Implications by Country Group

Low-Income Economies

- ✓ Expand tax base coverage & taxpayer registration
- ✓ Strengthen basic audit & enforcement infrastructure
- ✓ Increase economic formalization of labor market
- ✓ Improve third-party reporting mechanisms

Advanced Economies

- ✓ Contain profit shifting & base erosion (BEPS implementation)
- ✓ Align effective tax rates with statutory levels
- ✓ Improve coordination of anti-avoidance frameworks
- ✓ Address complexity in multinational taxation

Transitional / Middle-Income

- ✓ Sustain institutional convergence & regulatory harmonization
- ✓ Capacity building in tax administration
- ✓ Leverage EU / OECD accession for governance improvement
- ✓ Reform tax system composition (reduce informality)

07 Limitations & Future Research Agenda

Current Limitations

Macro-Level Analysis

Abstracts from firm-level behavior and granular compliance data — micro evidence needed.

Institutional Indicators

WGI proxies are broad; richer, granular governance datasets would refine results.

Future Research Agenda

Micro-Firm Level Integration

Link macro residuals to corporate panel data on tax planning, transfer pricing & profit shifting.

Richer Institutional Data

Exploit tax authority capacity indices, e-filing penetration rates & audit intensity metrics.

Causal Effect

Causal relationships between international tax policies and macroeconomic variables in the context of implementing the OECD/G20 Inclusive Framework consensus.

Note: The estimated residual tax gap further serves as a proxy variable in a companion study examining the dynamic causal effect between international tax policy and key macroeconomic aggregates through a VAR-based model, situating this broader research agenda within the OECD/G20 approach to multinational companies taxation and its implications for EU member states.

Thank You

Key takeaway:

- Institutional strength and financial integration jointly govern residual tax gap dynamics.
- Rate-based tax policy has limited explanatory power once broader structural mechanisms are accounted for.
- A one-unit improvement in governance reduces the fiscal gap three times more than any rate adjustment could achieve.

Questions & Discussion Welcome