

State Tax Reforms in a Federalist System

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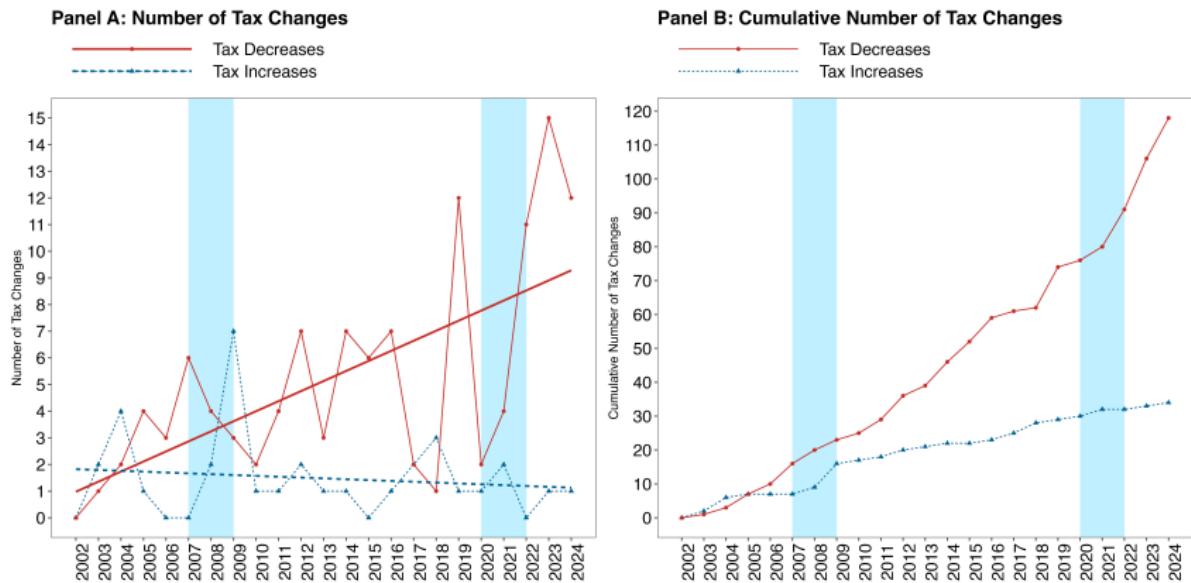
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Introduction

- This paper provides an exploration on the determinants of state personal income tax (PIT) reforms.
- In particular, we focus on the influence that Federal IG revenues have on the probability of increasing/decreasing top PIT rates.
- We provide a characterization of long-term trends on state income tax reforms.
- Empirical analysis: all state governments from 2002 to 2019.

Since the early 2000, we have observed a rising trend on cuts on the top PIT rate.

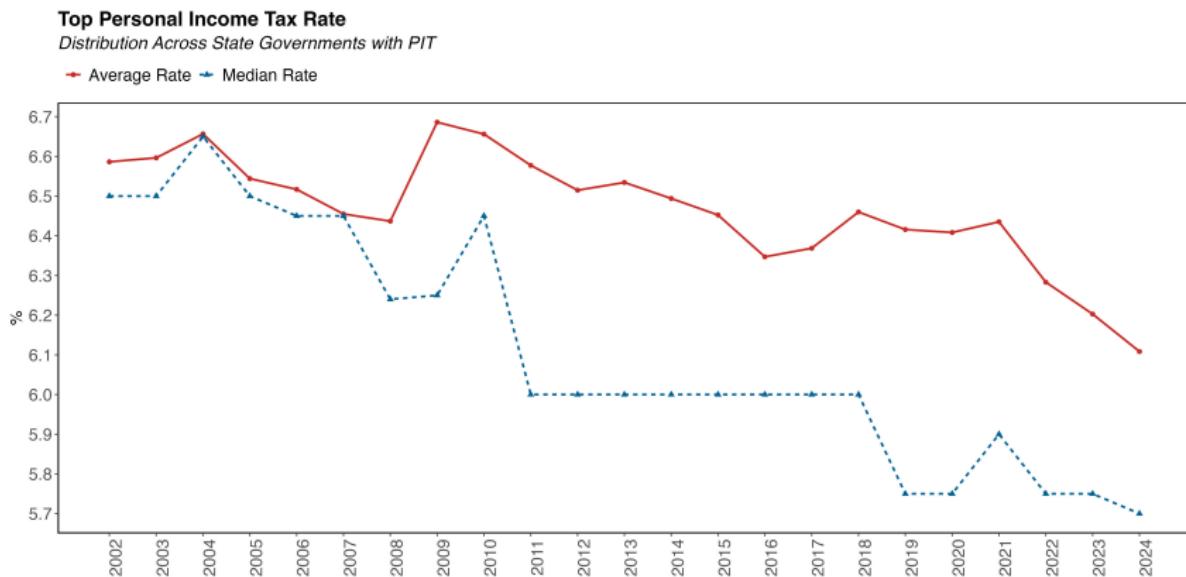
Figure: Changes on top PIT rates



Source: Figure 1 at [Johnson et al. \(2024\)](#).**Note:** Calculations exclude states without a PIT rate. Tax changes for 2002 are not included since our analysis starts on this date. Panel A shows the number of tax changes observed in each year. Panel B shows the cumulative sum of the number of tax changes observed in each year. Both panels show individual lines according to the type of tax policy implemented (i.e., tax increase or tax decrease). Shaded areas correspond to the period of the Great Recession and the COVID-19 pandemic emergency.

This has translated in a decrease on the average (and median) state top PIT rates.

Figure: Trends on the top PIT Rate



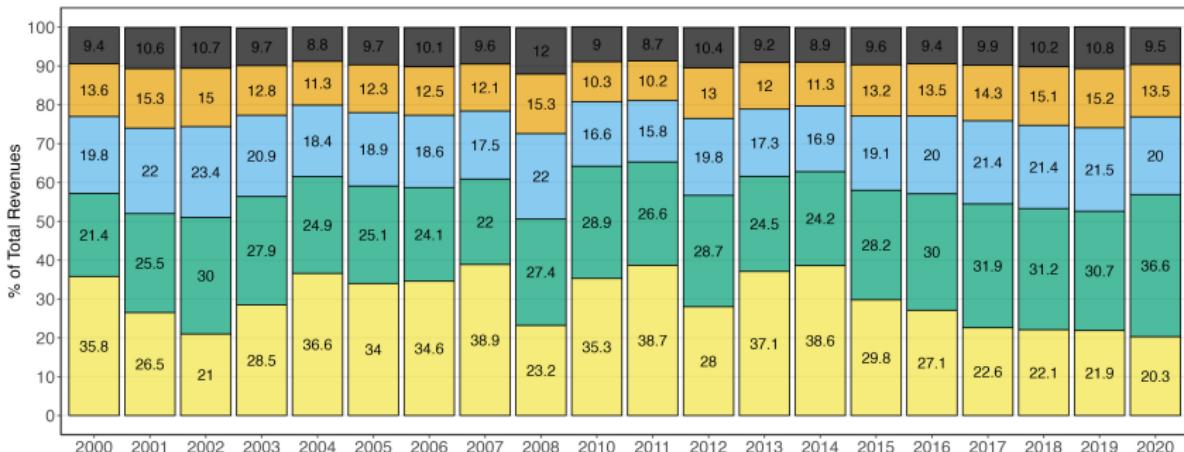
Note: This graph shows the average (and median) top PIT rate across states that levy a personal income tax.

Figure: Fiscal Structure of State Governments

State Governments Fiscal Structure

Revenues Sources as % of Total State Revenue

█ Other Revenues
 █ Sales Taxes
 █ Charges and Misc Rev
█ Ind Income Taxes
 █ Fed IG Revenues Census



Note: This graph shows the composition of fiscal revenues of state governments between 2000 and 2020. Observations from 2009 are excluded due to inconsistency with the data. Numbers expressed as percentage of total fiscal revenues. Data from the Annual Survey (and Census) of Local Government Finances, retrieved from the Government Finance Database.

Decision Models: Econometric Specification

Choice (Probability) Models

1. **Binary Probability Model:** binary decision problem in which the government chooses between: i) changing the top PIT rate or ii) keep it constant.

$$Pr(TaxChange_{i,t+1}) = \alpha + \theta FedIGRev_{it} + X_{it}\beta + b_t + e_{it} \quad (1)$$

2. **Multinomial Logit Model:** the government can choose from 3 alternatives: i) increase the tax rate, ii) decrease the tax rate; or iii) keep it constant.

$$\log\left(\frac{Pr(Decision_{i,t+1} = k)}{Pr(Decision_{i,t+1} = NoTaxChange)}\right) = \alpha + \theta FedIGRev_{it} + X_{it}\beta + b_t + e_{it} \quad (2)$$

Econometric Specification

- X_{it} : i) unemployment rate; ii) cash reserves (% revenues); iii) republican governor; iv) republican house; v) sales tax revenues (% revenues).
- Year fixed effects included. No state FE.

Binary Probability Model

Table: Effect of Federal IG Revenues on Probability of Tax Change

	(1)	(2)	(3)	(4)
Panel A: All Tax Changes				
Federal IG Revenue	-0.003 (0.003)	-0.006** (0.003)	-0.003 (0.002)	-0.007** (0.003)
N	738	738	738	738
Mean Dep Var	0.1396	0.1396	0.1396	0.1396
Panel B: Tax Decreases				
Federal IG Revenue	-0.002 (0.002)	-0.004* (0.002)	-0.002 (0.002)	-0.005* (0.002)
N	709	709	709	709
Mean Dep Var	0.1044	0.1044	0.1044	0.1044
Panel C: Tax Increases				
Federal IG Revenue	-0.001 (0.001)	-0.003 (0.002)	-0.002** (0.001)	-0.004*** (0.001)
N	664	664	664	664
Mean Dep Var	0.0437	0.0437	0.0437	0.0437
Year FE Estimator	No Linear	Yes Linear	No Logit	Yes Logit

Note: This table shows the marginal effects of an increase on Federal IG Revenues equivalent to 1% of state's fiscal revenues on the probability of changing their top PIT rate. Columns (1) and (2) show the coefficients from Equation 1 using an OLS estimator. Columns (3) and (4) show the results from a logistic regression. Panel A shows results from estimating the models on the full sample. Panel B and Panel C restrict this sample by excluding the observations with tax increases and tax decreases, respectively. Standard errors are clustered at the state level. A */**/*** indicates significance at the 10%, 5%, and 1% levels, respectively.

Multinomial Probability Model

Table: Multinomial Logit Models on Pr(Tax Change) - Effect of Federal IG Revenues

Variable	Tax Decrease (1)	Tax Decrease (2)	Tax Increase (1)	Tax Increase (2)
Federal IG Revenue	-0.0021 (0.002)	-0.0043** (0.0025)	-0.0016* (0.001)	-0.003** (0.0013)
Year FE	No	Yes	No	Yes
Pr(Tax Change)	0.1003	0.1003	0.0393	0.0393

Note: This table shows the results of estimating Equation 2. The excluded reference group is "No Tax Change". The table shows the marginal effects of states choosing to increase (or decrease) the top PIT rate, relative to keeping it constant. Standard errors computed using a cluster bootstrap algorithm (clusters by state). A */**/*** indicates significance at the 10%, 5%, and 1% levels, respectively.

Definition (Long-term Income Tax Policy Classification)

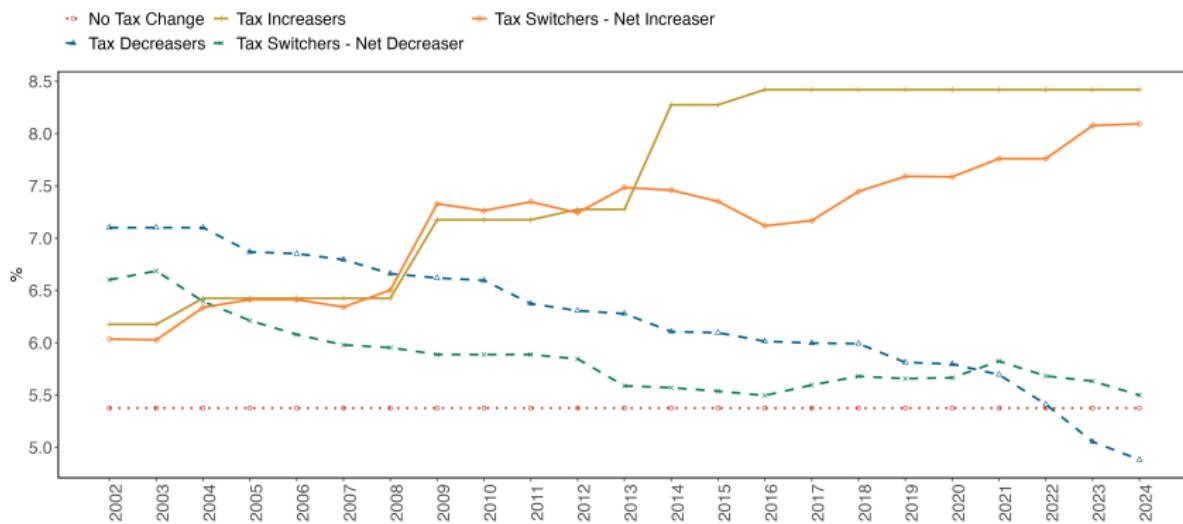
Considering the trajectory of each state's i top PIT rate τ_{it} , we assign the state to one of the following income tax policy categories.

1. **No PIT Rate:** states that do not levy a personal income tax.
2. **No Tax Change:** the PIT rate remained constant through all periods.
3. **Tax Decreasers:** The PIT rate is monotonically decreasing over time. All changes on the PIT rate were negative.
4. **Tax Increases:** The PIT rate is monotonically increasing over time. All changes on the PIT rate were positive.
5. **Tax Switchers - Net Decreasers:** changes on the PIT rate were either positive or negative, but the net change (cumulative sum of tax changes) is negative.
6. **Tax Switchers - Net Increases:** changes on the PIT rate were either positive or negative, but the net change (cumulative sum of tax changes) is positive.

Figure: Average Top PIT Rate by Long Term Income Tax Policy Group: 2002-2024

Income Tax Rate by Tax Policy Group

Average Top PIT Rate across groups

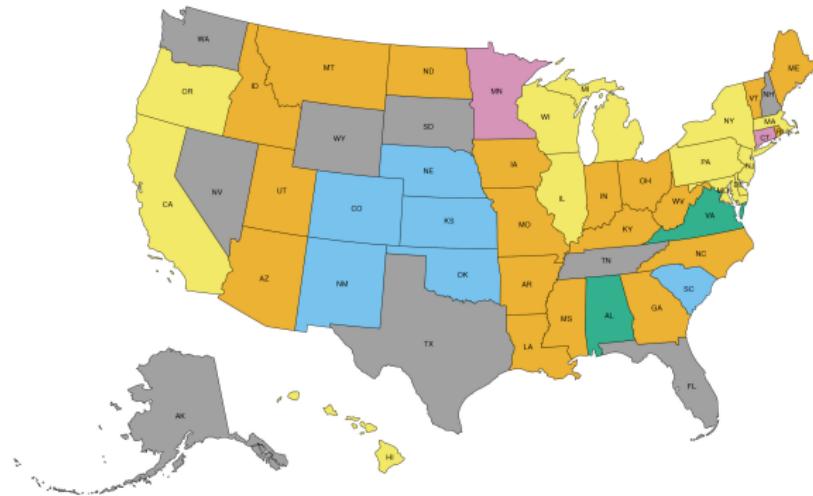


Note: this graph shows the average PIT rate for each income tax policy category, according to the long-term classification described at Map 5 (according to Definition 1).

Figure: Long Term Income Tax Policy Classification: 2002-2024

States by Type of Income Tax Policy: 2002-2024

No PIT Rate	Tax Switchers - Net Decreaser	Tax Switchers - Net Inimizer
Tax Decreasers	No Tax Change	Tax Increases



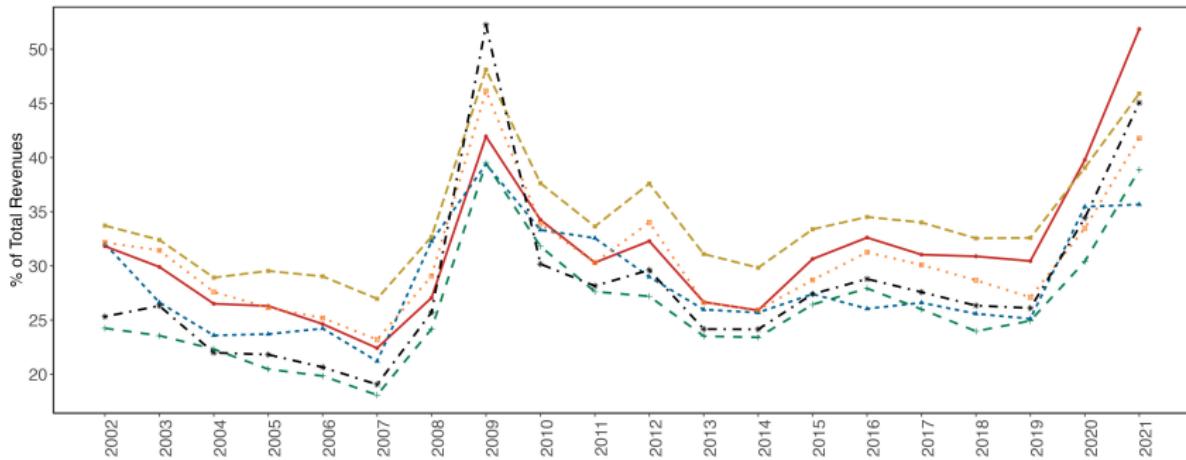
Note: this map shows the long-term classification of states income tax policy using the categorization algorithm described at Definition 1.

Figure: Average Federal IG Revenues by Income Tax Policy Group

Operating and Capital Grant Funding by Income Tax Group

Percentage of Total Fiscal Revenues

- No PIT Rate
- Tax Decreasers
- Tax Switchers - Net Decreaser
- No Tax Change
- Tax Increases
- Tax Switchers - Net Inquirer



Note: This graph shows the average Federal IG Revenues (as percentage of total fiscal revenues) across the states belonging to each income tax category on the long-term income tax policy classification.

Multinomial Logit Model

We estimate the probability of assigning state's income tax policy into one of the defined categories k , relative to being assigned as a no tax change (k_0).

$$\log \left(\frac{Pr(y_{i,t+1} = k)}{Pr(y_{i,t+1} = k_0)} \right) = \alpha + \theta FedIGRev_{it} + X_{it}\beta + b_t + e_{it} \quad (3)$$

- Dependent variables: i) Fixed (Long Term) Classification; ii) Time Varying (Dynamic) Classification.

Figure: Dynamic Income Tax Policy Classification

Time Varying Classification

■ Tax Decreasers ■ Tax Switchers - Net Decreaser ■ No Tax Change ■ Tax Switchers - Net Inerer ■ Tax Increases



Note: This graph shows the sorting process implied by the dynamic income tax policy classification for selected states. This is the time-varying classification used as dependent variable for the classification model.

Classification Models - Results

Table: Effect of Federal IG Revenues on Income Tax Policy Classification

Model	Tax Decreasers	Tax Switchers Net Decreaser	Tax Switchers Net Increaser	Tax Increases
Fixed Class.				
Controls	0.0279*** (0.0049)	0.0012 (0.0033)	-0.0221*** (0.004)	-0.0055 (0.0034)
Controls + Year FE	0.0366*** (0.0049)	0.0026 (0.0045)	-0.0302*** (0.0078)	-0.007* (0.0067)
Pr(Tax Classification)	0.4634	0.1463	0.2927	0.0488
Time Varying Class.				
Controls	0.0078*** (0.0047)	-0.0002 (0.0023)	-0.0066** (0.0031)	-0.0083*** (0.0036)
Controls + Year FE	0.0072*** (0.0062)	0.000 (0.0032)	-0.0138*** (0.0066)	-0.0106*** (0.0059)
Pr(Tax Classification)	0.2900	0.0298	0.1436	0.1192

Note: This table shows the results from Equation 3. Columns show the categories (alternatives) of the classification model. Rows show the results (average marginal effects) of the model under different dependent variables (fixed classification, time-varying classification) and econometric specifications (controls, controls and year fixed effects). Fixed classification corresponds to the model using as dependent variable the income tax policy categorization computed using data from 2002-2023. See Definition 1. Time Varying classification corresponds to the categorization updated annually. See Definition ???. Standard errors computed using a cluster bootstrap algorithm (clusters by state). A */**/** indicates significance at the 10%, 5%, and 1% levels, respectively.

Simplified Classification Model

We simplify the dynamic classification algorithm to collapse it into 3 categories: i) net tax increaser, ii) net tax decreaser, and iii) no tax change. We estimate Equation 3 using this as dep var.

Table: Effect of Federal IG Revenues on Simplified Income Tax Policy Classification

Variable	Net Tax Decreasers (1)	Net Tax Decreasers (2)	Net Tax Increasers (1)	Net Tax Increasers (2)
Federal IG Revenue	0.0078*** (0.0062)	0.0059** (0.0062)	-0.0146*** (0.0054)	-0.0228*** (0.0054)
Year FE Pr(Tax Classification)	No 0.3198	Yes 0.3198	No 0.2629	Yes 0.2629

Note: This table shows the results from Equation 3 estimated using as dependent variable the simplified version of the time-varying classification. See Definition ???. Coefficients show the marginal effect on the probability of being classified into one of the categories (Net Tax Decreaser or Net Tax Increaser) of an increase of federal IG revenues equivalent to one percentage points of fiscal revenues. Standard errors computed using a cluster bootstrap algorithm (clusters by state). A */**/** indicates significance at the 10%, 5%, and 1% levels, respectively.

Summary of marginal effects of an increase in federal IG revenues equivalent to 1% of fiscal revenues.

Table: Summary of Results

Model	Tax Policy	Marginal Effect (A)	Mean Dep.Var. (B)	Implied Eff (%; C = A/B)
Decision.Mod:Binary Logit	All Tax Changes	-0.007**	0.1396	-5.0143
Decision.Mod:Binary Logit	Tax Decreases	-0.005*	0.1044	-4.7893
Decision.Mod:Binary Logit	Tax Increases	-0.004***	0.0437	-9.1533
Decision.Mod:Multinomial Logit	Tax Decreases	-0.0043**	0.1003	-4.2871
Decision.Mod:Multinomial Logit	Tax Increases	-0.003**	0.0393	-7.6336
Classif.Mod:Long Term	Tax Decreasers	0.0366***	0.4634	7.8979
Classif.Mod:Long Term	Tax Switchers - Net Decreaser	0.0026	0.1463	1.7767
Classif.Mod:Long Term	Tax Switchers - Net Increaser	-0.0302***	0.2927	-10.3183
Classif.Mod:Long Term	Tax Increases	-0.007*	0.0488	-14.3500
Classif.Mod:Time Varying	Tax Decreasers	0.0072***	0.2900	2.4830
Classif.Mod:Time Varying	Tax Switchers - Net Decreaser	0.000	0.0298	0.0000
Classif.Mod:Time Varying	Tax Switchers - Net Increaser	-0.0138***	0.1436	-9.6079
Classif.Mod:Time Varying	Tax Increases	-0.0106***	0.1192	-8.8895
Classif.Mod:Time Varying Simplified	Net Tax Decreasers (2)	0.0059**	0.3198	1.8449
Classif.Mod:Time Varying Simplified	Net Tax Increases (2)	-0.0228***	0.2629	-8.6725

Note: This table summarizes the results of all econometric models. All reported models include year fixed effects. Reported implied effect is computed as the ratio of the marginal effect (A) and the in-sample probability of observing the outcome (mean of dependent variable, B), multiplied by 100 to express in percentage points. To be clear: $C = 100*(A/B)$. Standard errors computed using a cluster bootstrap algorithm (clusters by state). A */**/*** indicates significance at the 10%, 5%, and 1% levels, respectively.

Discussion and Next Steps

- There is a long-term trend on decreasing PIT rates among state governments.
 - ▶ Tax competition (race to the bottom incentives) ([Keen, 1998](#); [Zodrow and Mieszkowski, 1986](#))
 - ▶ Policy diffusion.
- We document a negative relationship between federal IG revenues and the probability of changing state PIT rates.
 - ▶ Political costs ([Bradford and Oates, 1971a,b](#)).
- Larger reliance on federal IG revenues reduces the likelihood of net tax increases and viceversa (increases the likelihood of net tax decreases).
 - ▶ Flypaper effect and fiscal replacement ([Gramlich, 1987](#)): governments are more likely to expand spending than cutting taxes, upon an increase in grants.
 - ▶ Fiscal space ([Heller, 2005](#)): increase in federal grants has been enough to boost spending (flypaper effect) and reduce taxes.
- **Next Steps:** examine tax competition mechanisms, and alternative measures of federal grants (i.e. remove earmarked grants, including Medicaid payments).
- **Suggestions:** best framing for the paper? related literature?

Thanks for your attention!

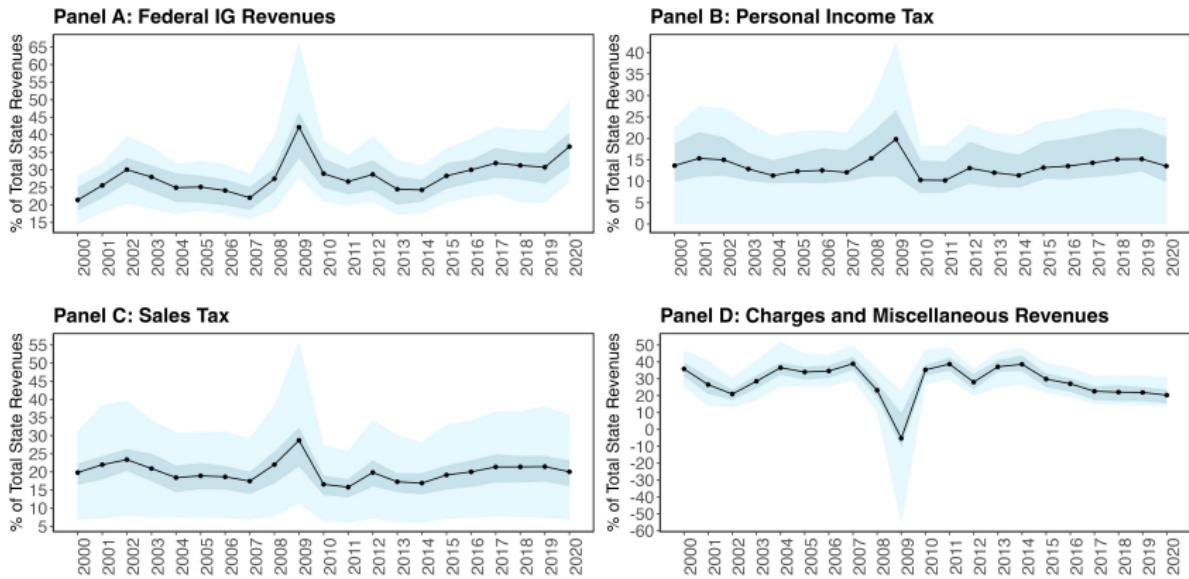
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Appendix

Figure: Distribution of Federal IG Transfers and Personal Income Tax Revenues across states



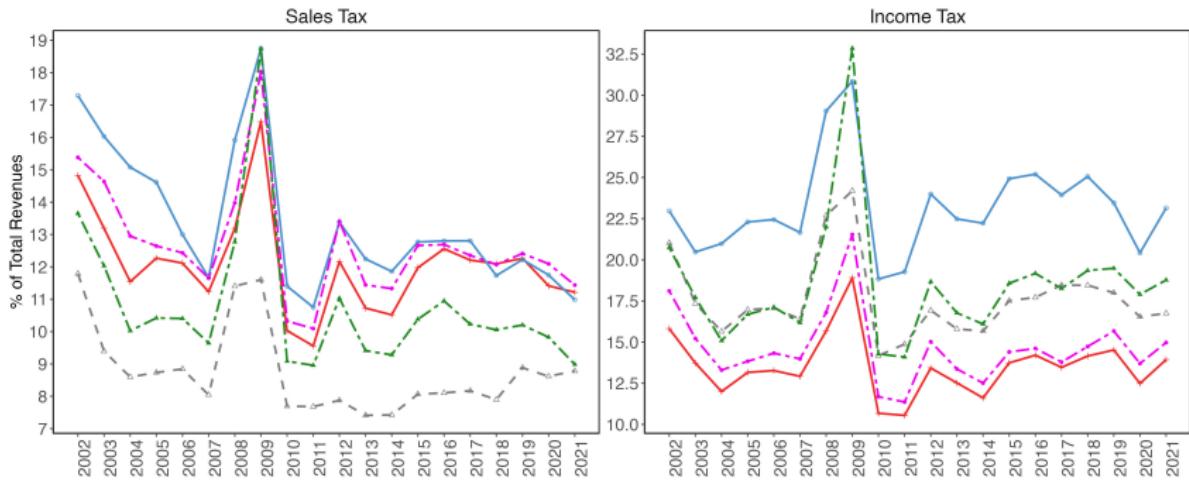
Note: These panels show the distribution of the main revenue categories of state governments. Each panel shows the distribution of a revenue variable across states and years. All variables are expressed as percentage of total fiscal revenues. The solid line represents the average of the variable across states on any given year. The darker shaded area shows the 25% and 75% percentiles of the distribution across states. The lighter shaded shows the area surrounding the 5% and 95% percentiles of distribution across states.

Figure: Main Fiscal Indicators by Income Tax Policy Classification (1)

Main Fiscal Indicators by Income Tax Policy Group

State Average within Category (% Total Revenues)

→ No Tax Change → Tax Decreasers → Tax Increases → Tax Switchers - Net Decreaser → Tax Switchers - Net Increase



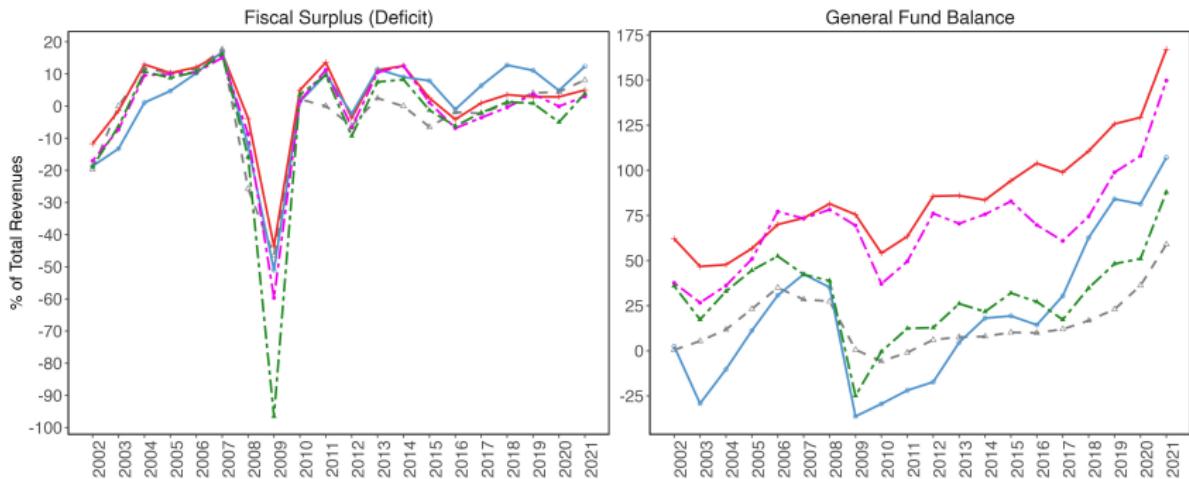
Note: These panels show the average of the main fiscal indicators across the tax policy groups defined using Definition 1. All variables are expressed as percentage of state total revenues. States without a PIT rate are excluded.

Figure: Main Fiscal Indicators by Income Tax Policy Classification (2)

Main Fiscal Indicators by Income Tax Policy Group

State Average within Category (% Total Revenues)

- No Tax Change → Tax Decreasers → Tax Increases → Tax Switchers - Net Decreaser → Tax Switchers - Net Increase



Note: These panels show the average of the main fiscal indicators across the tax policy groups defined using Definition 1. All variables are expressed as percentage of state total revenues. States without a PIT rate are excluded.

Figure: Main Fiscal Indicators by Income Tax Policy Classification (3)

Main Fiscal Indicators by Income Tax Policy Group

State Average within Category (% Total Revenues)

→ No Tax Change → Tax Decreasers → Tax Increases → Tax Switchers - Net Decreaser → Tax Switchers - Net Increase



Note: These panels show the average of the main fiscal indicators across the tax policy groups defined using Definition 1. All variables are expressed as percentage of state total revenues. States without a PIT rate are excluded.

Descriptive Statistics

Table: Descriptive Statistics of Baseline Sample

	Mean	SD	Min	P25	P50	P75	Max	Obs
Federal IG Revenue	30.25	8.79	0.00	24.79	29.53	33.97	113.08	738
Sales Tax	11.81	5.26	0.00	9.38	11.66	14.59	47.94	738
Cash Reserves (% Revenue)	176.91	69.42	66.48	133.96	168.87	202.89	905.24	738
Unemployment Rate	5.64	2.01	2.10	4.20	5.20	6.70	13.10	738
Republican House	0.49	0.50	0.00	0.00	0.00	1.00	1.00	738
Republican Governor	0.53	0.50	0.00	0.00	1.00	1.00	1.00	738
<i>Auxiliary Variables</i>								
Income Tax	15.86	6.20	4.09	11.88	14.88	19.48	70.10	738
Top PIT Rate	6.52	1.97	2.80	5.00	6.00	7.75	13.30	738
GF Balance (% Revenue)	54.73	89.60	-318.32	11.76	41.69	86.68	812.97	738

Note: This table shows the distribution of the main explanatory variables used for the analysis. Each column shows a moment or descriptive statistics on the distribution across the strongly balanced panel of state governments that levy a personal income tax from 2002 to 2019. P25, P50 and P75 denote the 25th, 50th (median), and 75th percentiles of the distribution.

Binary Choice Model (1)

Table: Coefficient Estimates on the Probability of Tax Change - Full Sample

Variable	(1)	(2)	(3)	(4)
Federal IG Revenue	-0.003 (0.003)	-0.006** (0.003)	-0.003 (0.002)	-0.007** (0.003)
Sales Tax	0.004** (0.002)	0.006** (0.002)	0.004** (0.002)	0.004** (0.002)
Unemployment Rate	0.001 (0.009)	-0.001 (0.012)	0.001 (0.009)	0.002 (0.012)
Cash Reserves (% Revenue)	0.001** (0.000)	0.001*** (0.000)	0.000** (0.000)	0.001*** (0.000)
Republican Governor	-0.003 (0.034)	0.002 (0.033)	-0.003 (0.033)	0.005 (0.034)
Republican House	-0.008 (0.034)	-0.018 (0.035)	-0.008 (0.034)	-0.016 (0.035)
N	738	738	738	738
Mean Dep Var	0.1396	0.1396	0.1396	0.1396
Year FE	No	Yes	No	Yes
Estimator	OLS	OLS	Logit	Logit

Note: This table shows the marginal effects of an increase on Federal IG Revenues equivalent to 1% of state's fiscal revenues on the probability of changing their top PIT rate. **Model estimated on the full panel of states from 2002-2019.** Columns (1)-(3) show the coefficients from Equation 1 using an OLS estimator. Columns (4)-(6) show the results from a logistic regression. Panel A shows results from estimating the models on the full sample. Standard errors are clustered at the state level. A */**/** indicates significance at the 10%, 5%, and 1% levels, respectively.

Binary Choice Model (2)

Table: Coefficient Estimates on the Probability of Tax Change - Tax Increases

Variable	(1)	(2)	(3)	(4)
Federal IG Revenue	-0.001 (0.001)	-0.003 (0.002)	-0.002** (0.001)	-0.004*** (0.001)
Sales Tax	0.005*** (0.002)	0.005*** (0.002)	0.004*** (0.001)	0.003** (0.001)
Unemployment Rate	0.008* (0.004)	0.007 (0.005)	0.007** (0.003)	0.006 (0.004)
Cash Reserves (% Revenue)	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	0.000*** (0.000)
Republican Governor	-0.025 (0.017)	-0.024 (0.015)	-0.021 (0.015)	-0.021 (0.014)
Republican House	-0.050*** (0.016)	-0.056*** (0.017)	-0.052*** (0.016)	-0.057*** (0.016)
N	664	664	664	664
Mean Dep Var	0.0437	0.0437	0.0437	0.0437
Year FE	No	Yes	No	Yes
Estimator	OLS	OLS	Logit	Logit

Note: This table shows the marginal effects of an increase on Federal IG Revenues equivalent to 1% of state's fiscal revenues on the probability of changing their top PIT rate. **Model estimated on the full panel of states from 2002-2019, excluding observations with a negative tax change.** Columns (1)-(3) show the coefficients from Equation 1 using an OLS estimator. Columns (4)-(6) show the results from a logistic regression. Panel A shows results from estimating the models on the full sample. Standard errors are clustered at the state level. A */**/*** indicates significance at the 10%, 5%, and 1% levels, respectively.

Binary Choice Model (3)

Table: Coefficient Estimates on the Probability of Tax Change - Tax Decreases

Variable	(1)	(2)	(3)	(4)
Federal IG Revenue	-0.002 (0.002)	-0.004* (0.002)	-0.002 (0.002)	-0.005* (0.002)
Sales Tax	0.000 (0.002)	0.001 (0.003)	0.000 (0.002)	0.001 (0.003)
Unemployment Rate	-0.006 (0.008)	-0.008 (0.012)	-0.007 (0.009)	-0.004 (0.012)
Cash Reserves (% Revenue)	0.000 (0.000)	0.001* (0.000)	0.000 (0.000)	0.001* (0.000)
Republican Governor	0.017 (0.029)	0.021 (0.030)	0.018 (0.029)	0.022 (0.032)
Republican House	0.037 (0.034)	0.028 (0.034)	0.037 (0.033)	0.029 (0.035)
N	709	709	709	709
Mean Dep Var	0.1044	0.1044	0.1044	0.1044
Year FE	No	Yes	No	Yes
Estimator	OLS	OLS	Logit	Logit

Note: This table shows the marginal effects of an increase on Federal IG Revenues equivalent to 1% of state's fiscal revenues on the probability of changing their top PIT rate. **Model estimated on the full panel of states from 2002-2019, excluding observations with a positive tax change.** Columns (1)-(3) show the coefficients from Equation 1 using an OLS estimator. Columns (4)-(6) show the results from a logistic regression. Panel A shows results from estimating the models on the full sample. Standard errors are clustered at the state level. A */**/*** indicates significance at the 10%, 5%, and 1% levels, respectively.

Multinomial Choice Model

Table: Multinomial Logit Model on Tax Changes - Marginal Effects on Explanatory Variables

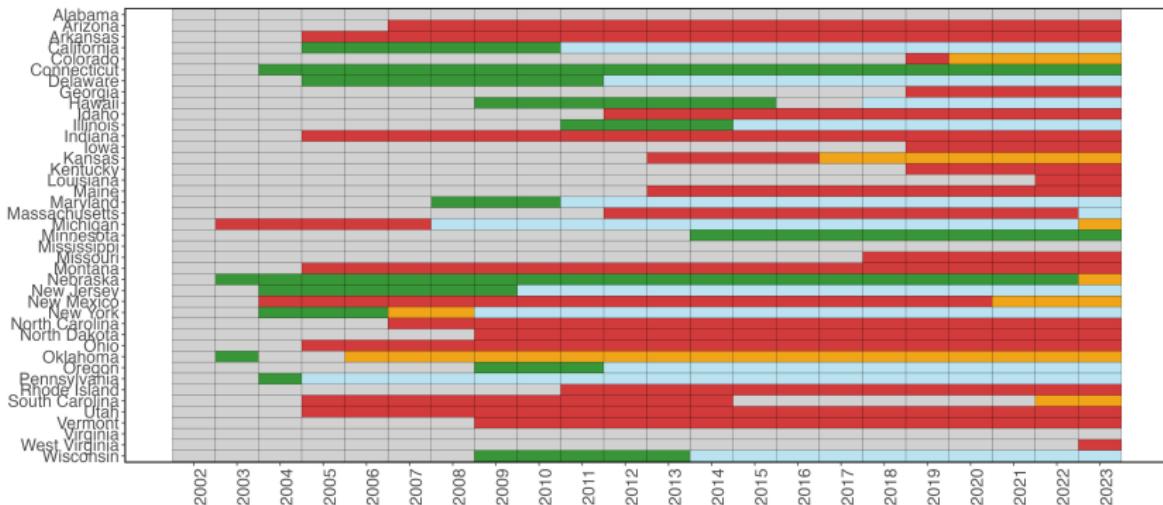
Variable	Tax Decrease (1)	Tax Decrease (2)	Tax Increase (1)	Tax Increase (2)
Federal IG Revenue	-0.0021 (0.002)	-0.0043** (0.0025)	-0.0016* (0.001)	-0.003** (0.0013)
Cash Reserves (% Revenue)	0.0001 (0.0003)	0.0006** (0.0004)	0.0002* (0.0001)	0.0003** (0.0001)
Sales Tax	-0.0008 (0.0024)	0.0003 (0.003)	0.0033** (0.0019)	0.0029** (0.002)
Unemployment Rate	-0.007 (0.0088)	-0.0047 (0.0131)	0.006* (0.0026)	0.0054 (0.0047)
Republican Governor	0.0193 (0.0288)	0.0229 (0.0319)	-0.0177 (0.0143)	-0.0166 (0.0143)
Republican House	0.04* (0.0331)	0.0335 (0.0353)	-0.0484*** (0.0156)	-0.052*** (0.017)
Year FE	No	Yes	No	Yes
Pr(Tax Change)	0.1003	0.1003	0.0393	0.0393

Note: Columns Tax Dec and Tax Inc show the exponential-transformation of the coefficient estimates ($\exp \beta$) on the effect of Federal IG Revenues on the probability of choosing to decrease and increase the top PIT rate, respectively. In both cases, the probability is relative to keeping them constant (reference category). Tax Dec (1) and Tax Inc (1) show the results from estimating Equation 2 using a multinomial logit model. Tax Dec (2) and Tax Inc (2) add year dummy variables to the estimating equation. Standard errors are clustered at the state level and are computed using a cluster-bootstrapping algorithm. Reported standard errors correspond to the raw coefficient estimates, not the reported exponential transformation. A */**/** indicates significance at the 10%, 5%, and 1% levels, respectively. Pr(Tax Change) shows the in-sample proportion of tax changes.

Figure: Time Varying Classification of Income Tax Policy

Time Varying Classification

■ Tax Decreasers ■ Tax Switchers - Net Decreaser ■ No Tax Change ■ Tax Switchers - Net Incremental ■ Tax Increasers



Note: This graph shows the results of applying the algorithm at Definition [??](#). The graph depicts the sorting process implied by the dynamic income tax policy classification. States without a PIT rate are excluded.

Table: Income Tax Policy Classification - Marginal Effects on Explanatory Variables

Model	Tax Decreasers Net Decreaser	Tax Switchers Net Decreaser	Tax Switchers Net Inerer	Tax Increases
Fixed Class.				
Federal IG Revenue	0.0366*** (0.0049)	0.0026 (0.0045)	-0.0302*** (0.0078)	-0.007* (0.0067)
Cash Reserves (% Revenue)	-0.0012** (0.0011)	0.0001 (0.0014)	0.0021*** (0.0013)	-0.0005* (0.001)
Sales Tax	-0.0012 (0.0151)	0.0065 (0.011)	-0.0001 (0.0204)	0.0033 (0.0168)
Unemployment Rate	-0.0489*** (0.0478)	-0.0358*** (0.0489)	0.0794*** (0.0447)	0.0028 (0.036)
Republican Governor	0.0602 (0.0622)	0.0266 (0.0528)	-0.1013*** (0.0411)	-0.0113 (0.0349)
Republican House	0.1827*** (0.0783)	0.0223 (0.0965)	-0.2376*** (0.095)	-0.0211 (0.0827)
Pr(Tax Classification)	0.4634	0.1463	0.2927	0.0488
Time Varying Class.				
Federal IG Revenue	0.0072*** (0.0062)	0.000 (0.0032)	-0.0138*** (0.0066)	-0.0106*** (0.0059)
Cash Reserves (% Revenue)	0.0008** (0.001)	-0.0005** (0.0005)	0 (0.0006)	0.0011*** (0.0008)
Sales Tax	0.0069* (0.0133)	-0.002 (0.0041)	-0.0058** (0.0064)	0.0074* (0.0122)
Unemployment Rate	-0.019 (0.0365)	-0.0233** (0.0315)	0.0661*** (0.0241)	-0.0202** (0.0275)
Republican Governor	0.0718* (0.0496)	-0.0051 (0.0182)	-0.0255 (0.0475)	-0.0173 (0.0381)
Republican House	0.0899** (0.0729)	0.0479*** (0.0412)	-0.0957*** (0.0557)	-0.1573*** (0.0665)
Pr(Tax Classification)	0.29	0.0298	0.1436	0.1192

Note: This table shows the results from Equation 3. Columns show the categories (alternatives) of the classification model. Rows show the results (average marginal effects) of the model under two dep. variables (fixed classification, time-varying classification). Fixed classification corresponds to the model using as dependent variable the income tax policy categorization at Definition 1. Time Varying classification corresponds to the categorization updated annually under Definition ???. Reported results correspond

Linear Model on the Tax Rate

Table: Effect of Federal IG Revenues on States top PIT rate

Category	(1)	(2)	(3)
No Tax Change	-0.010 (0.010)	-0.017*** (0.000)	0.000
N	36	36	36
Mean Dep Var	0	0	0
Tax Decreasers	-0.019 (0.027)	-0.019 (0.043)	0.007 (0.011)
N	342	342	342
Mean Dep Var	0.1199	0.1199	0.1199
Tax Switchers - Net Increaser	-0.077 (0.051)	-0.141+ (0.069)	-0.048 (0.032)
N	216	216	216
Mean Dep Var	0.1806	0.1806	0.1806
Tax Switchers - Net Decreaser	-0.002 (0.022)	0.027 (0.041)	-0.030* (0.008)
N	108	108	108
Mean Dep Var	0.1667	0.1667	0.1667
Tax Increases	0.082 (0.023)	0.144*** (0.000)	0.097*** (0.000)
N	36	36	36
Mean Dep Var	0.1389	0.1389	0.1389
Year FE	No	Yes	Yes
State FE	No	No	Yes

Note: This table shows the coefficient estimates on the effect that federal IG revenues have on the state top PIT rate. We present 5 sets of estimates of θ from Equation ?? using a fixed effects estimator. Each set of coefficients correspond to the estimation of the model on the subset of states according to the long-term classification of their income tax policy. Standard errors are clustered at the state level. A */**/*** indicates State Tax Reforms in a Federalist System