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Competitiveness of the tax system and economic growth

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Abstract

This paper examines whether the design of a country's tax system matters for economic growth using the Tax Foundation's International Tax Competitiveness Index (ITCI), a composite of more than 40 legislated tax-policy variables spanning corporate, individual income, consumption, property, and cross-border tax rules. Exploiting within-country variation across 23 European economies over 2014–2024, we estimate two-way fixed-effects panel regressions and dynamic distributed-lag specifications. Three findings emerge. First, improvements in aggregate tax competitiveness are positively and significantly associated with real GDP per capita growth, robust to a wide range of controls. Second, this aggregate effect is driven entirely by the corporate tax pillar; no other component displays a significant growth effect. Third, the corporate tax effect materializes contemporaneously and accumulates over time, with a statistically significant three-year cumulative effect of approximately 0.16 percentage points per one-point improvement in the corporate tax score. These results suggest that the full architecture of the corporate tax system—not merely the headline statutory rate—is what matters for growth.

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1. Introduction

Does the design of a country's tax system matter for economic growth? This question sits at the heart of public finance, yet several decades of empirical research have produced strikingly inconclusive answers. While few economists doubt that distortionary taxation can impede investment, labor supply, and innovation in theory, credible identification of growth effects in the cross-country data remains challenging. The difficulty is threefold: the standard measures of tax policy are endogenous to the business cycle; the causal channel runs in both directions; and the growth effects of taxes may materialize only slowly.

The most direct recent challenge to the received wisdom comes from Kawano et al. (2025), who assemble a new cross-country dataset of statutory top rates for corporate income tax (CIT), personal income tax (PIT), and value-added tax (VAT), supplemented by base information. They find no statistically robust medium-term effect of top rate changes on GDP at a five-year horizon for any of the three tax types. Their null result constitutes an important benchmark: even the most policy-salient components of the tax system—headline statutory rates—do not appear to reliably drive growth.

Our paper takes the logic of Kawano et al. (2025) one step further. If top-rate changes lack robust growth effects, it may be because *rates* are only one dimension of a tax system's economic character. Two countries can share the same statutory corporate rate yet differ substantially in the treatment of losses, the generosity of capital cost recovery, the breadth of the VAT base, or the complexity of cross-border rules—all of which affect investment incentives and factor allocation. To capture these broader structural features, we replace headline rates with the Tax Foundation's International Tax Competitiveness Index, a composite of more than 40 tax-policy variables spanning five pillars: corporate taxes, individual income taxes, consumption taxes, property taxes, and cross-border tax rules. Crucially, the ITCI scores statutory rates *alongside* qualitative features of the tax base and tax administration. Because the index is constructed from legislated design features rather than realized revenues, it avoids the simultaneity bias that afflicts revenue-based measures and offers a more exogenous characterization of how countries structure their tax systems.

Three findings emerge consistently across all specifications. First, improvements in overall tax competitiveness are positively and significantly associated with growth. Second, decomposing the index into its five components reveals that this aggregate effect is driven entirely by *corporate tax competitiveness*; no other pillar displays a significant growth effect at conventional levels. Third, the dynamic analysis shows that the growth effect of corporate tax competitiveness materializes contemporaneously and accumulates over the medium run, with a statistically significant three-year cumulative effect.

This paper makes three contributions to the literature. First, it introduces the ITCI as a novel, multidimensional measure of tax system design for cross-country growth regressions, going beyond both the single-rate approach of Kawano et al. (2025) and the revenue-share approach of Arnold et al. (2011). Second, the paper provides new evidence on the *heterogeneity* of tax effects across pillars: the growth relevance of tax system quality is concentrated in the corporate dimension, consistent with theoretical channels emphasizing investment and capital allocation, but inconsistent with the broad "tax and growth ranking" of Arnold et al. (2011). Third, within a dynamic framework the paper documents that the corporate competitiveness effect builds over time, a finding consistent with models in which investment responds to forward-looking changes in the tax environment but adjustment takes several years to fully materialize.

The remainder of the paper is organized as follows. Section 2 situates our contribution within the existing literature on taxes and growth. Section 3 describes the ITCI and its sub-components, the additional data sources used, and our empirical strategy. Section 4 presents and discusses the results. Section refsec:conc concludes with a discussion of policy implications and avenues for future research.

2. Literature Overview

Modern empirical work on taxes and growth descends from Barro (1991), which—like follow-ons such as Lee and Gordon (2005)—uses long differences or long-period averages in cross-country panels to mute short-run endogeneity. Identification hinges on conditioning out all confounders that co-move with both taxes and growth, an assumption that proves fragile: estimated effects swing with the control set (Easterly and Rebelo, 1993).

SVARs (Blanchard and Perotti, 2002) try to sidestep this by timing restrictions—output may react on impact to tax changes, whereas tax policy responds only with a lag. But these designs break if tax changes are anticipated, forward-looking, or implemented quickly, and the curse of dimensionality often confines them to single-country settings.

The pooled mean group (PMG) approach (Arnold et al., 2011; Pesaran et al., 1999) imposes a common long-run tax–growth link across countries, yielding the influential ranking that indirect taxes are more growth-friendly than direct taxes. Subsequent work shows, however, this ranking is fragile to alternative assumptions (Xing, 2012), proper clustering (Baiardi et al., 2019), and sample expansions (Widmalm, 2001; Angelopoulos et al., 2007; Xing, 2012; Baiardi et al., 2019).

A similar strand of the literature ranks tax instruments by their growth costs. Johansson et al. (2008), Arnold et al. (2011), and Şen and Kaya (2023) consistently identify corporate income taxes as the most harmful to growth, followed by personal income taxes and consumption taxes, with property taxes ranked least damaging. Acosta-Ormaechea et al. (2019), by contrast, places personal income taxes at the top of the ranking and corporate taxes second. Despite disagreement on the precise ordering, these studies share a common finding: not all taxes are equally distortionary, and the composition of the tax mix matters for long-run growth. Our results are broadly consistent with the prominence of corporate taxation in this literature, though we go further by showing that it is not the corporate tax rate per se but the broader design of the corporate tax system, as captured by the ITCI's corporate pillar, that drives the estimated growth effect.

Recently, narrative methods (Romer and Romer, 2010) have become the preferred strategy: researchers classify exogenous tax changes from official documents, then estimate dynamic effects via SVARs or local projections (see e.g., Barro and Redlick, 2011; Mertens and Ravn, 2014). Applications to the U.S. find large short-run multipliers for tax increases, and cross-country narrative work (Alesina et al., 2015, 2019; Dabla-Norris and Lima, 2023) similarly links tax-based consolidations to deep, persistent downturns—suggesting that non-narrative designs are biased toward smaller effects.

Across these strands, however, nearly all papers share the same core measurement problem: tax "shocks" are proxied by changes in realized or projected revenues (often average tax rates defined as revenue changes over baseline GDP).

Because official revenue scoring—even when labeled "static"—builds in expected behavioral responses and growth forecasts, these constructed tax-rate measures are endogenous by construction to the very outcomes being studied. Using narratively classified revenue changes as instruments for total tax changes does not purge this simultaneity: the instrument inherits the revenue-based endogeneity embedded in forecast methods.

One notable exception is Mertens and Olea (2018). They instrument observed changes in average marginal tax rates with predicted AMTR changes computed from a fixed base-year income distribution (a Bartik-style shift–share). This design severs the mechanical link between the tax-rate measure and contemporaneous (or forecasted) growth and behavior, directly targeting the endogeneity that plagues revenue-based rate construction in the rest of the literature.

Most recently an alternative approach has been proposed by Kawano et al. (2025), who rely on qualitative data about the tax systems, primarily statutory tax rates. build a new cross-country dataset of statutory top rates for corporate income tax (CIT), personal income tax (PIT), and value-added tax (VAT), supplemented by base information. Unlike much of the prior literature, they avoid revenue-based measures (which are endogenous to output) and focus on statutory rates. Across all methods and tax types, they find no statistically robust medium-term effect (five years out) of top PIT, CIT, or VAT rate changes on GDP. A comprehensive meta-regression of 441 estimates from 42 primary studies by Gechert and Heimberger (2022) similarly finds that, after correcting for publication bias, the average growth effect of corporate tax cuts cannot be distinguished from zero, reinforcing the view that headline statutory rates are an imprecise proxy for the investment incentives embedded in the full tax code.

3. Data & Methods

3.1. Tax competitiveness

In light of the above observations, this paper proposes using qualitative data on the components of the tax system. Compared to Kawano et al. (2025), however, we go into much more detail on tax systems and include more components and further tax variables.

We use the Tax Foundation International Tax Competitiveness Index (ITCI), which combines statutory tax rates with qualitative and quantitative data on the base and the complexity of taxes. That countries actively compete over corporate taxes is well-documented: Heimberger (2021) synthesises 604 estimates from 33 primary studies and finds small-to-moderate but robust evidence of strategic interdependence in corporate tax-setting, with results sensitive to the weighting scheme and the measure of corporate taxation used.

The logic of the index is the hypothesis that two elements of the tax system are important for its competitiveness: low marginal tax rates and tax system neutrality. High marginal tax rates could deter growth by negatively affecting investment decisions and inducing tax avoidance. On the other hand, a neutral tax code is one that seeks to raise the most revenue with the fewest economic distortions. It also means few or no targeted tax breaks for specific activities carried out by businesses or individuals. As tax laws become more complex, they also become less neutral. If, in theory, the same taxes apply to all businesses and individuals, but the rules are such that large businesses or wealthy individuals can change their behavior to gain a tax advantage, this undermines the neutrality of a tax system (Tax Foundation, 2025). To measure whether a country's tax system is neutral and competitive, the ITCI looks at more than 40 tax policy variables. These variables measure not only the level of tax rates, but also how taxes are structured. The components included are listed in Table 1. Data is available for the years 2014 to 2024 and includes OECD countries.

Compared to the previous literature, the ITCI and its subcomponents offer a broader perspective. Although Kawano et al. (2025) improve earlier revenue-based measures by focusing on statutory rates, their findings highlight the difficulty of isolating robust causal effects. In contrast, the ITCI evaluates the overall structure of national tax systems across five dimensions: corporate, income, consumption, property, and cross-border rules, incorporating important tax-base components such as loss carryforwards, cost recovery rules, VAT base breadth, and cross-border withholding taxes. This breadth allows the ITCI to capture the design features and interactions among different taxes that shape long-term competitiveness, rather than focusing primarily on headline rates.

3.2. Empirical strategy

Our empirical approach follows the recent cross-country tax and growth literature that emphasizes medium-run dynamics in panel settings while controlling for unobserved heterogeneity and global shocks (e.g., Barro, 1991; Arnold et al., 2011; Kawano et al., 2025). We estimate fixed-effects panel regressions relating real GDP per capita growth to changes in tax competitiveness, exploiting within-country variation over time.

Table 1: Components of the tax competitiveness index

Tax Category	Ranking Components Included
Corporate Taxes	- Top marginal corporate tax rate
	- Loss carryback and carryforward rules
	- Cost recovery for machinery, buildings, intangibles
	- Inventory treatment
	- Allowance for corporate equity
	- Patent box regimes
	- R&D tax subsidies
	- Digital services taxes
	- Complexity (number of rates, alternative minimum taxes, surtaxes)
	- Share of revenue from non-standard income taxes
Income Taxes	- Top marginal income tax rate
	- Threshold at which top rate applies (as multiple of average income)
	- Ratio of marginal to average tax wedge
	- Existence of surtaxes on income
	- Revenue share from non-standard payroll and social security contributions
	- Top marginal capital gains tax rate
	- Top marginal dividend tax rate
Consumption Taxes	- Standard VAT/sales tax rate
	- VAT/sales tax registration threshold
	- VAT base as % of total consumption (broadness of base)
	- Treatment of intermediate goods (exemptions/credits)
	- Reduced rates and exemptions that narrow the base
Property Taxes	- Real property/land tax existence and design
	- Deductibility of property taxes
	- Real property taxes as % of capital stock
	- Existence of net wealth tax
	- Existence of inheritance/estate/gift taxes
	- Transfer taxes (e.g., stamp duty, real estate transfer tax)
	- Asset-based taxes (bank taxes, equity/net asset taxes)
	- Financial transaction taxes
Cross-Border Tax Rules	- Dividend exemption for foreign-sourced income
	- Capital gains exemption for foreign-sourced income
	- Withholding tax rates on dividends, interest, royalties
	- Number of tax treaties
	- Controlled foreign corporation (CFC) rules
	- Interest deduction limitations
	- Existence of minimum taxes
	- Income inclusion rules (e.g., GILTI-type)

Baseline specification.. Let $Y_{c,t}$ denote real GDP per capita in country c and year t. The dependent variable is the annual growth rate,

$$g_{c,t} = \frac{Y_{c,t} - Y_{c,t-1}}{Y_{c,t-1}}.$$

Our main explanatory variables are year-to-year changes in the Tax Foundation's International Tax Competitiveness Index (ITCI) and its subcomponents. We work with first differences of index scores, denoted $\Delta\tau_{c,t}$, to capture discrete policy and institutional changes rather than levels.

The baseline model is

$$g_{c,t} = \alpha + \beta\,\Delta\tau_{c,t} + \delta_t + \mu_c + \varepsilon_{c,t}, \tag{1}$$

where μ_c are country fixed effects and δ_t are year fixed effects absorbing global shocks such as business cycles or common policy trends. Standard errors are clustered at the country level.

Controls and conditioning variables.. We progressively enrich equation (1) by adding a standard set of controls motivated by the growth and public finance literature. First, we condition on the lagged level of income,

$$\ln Y_{c,t-1},$$

to account for convergence dynamics (Barro, 1991). Second, we include changes in the share of the highly educated population ($\Delta\text{Edu}_{c,t}$) as a proxy for human capital accumulation.

To account for distributional conditions, we include the Gini coefficient of equivalised disposable household income before taxes and social contributions, denoted $G^{\text{pre}}_{c,t}$ (Berg et al., 2018). In addition, we control for the redistributive effect of the tax-benefit system,

$$RE_{c,t} = G^{\text{pre}}_{c,t} - G^{\text{post}}_{c,t},$$

where $G^{\text{post}}_{c,t}$ is income inequality after taxes and transfers.[1] This distinction allows us to separate pre-tax income dispersion from redistribution through fiscal policy (Alesina et al., 2015; Dabla-Norris and Lima, 2023).

Dynamic specification.. To capture short- and medium-run dynamics, we estimate distributed-lag specifications with a limited lag length $T = 1$:

$$\begin{aligned} g_{c,t} = \alpha + \rho\, g_{c,t-1} + \sum_{h=0}^{T} \beta_h\, \Delta\tau_{c,t-h} + \theta \ln Y_{c,t-1} \\ + \sum_{h=0}^{T} \lambda_h\, RE_{c,t-h} + \sum_{h=0}^{T} \kappa_h\, \Delta \text{Edu}_{c,t-h} + \delta_t + \mu_c + \varepsilon_{c,t}. \end{aligned} \tag{2}$$

Including lagged growth absorbs short-run persistence and mitigates serial correlation concerns, while keeping the model parsimonious given the limited time dimension of the panel.

The cumulative effect of a tax competitiveness change over the $T + 1$-year horizon is computed as

$$\sum_{h=0}^{T} \beta_h,$$

which we estimate using linear combinations of coefficients.

Aggregate versus component-level effects.. We estimate equation (2) using two alternative definitions of $\Delta\tau_{c,t}$:

- changes in the overall ITCI score ($\Delta\text{ITCI}_{c,t}$), capturing broad reforms of the tax system;
- simultaneous changes in its main components—corporate, consumption, in-

[1] Data used from EU-SILC (Eurostat variable `ilc_di12b` and `ilc_di12c`)

come, and property tax competitiveness—allowing us to assess heterogeneous growth effects across tax instruments.

This mirrors the distinction in the literature between overall tax structure reforms and shifts in the tax mix (Arnold et al., 2011; Xing, 2012).

Coefficients on $\Delta\tau_{c,t}$ measure the change in annual GDP per capita growth associated with a one-point improvement in tax competitiveness. Since ITCI scores are cardinal but bounded, estimates should be interpreted as semi-elasticities rather than structural tax multipliers. The focus is therefore on relative magnitudes and persistence rather than precise welfare effects.

Overall, this framework allows us to trace the short- to medium-run growth implications of discrete changes in tax system design while accounting for income levels, redistribution, human capital, and unobserved heterogeneity.

4. Results

4.1. Static fixed-effects estimates

Table 2 reports baseline two-way fixed-effects regressions using annual changes in the aggregate Tax Competitiveness Index (ITCI). The estimated coefficient on ΔTC^{tot} is not statistically significant in the most parsimonious specification (column 1, $N = 243$), but turns positive and marginally significant at the 10% level once lagged income, educational attainment, and FDI are added (column 2), and remains significant at the 5% level once distributional controls—pre-tax inequality and the redistribution level—are included (column 3). Adding quality of government, investment share, and FDI as further controls in column 4 leaves the coefficient essentially unchanged ($\hat{\beta} = 0.00149$, $p < 0.05$). Across all four specifications the coefficient is stable, ranging from 0.00051 to 0.00149. Lagged log

GDP per capita enters negatively and significantly throughout, consistent with conditional convergence. Changes in educational attainment, pre-tax inequality, and the level of redistribution are not statistically distinguishable from zero in any specification once country and year fixed effects are controlled for.

Table 2: Static fixed-effects regressions: Aggregate tax competitiveness

	(1)	(2)	(3)	(4)
ΔTC^{tot}	0.00051	0.00101*	0.00117**	0.00149**
	(0.00051)	(0.00053)	(0.00057)	(0.00066)
$L.\ln GDP$		-0.158***	-0.154***	-0.195***
		(0.031)	(0.036)	(0.034)
High education		0.00040	0.00006	0.00005
		(0.00107)	(0.00102)	(0.00094)
FDI inflows		0.000067***		0.000078***
		(0.000014)		(0.000017)
Inequality (pre-tax)			-0.00038	-0.00156
			(0.00189)	(0.00160)
Redistribution (level)			-0.00028	0.00093
			(0.00226)	(0.00220)
Quality of government				n.s.
Investment share				n.s.
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	243	230	226	204

Notes: Dependent variable is real GDP per capita growth. Redistribution enters as the level of $RE_{c,t} = G^{\text{pre}}_{c,t} - G^{\text{post}}_{c,t}$ in columns (3) and (4). Robust standard errors clustered at the country level in parentheses. *, **, *** denote significance at the 10%, 5%, and 1% levels. "n.s." indicates the coefficient is not statistically significant.

Table 3 decomposes the aggregate index into its five components. Across all four specifications, corporate tax competitiveness is the only component that displays a robust and statistically significant positive association with growth. It is significant at the 10% level in the most parsimonious specification (column 1, $p = 0.059$), and reaches the 5% threshold in columns 2–4 once controls are progressively added. Property tax competitiveness enters positively and approaches the 10% significance threshold in columns 3 and 4. Consumption, individual income, and cross-border tax components are not statistically different from zero in any specification. A one-point improvement in corporate tax competitiveness is associated with approximately 0.067–0.074 percentage points of additional annual growth across the four specifications.

Table 3: Static fixed-effects regressions: Tax components

	(1)	(2)	(3)	(4)
ΔTC^{corp}	0.00062*	0.00072**	0.00067**	0.00074**
	(0.00031)	(0.00035)	(0.00032)	(0.00034)
ΔTC^{cons}	0.00040	0.00038	0.00042	0.00039
	(0.00038)	(0.00029)	(0.00029)	(0.00030)
ΔTC^{inc}	-0.00001	-0.00005	-0.00015	-0.00025
	(0.00036)	(0.00040)	(0.00039)	(0.00039)
ΔTC^{prop}	0.00005	0.00041	0.00073*	0.00066*
	(0.00036)	(0.00039)	(0.00037)	(0.00035)
ΔTC^{xb}	-0.00051	-0.00035	-0.00020	-0.00006
	(0.00047)	(0.00049)	(0.00049)	(0.00059)
Controls	No	Yes	Yes	Yes
Inequality & redistribution	No	No	Yes	Yes
Extended controls	No	No	No	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	243	230	226	204

Notes: Column (2) adds lagged log GDP, high education, and FDI inflows. Column (3) additionally adds pre-tax inequality and redistribution (level). Column (4) further adds quality of government and investment share. Robust standard errors clustered at the country level in parentheses. *, **, *** denote significance at the 10%, 5%, and 1% levels.

4.2. Dynamic fixed-effects estimates

We next allow for persistence in growth and delayed policy effects by estimating dynamic fixed-effects models with one lag of GDP growth and contemporaneous and one-year lagged tax changes. The sample covers 23 countries.

Table 4 reports results for the aggregate ITCI ($N = 181$). GDP growth is persistent, with a positive and statistically significant coefficient on the lagged dependent variable ($\hat{\rho} = 0.163$, $p < 0.05$). Neither the contemporaneous nor the one-year lagged change in aggregate tax competitiveness is individually significant; the cumulative two-year effect is positive (0.00231) but not statistically significant ($p = 0.198$).

Table 4: Dynamic fixed-effects regressions: Aggregate tax competitiveness

	(1)
$L.g_{t-1}$	0.163**
	(0.072)
ΔTC_t^{tot}	0.00144
	(0.00093)
ΔTC_{t-1}^{tot}	0.00088
	(0.00113)
$L.\ln GDP$	-0.238***
	(0.043)
Quality of government	n.s.
Investment share	n.s.
Redistribution (level)	n.s.
High education	n.s.
Year FE	Yes
Country FE	Yes
Observations	181

Notes: Dependent variable is real GDP per capita growth. Redistribution enters as the level $RE_{c,t}$. Controls include contemporaneous and lagged redistribution, high education, quality of government, and investment share. Robust standard errors clustered at the country level in parentheses. *, **, *** denote significance at the 10%, 5%, and 1% levels. "n.s." indicates not statistically significant.

Table 5 presents the dynamic specification for all tax components ($N = 203$), including contemporaneous and one-year lagged values of each component along with FDI inflows and redistribution in levels. Corporate tax competitiveness exhibits a positive and statistically significant contemporaneous effect on growth

($\hat{\beta}_0 = 0.00076$, $p < 0.05$), while its one-year lagged effect is smaller and statistically insignificant. None of the remaining components display individually significant short-run effects at conventional levels.

Table 5: Dynamic fixed-effects regressions: Tax components

	Coef.	Std. err.
$L.g_{t-1}$	0.152**	(0.074)
ΔTC_t^{corp}	0.00076**	(0.00031)
ΔTC_{t-1}^{corp}	0.00034	(0.00057)
ΔTC_t^{cons}	0.00051	(0.00035)
ΔTC_{t-1}^{cons}	0.00028	(0.00038)
ΔTC_t^{inc}	-0.00027	(0.00047)
ΔTC_{t-1}^{inc}	-0.00000	(0.00041)
ΔTC_t^{prop}	0.00081	(0.00055)
ΔTC_{t-1}^{prop}	0.00086	(0.00078)
ΔTC_t^{xb}	-0.00016	(0.00059)
ΔTC_{t-1}^{xb}	0.00030	(0.00046)
$L.\ln GDP$	-0.191***	(0.039)
Controls	Yes	
Year FE	Yes	
Country FE	Yes	
Observations	203	

Notes: Controls include lagged log GDP, FDI inflows (contemporaneous and one-year lag), redistribution in levels ($RE_{c,t}$ and $RE_{c,t-1}$), and high education. Robust standard errors clustered at the country level in parentheses. *, **, *** denote significance at the 10%, 5%, and 1% levels.

4.3. Cumulative effects

To summarize short-run policy impacts, we report cumulative effects obtained from post-estimation linear combinations of contemporaneous and lagged coefficients. Table 6 presents two-year (0–1 year) cumulative effects from the full component specification, and Table 7 extends the horizon to three years (0–2 years) for corporate tax competitiveness using an additional specification with two lags

($T = 2$, $N = 158$).

Table 6: Cumulative 0–1 year effects (lincom estimates, $N = 203$)

	Cumulative effect	Std. err.
Aggregate tax competitiveness	0.00231	(0.00174)
Corporate tax competitiveness	0.00110*	(0.00056)
Consumption tax competitiveness	0.00079	(0.00049)
Individual income tax competitiveness	-0.00027	(0.00078)
Property tax competitiveness	0.00167	(0.00113)
Cross-border tax competitiveness	0.00015	(0.00087)
Redistribution (level)	-0.00081	(0.00079)
High education	-0.00023	(0.00204)

Notes: Cumulative effects correspond to $\sum_{h=0}^{1} \beta_h$ from the dynamic component specification. Aggregate effect from the separate aggregate dynamic specification ($N = 181$). * denotes significance at the 10% level ($p = 0.063$).

Table 7: Cumulative 0–2 year effects: Corporate tax competitiveness

	Cumulative effect	Std. err.
Corporate tax competitiveness ($T = 2$)	0.00158**	(0.00064)

Notes: Cumulative effect corresponds to $\sum_{h=0}^{2} \beta_h$ from the dynamic specification with $T = 2$ lags ($N = 158$). Controls as in Table 5 with an additional second lag of each control. **, *** denote significance at the 5% and 1% levels.

The two-year cumulative effect of corporate tax competitiveness is marginally significant ($p = 0.063$), and extends to a precisely estimated and statistically significant three-year cumulative effect of 0.00158 ($p = 0.022$) when the lag structure is extended to $T = 2$. This pattern suggests that the growth impact of improvements in corporate tax competitiveness builds over time, with the contemporaneous effect ($\hat{\beta}_0 = 0.00076$–0.00082) representing only part of the total medium-run response.

Overall, the results consistently identify corporate tax competitiveness as the primary tax-related driver of short-run and medium-run growth. Its contemporaneous effect is statistically significant across static and dynamic specifications alike, and the cumulative effect grows in magnitude and statistical precision as the horizon extends to three years. Improvements in other dimensions of tax competitiveness—consumption, individual income, property, and cross-border rules—as well as changes in inequality, redistribution, and educational attainment, appear largely orthogonal to growth at the horizons considered. These findings hold across 23 European and comparable OECD economies and are robust to the progressive inclusion of FDI inflows, institutional quality, and investment shares as controls.

5. Elements of the corporate tax regime and growth

The finding that corporate tax competitiveness is the sole statistically robust driver of growth among the five ITCI pillars invites a closer reading of the individual design features that constitute this pillar. The ITCI corporate sub-index aggregates ten legislated dimensions (see Table 1): the statutory corporate tax rate, loss carryback and carryforward provisions, cost-recovery rules for machinery, buildings, and intangibles, inventory-valuation treatment, the allowance for corporate equity (ACE), patent box regimes, R&D tax subsidies, digital services taxes, and a composite complexity measure. The literature provides direct evidence that each of these elements shapes firm-level investment and innovation incentives, thereby offering structural channels through which improvements in the aggregate corporate score translate into higher GDP per capita growth.

Statutory rate and effective tax burden. The statutory corporate income tax rate is the most visible element of the corporate tax regime, but it captures only part of the effective burden that firms face when making investment and location decisions.

Devereux and Griffith (2003) show that discrete location choices by multinational firms respond to the *effective average tax rate* (EATR)—a forward-looking measure that combines the statutory rate with the present value of depreciation allowances and other base provisions—rather than to the statutory rate alone. The sustained cross-country trend of declining statutory rates alongside base broadening since the early 1980s—documented by Devereux et al. (2002) for OECD countries—reflects precisely this shift in policy emphasis from the headline rate toward the effective burden. The OECD's forward-looking ETR model, covering ten distinct asset categories across 36 countries, confirms that effective average and marginal tax rates vary substantially across assets, financing sources, and jurisdictions even when statutory rates are held constant (Hanappi, 2018). Accounting for depreciation schedules, inventory-valuation conventions, and interest deductibility limitations can shift a country's EATR by several percentage points relative to its statutory rate, implying that cross-country growth regressions based solely on the statutory rate will systematically mismeasure the true variation in investment incentives. A synthesis of 25 empirical studies by de Mooij and Ederveen (2003) estimates a median semi-elasticity of foreign direct investment of approximately -3.3 with respect to the effective corporate tax rate, so that a one-percentage-point reduction in the host-country rate is associated with a 3.3 % increase in inward FDI. The concentration of the growth effect in the ITCI's corporate pillar—which scores the statutory rate *alongside* base and structural features—is consistent with the view that the full effective tax burden, rather than the headline rate in isolation, governs investment incentives (Kawano et al., 2025). The growth response may, moreover, vary with a country's distance from the technological frontier: Ten Kate and Milionis (2019) find in a cross-country panel that capital tax cuts generate larger growth gains for technology followers than for frontier economies, a heterogeneity that is relevant given the mixed development levels of the EU sample.

Cost recovery and depreciation allowances. Accelerated cost recovery reduces the user cost of capital by bringing forward the present value of deductions for capital expenditure. Exploiting an exogenous 2004 change in the qualifying thresholds for first-year depreciation allowances available to UK small and medium-sized enterprises, Maffini et al. (2019) find that enhanced allowances raised investment rates by between 2.1 and 2.6 percentage points—a pure cost-of-capital effect with no cash-flow component. Zwick and Mahon (2017), analysing over 120,000 US firms using two episodes of bonus depreciation, document that the policy raised eligible investment by 10.4 % (2001–2004) and 16.9 % (2008–2010), with smaller and financially constrained firms responding substantially more than large ones. Complementing this investment channel, Ohrn (2018) uses the US Domestic Production Activities Deduction as a quasi-experiment and finds that each additional dollar of after-tax income generated by the deduction raised investment by approximately $0.37 while simultaneously reducing corporate debt reliance by $0.12—indicating that cost-recovery generosity improves firms' capital structure alongside their capital formation. These estimates together suggest that improving cost-recovery rules—one of the highest-weighted components of the ITCI corporate pillar—can have quantitatively important effects on both aggregate investment and financing distortions.

R&D tax subsidies and patent box regimes. A competitive corporate tax system also encompasses preferential treatment of innovation-related activity. Tax subsidies that lower the cost of R&D investment have been shown to raise both R&D

intensity and innovative output. A comprehensive survey by Hall and Van Reenen (2000) establishes that fiscal incentives for R&D consistently raise R&D spending, with a typical user-cost elasticity close to -1 across a wide range of countries and estimation methods. This benchmark is confirmed by subsequent panel evidence: using nine OECD countries over 1979–1997, Bloom et al. (2002) estimate a long-run user-cost elasticity of approximately unity. Guceri and Liu (2019) sharpen identification using a UK firm-size threshold in R&D tax credit eligibility and find that R&D expenditure rises by roughly 6 % per 1 % reduction in user cost. OECD estimates for 2019 confirm the aggregate magnitude of this channel across countries: among the 33 out of 37 OECD countries that offered expenditure-based R&D tax incentives that year, such provisions reduced the cost of capital by 3.5 percentage points and effective average tax rates by 8.8 percentage points on average (González Cabral et al., 2021). Because expenditure-based incentives act directly on the upfront cost of R&D investment—in contrast to income-based patent boxes, which operate on the revenue side—their impact on the intensive margin of R&D is larger and affects a broader range of firm types.

The most demanding causal evidence, from a regression-discontinuity design exploiting a UK policy reform, confirms that R&D tax relief more than doubled firm-level R&D and raised patenting by approximately 60 %, with significant positive spillovers to technologically adjacent firms (Dechezleprêtre et al., 2023). Broader historical evidence further shows that high personal income taxes on inventors reduce patenting and trigger the emigration of talent (Akcigit et al., 2022), underscoring the importance of the full tax environment for innovative activity.

Patent boxes—reduced corporate tax rates on income derived from intellectual property—represent a second instrument for promoting innovation and are now in place in 19 European countries (Haufler and Schindler, 2023). Early cross-country evidence by Bradley et al. (2015) documents that patent boxes shift patent ownership toward low-tax jurisdictions, particularly for larger firms, while Alstadsæter et al. (2018) show on EU panel data that the effect on genuine domestic R&D depends critically on whether nexus requirements—which tie the benefit to local economic activity—are enforced.

OECD forward-looking ETR estimates for 2021 put the effective magnitude of these regimes in sharp relief: among the 16 out of 27 EU countries offering income-based tax incentives for R&D intangibles that year, such regimes reduced the EATR on internally generated IP from an average of 19.8 % to 6.4 %—a reduction of 13.4 percentage points (González Cabral et al., 2023). Their effect on the cost of capital—and hence on the intensive margin of R&D investment—is considerably smaller, however, falling from 4.2 % to 3.5 %, because patent boxes operate on the income side of the investment rather than on its upfront cost. The nexus ratio introduced by BEPS Action 5, which ties the share of qualifying income to the share of R&D expenditure incurred by the taxpayer itself or outsourced to unrelated parties, substantially curtails the benefit for firms that rely on intra-group R&D outsourcing: these firms face an EATR seven percentage points higher than firms conducting R&D in-house (González Cabral et al., 2023).

Haufler and Schindler (2023) show theoretically that patent boxes emerge endogenously under tax competition as countries attempt to attract mobile patent income, but are globally suboptimal relative to a coordinated policy that relies instead on direct R&D subsidies, because they facilitate profit shifting without a commensurate gain in domestic innovation. This ambivalence— patent boxes as both innovation incentive and profit-shifting vehicle—motivates the ITCI's detailed scoring of the nexus requirements and rate levels that determine how growth-enhancing a country's patent box actually is.

Allowance for corporate equity. Many corporate tax systems favour debt over equity finance by allowing interest deductions but not a return on equity. An allowance for corporate equity (ACE) corrects this asymmetry by granting a notional deduction equal to the normal return on equity capital, thereby eliminating the tax penalty on equity- financed investment. Klemm (2007) surveys ACE systems implemented in Belgium, Brazil, Croatia, and Italy and documents investment-promoting effects alongside a reduction in the debt-equity distortion, though the precise magnitude of the investment response depends on complementary features of the tax code.

Loss treatment.. The tax value of an investment depends on whether losses can be offset against profits in other periods. Asymmetric tax treatment that restricts loss carry-overs raises the effective tax rate on risky projects and discourages investment in new technologies. Langenmayr and Lester (2018) find that one additional year of loss carryback entitlement is associated with 11.6 % higher corporate risk-taking, because carryback provisions deliver an immediate cash refund rather than a deferred future deduction; carryforward provisions, by contrast, provide only a 2.4 % increase in risk-taking per additional year. Generous loss treatment therefore directly supports the investment decisions that are most sensitive to the intertemporal structure of the tax code.

Tax complexity. Beyond the specific rate and base provisions, the overall complexity of the corporate tax code matters independently. Zwick (2021) shows, using 1.2 million US corporate tax returns, that only 37 % of eligible firms successfully claim loss refunds to which they are legally entitled, with take-up rising sharply among firms that employ sophisticated tax advisers. Higher complexity thus reduces the effective investment stimulus delivered by any given set of statutory incentives—a finding that is directly reflected in the ITCI's inclusion of a complexity sub-component (number of rates, alternative minimum taxes, and surtaxes) alongside the substantive rate and base measures.

Synthesis. Taken together, these strands of evidence suggest a coherent mechanism behind the aggregate result. Improvements in the ITCI corporate pillar capture reforms across all of the above dimensions: a lower statutory rate, more generous cost recovery, stronger R&D incentives, an ACE provision, more symmetric loss treatment, or reduced complexity. Each of these features independently lowers the user cost of capital, raises after-tax returns on investment and innovation, or removes distortions to financing and risk-taking. That the growth effect manifests contemporaneously and then builds over a three-year horizon is consistent with models in which firms' investment plans are forward-looking but adjustment takes time (Zwick and Mahon, 2017; Maffini et al., 2019). The absence of significant growth effects for the other four ITCI pillars is also broadly consistent with the theoretical prediction that taxes on mobile capital—the primary subject of the corporate pillar—generate larger distortions to investment and factor allocation than taxes on labor income, consumption, or immovable property (Arnold et al., 2011; Gechert and Heimberger, 2022). This prediction traces back to the zero-optimal-capital-tax results of Chamley (1986) and Judd (1985); while Straub and Werning (2020) show that positive capital taxation can be optimal under empirically plausible parameterisations, the qualitative primacy of mobile capital taxes for growth distortions—especially in open economies with free capital flows—remains intact.

6. Conclusions

This paper examines whether the design of a country's tax system matters for economic growth, using the Tax Foundation's International Tax Competitiveness Index (ITCI) as a multidimensional, legislated-features-based measure of tax system quality. By moving beyond headline statutory rates—the focus of most prior work, including Kawano et al. (2025)—and capturing the full structure of corporate, individual income, consumption, property, and cross-border tax rules across 23 European and comparable OECD economies over the period 2014–2024, we are able to assess which dimensions of tax competitiveness are most relevant for growth.

Three main findings emerge. First, improvements in aggregate tax competitiveness are positively and significantly associated with real GDP per capita growth across static fixed-effects specifications, a result that holds after conditioning on convergence dynamics, FDI inflows, human capital, pre-tax inequality, redistribution, institutional quality, and investment shares. This stands in contrast to the null results of Kawano et al. (2025) for top statutory rates, and suggests that the broader structural features of the tax system captured by the ITCI contain information about the tax system that top rates alone do not. Second, decomposing the index into its five components reveals that the aggregate growth effect is driven almost entirely by the corporate tax dimension. Improvements in corporate tax competitiveness—encompassing not just the statutory rate but also cost recovery rules, loss carryforwards, patent box regimes, and complexity—are robustly associated with higher growth across all static and dynamic specifications. The remaining pillars—consumption, individual income, property, and cross-border taxes—do not display statistically significant growth effects at conventional levels, with only the property tax component approaching marginal significance in the most richly controlled specifications. Third, the dynamic analysis shows that the growth effect of corporate tax competitiveness is not limited to a contemporaneous response: the cumulative impact grows over time and is most precisely estimated at the three-year horizon, with a statistically significant cumulative effect of approximately 0.16 percentage points per one-point improvement in the corporate tax score.

These findings carry several implications. From a measurement perspective, the results support the use of composite, design-based tax indices in cross-country growth research. The null result for top statutory rates in Kawano et al. (2025) may partly reflect that rates may be to coarse to summary the investment incentives embedded in the tax code; the ITCI's richer characterization of base rules and structural features appears to capture additional variation that is relevant for growth. From a policy perspective, the concentration of growth effects in the corporate tax pillar is consistent with the theoretical channels emphasized in the investment and capital allocation literature: firms' forward-looking investment decisions are sensitive to the overall tax burden on returns to capital, which depends on the combination of rates, depreciation rules, loss treatment, and international provisions, rather than the headline rate alone. Governments seeking to improve growth performance through tax reform should therefore attend to the full architecture of the corporate tax system, not merely the statutory rate.

Several caveats and avenues for future research deserve mention. The ITCI covers European economies from 2014 onward, which limits both the cross-sectional and time-series variation available for identification. The sample period encompasses the post-financial-crisis recovery, the COVID-19 shock, and the initial years of the OECD global minimum tax framework, all of which may influence the estimated coefficients in ways that are difficult to fully control for. Future work could extend the analysis to a longer time series as the ITCI is updated, explore heterogeneity in the corporate tax effect across country income levels or institutional environments, and examine whether specific sub-components of the corporate pillar—such as cost recovery generosity or the presence of a patent box—drive the estimated effect. The potential interaction between the global minimum tax and domestic corporate tax competitiveness also represents a timely and policy-relevant extension of the present analysis.

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