# Online Appendix:
# Laffer Curves Are Flat

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# A Tax Bases, Top Marginal Tax Rates, and Elasticities

## A.1 Decomposing Behavioral Responses Across Tax Bases

A simple decomposition illustrates the behavioral responses driving differences in Laffer-curve shapes. Note that relative to this simplified analysis, the Laffer curves in this paper include additional general-equilibrium effects on taxpayers not subject to the top rate. Letting $\boldsymbol{\chi}$ denote the ordinary-income share of capital income (i.e., the share subject to the top tax rate), federal taxes from taxpayers in the top tax bracket include: ordinary income taxes not subject to the top rate ($Tax_0$), ordinary income taxes from wages ($\mathcal{W}$) and ordinary capital income ($\mathcal{K}$) in the top bracket, and preferential capital income taxes:

$$Tax_{top}(\tau_{top}) = Tax_0 + \tau_{top} \underbrace{(\mathcal{W} + \boldsymbol{\chi}\mathcal{K})}_{\text{ordinary income base}} \quad + \quad \tau_p \underbrace{(1 - \boldsymbol{\chi})\mathcal{K}.}_{\text{preferential income base}}$$

The narrow base ($\boldsymbol{\chi} = 0$) restricts the ordinary income base to only wages and exaggerates the preferential base, while the broad base ($\boldsymbol{\chi} = 1$) exaggerates the ordinary base and eliminates the preferential income base. For the true base in our model, $\boldsymbol{\chi}$ is endogenously determined based on the top tax rate. In our baseline model with the present-law top rate, the ordinary share is about $\boldsymbol{\chi} = 0.50$ for the top one percent of the income distribution (which approximates the top tax bracket). This is a non-targeted moment that approximates the $\boldsymbol{\chi} = 0.49$ observed in the tax data (when excluding negative capital income).

Differentiating the equation above, setting to zero, and rearranging implies that maximizing top taxes occurs for the top rate at which:

$$\underbrace{\mathcal{W} + \boldsymbol{\chi}\mathcal{K}}_{\text{mechanical effect}} = - \underbrace{\tau^*_{top}(\mathcal{W}' + \boldsymbol{\chi}\mathcal{K}')}_{\text{ordinary-base response}} - \underbrace{\tau_p(1 - \boldsymbol{\chi})\mathcal{K}'}_{\text{preferential-base response}} - \underbrace{\boldsymbol{\chi}'\mathcal{K}(\tau^*_{top} - \tau_p)}_{\text{composition response}} .$$

At this top rate, the mechanical effect of raising the tax rate should be offset by three responses.[1] First, both the broad and narrow bases fail to capture the "composition response". This response accounts for changes in the ordinary-preferential composition of capital income from sectoral shifts of real activity across the corporate and noncorporate sectors, which was described as the "portfolio effect" in Moore and Pecoraro (2021). Ignoring the composition response means the broad and narrow bases tend to overstate revenue-maximizing rates.[2] Second, the Laffer curves differ according to the ordinary-base response, which is relatively large for the broad base and relatively small for the narrow base,

[1] We thank Anmol Bhandari for suggesting the approach shown here.

[2] This occurs when $\boldsymbol{\chi}' < 0$ and $\tau^*_{top} > \tau_p$, which hold in this paper's simulations and are intuitive. The first inequality holds when an increase in the top tax decreases the ordinary-income share of capital income, which follows from a sectoral shift away from the noncorporate sector (directly affected by tax increases) and towards the corporate sector (not directly affected). The second inequality holds because

and the preferential-base response, which is exaggerated for the narrow base and eliminated for the broad base. Based on our simulation results (e.g., main paper Figure 1), these misspecifications: (i) result in an overstatement of the narrow base's revenue-maximizing top tax rate, and (ii) exaggerate revenue gains and subsequent distortions as the top tax rate increases for the broad base. In comparison, the true tax base has a flatter Laffer curve.

## A.2 Current Top-Income Marginal Tax Rates

Revenue-maximizing top rates estimated using sufficient-statistic approaches account for all taxes—not just the top federal income tax rate. Therefore, one should compare those rates to the top marginal tax rate (MTR) of combined federal, state, and local taxes. As shown below, the current top MTR across all taxes and for all income is about 50%.[3] This estimate accounts for the different tax treatment across four income sources: employee wages, active passthrough business income, passive passthrough business income, and corporate income. These back-of-the-envelope estimates extend the approach in Kleven (2025) by accounting for excluded taxes (corporate, property, sales, etc.), as well as using tax microdata to estimate income-weighted state income taxes among those in the top federal tax bracket. The estimated all-in top MTR is consistent with empirical evidence using tax data—top 1% *average* tax rates of about 45% in 2022 (Auten and Splinter, 2024)—and those implied from the overlapping generations macroeconomic model.

*State Income Tax*: Using cleaned tax return data from the IRS Statistics of Income (INSOLE file), we estimate an average state income tax burden relative to AGI among returns in the top bracket in 2017. The resulting average top-bracket state-and-local income tax rate is 7.1%. Note that we cannot use more recent years because the state-and-local-tax (SALT) deduction cap caused truncated reporting among high-income returns (Auten and Splinter, 2024). This is a bit higher than the Kleven (2025) assumption of a top MTR for state income taxes of 6%, perhaps due to income-weighting that captures more income in California (top MTR of 12.3%) and New York City (top MTR of 14.8%), and is likely too low given new "millionaire" state tax brackets. For passthrough business income, however, because most states do not give the full federal deduction, we assume that the passthrough deduction has half the effect on top MTRs at the state level relative to the federal level, implying a top state income tax MTR of 6.7% for passthrough income.

*State Corporate Tax*: Corporate taxes in 2022 according BEA's National Income and Produce Accounts (NIPA) were $174 billion for state corporate taxes and $412 billion for federal corporate taxes. As corporate income tax rate schedules are relatively flat

revenue-maximize top tax rates on ordinary income are well above the present-law preferential income top tax rates of 23.8% in 2022.

[3] Note that the revenue-maximizing top federal income tax rates estimated in this paper are not comparable to this all-in total tax rate, which is applicable for the sufficient-statistic approach.

(i.e., nearly all income is subject to the top rate), scaling the federal MTR by total state revenues gives an implied state corporate MTR of $21\% \times \frac{\$174 \text{ billion}}{\$412 \text{ billion}} \approx 9\%$. [4] Adding this to the top federal corporate tax rate of 21% yields a total federal-state corporate tax rate of 30%. Also, based on estimates for those with top capital income, we assume 94% of corporate income is subject to lower preferential tax rates.

*Other top MTRs*: Wages are subject to an uncapped Medicare tax of 1.45% at the employer level, as well as 1.45% at the employee level (after deducting the employer portion of the tax). Wages above high thresholds (e.g., $200,000 for single workers and $250,000 for married workers) are subject to the 0.9% Additional Medicare Tax. Investment income (passive passthrough income, dividends, interest, capital gains, etc.) above modified adjusted gross incomes thresholds (also $200,000 for single workers and $250,000 for married workers) is subject to the 3.8% Net Investment Income Tax (Auten et al. (2016) discuss active vs. passive passthrough treatment). Passthrough income is reduced by the 20% passthrough deduction, but there are limitations to this deduction, especially for top incomes, and we follow the Kleven (2025) assumption—based on Kennedy et al. (2024)—that the top federal MTR of this income of 32.8%. Auten and Splinter (2024) estimated top one percent *average* tax rates of about 4% for property taxes and over 2% for sales and excise taxes. Unlike progressive income taxes, for which marginal tax rates exceed average rates, declining marginal propensities to hold real estate or consume would suggest the opposite for property and sales taxes. Thus for purposes of exposition, we assume a top MTR of property, sales, and excise taxes of 3%.

Applying these MTRs gives the following for four sources of income: employee wages, active passthrough income, passive passthrough income, and corporate income:

$$\tau_{wages} = 0.0145 + (1 - 0.0145) \cdot (0.37 + 0.0145 + 0.009 + 0.071) = 0.472$$
$$\tau_{ativepassth} = 0.328 + 0.067 = 0.395$$
$$\tau_{pasivepassth} = 0.328 + 0.038 + 0.067 = 0.433$$
$$\tau_{corp} = 0.30 + (1 - 0.30) \cdot (0.94 \cdot (0.20 + 0.038 + 0.071) + (1 - 0.94) \cdot (0.37 + 0.038 + 0.071)) = 0.523$$

Based on top 1% shares of income from each source (Auten and Splinter, 2024) and giving one-third weight the active portion of passthrough income—yielding a combined passthrough MTR of 42.0%—we estimate a top MTR for all taxes of about 50%:

$$\tau_{alltax} = 0.3 \cdot 47.2\% + 0.4 \cdot 42.0\% + 0.3 \cdot 52.3\% + 3\% = 49.7\%$$

[4] In 2022, state corporate tax rates (including surtaxes) were 8.84% in California and about 7.3% in New York, while reaching about 9% or higher in Alaska (9.4%), Delaware (8.7%), Illinois (9.5%), Iowa (9.8%), Maine (8.93%), Minnesota (9.8%), Pennsylvania (9.99%), and New Jersey (11.5%). This means the 9% "top" rate applied for the calculations above holds in various states, but the average top state corporate tax rate is a few percentage points lower and weighting by sales (due to factor apportionment) also implies a lower *average* state corporate tax rates. See https://taxadmin.org/2023-state-corporate-income-tax-rates and https://taxfoundation.org/data/all/state/state-corporate-income-tax-rates-brackets-2022.

In the macroeconomic model, the highest combined federal-state-local individual income and payroll MTR is 46.5%. It is unclear how much corporate taxes would increase this. Adding, as above, an assumed top-income property and sales tax MTR of 3% yields a top model MTR of about 49.5%, nearly identical to the estimate based on statutory rates. These combined top MTRs are not targets in the macroeconomic model but are for illustrative purposes for comparisons with the sufficient-statistic framework, which aggregates all taxes together (rather than any real tax rate).

## A.3 Taxable Income Elasticities

To gauge the sensitivity of microeconomic behavioral responses to tax rate changes implied by our model, we estimate the elasticity of taxable income (ETI) for the top permanent income group, $z = 7$, across single and married households as follows:

1. In the initial steady state with a top statutory tax rate of 37%, compute each household's taxable income $TI_1^i$, and their marginal tax rate on such income $MTR_1^i$.
2. Perturb the tax system and recompute each household's marginal tax rate $MTR_2^i$ under the perturbed system, while holding constant all initial steady state income and choice variables.
3. Allow households to re-optimize under the perturbed tax system and compute the resulting taxable income $TI_2^i$, holding constant all macroeconomic variables.
4. The arc elasticity of taxable income is computed as:

$$ETI^i = \frac{(TI_2^i - TI_1^i)/(0.5 * (TI_1^i + TI_2^i))}{((1 - MTR_2^i) - (1 - MTR_1^i))/(0.5 * ((1 - MTR_1^i) + (1 - MTR_2^i)))}$$

For our purposes, we perturb the tax system by increasing the entire statutory tax rate schedule by 10% (e.g., the top rate increases from 37% to 40.7%). Using our tax calculator specification, we estimate that for the working-age population, top-productivity single households have an income-weighted ETI of about 0.2, while top-productivity married households have an income-weighted ETI of about 0.5. The filing-type weighted ETI is about 0.4. These values are in the normal range of micro-based estimates (note that this method removes "macroeconomic" feedback). Since this group of households is approximately the top 1% of households in the model, our model-implied top-income ETIs are consistent with those implied by the model used in Guner et al. (2016).

As emphasized by Badel and Huggett (2017), the ETI for households below the top-rate threshold also matter for Laffer curves. Compared to the model-implied aggregate ETI of about 0.4 for top-productivity households, the aggregate ETI for lower productivity groups (i.e., $z = 1, ..., 6$) is about 0.1. The difference in scale across these two groups is consistent with the findings of Badel and Huggett (2017) and Badel et al. (2020). If we allow for the model economy to reach a new steady state in step 3 above, so to account for macroeconomic feedback effects (inclusive of the full firm response channel), our model-implied ETI estimate increases from 0.4 to 0.5 for the top productivity group.

Note that the implied ETI's discussed here are fundamentally different from empirical estimates from data that are context dependent (usually around policy changes to tax rates). Those estimates are for short-term or medium-term changes, whereas those estimate from the general equilibrium model are for steady states and therefore should be considered long-term ETIs. Also, the model only captures behavior from optimal changes (and from that we back out implied ETIs). Responses with increased tax avoidance through reclassifying income (i.e., "paper avoidance" as in Heiser et al. (2025)) or tax evasion are not directly captured in the model. Still, the model is calibrated to empirical tax data and therefore includes baseline income misreporting (Online Appendix C.2.2), but this scales with income changes.

# B Additional Model Detail

## B.1 Households

### B.1.1 Preferences

In this section, we describe the functional forms of household preferences consistent with the household optimization problem described in Section 2.1. Following Moore and Pecoraro (2023), the following functional form for instantaneous utility $U^{f,z}_{t,j}$ is chosen to be consistent with a balanced growth path in the presence of the fixed utility cost:

$$U^{s,z}_{t,j}(x_j, n_j) \equiv \log(x_j) - \nu^s_j(n_j) - F^{s,z}_j(n_j) \tag{B.1}$$

$$U^{m,z}_{t,j}(x_j, n^1_j, n^2_j) \equiv \log(x_j) - \nu^m_j(n^1_j, n^2_j) - F^{m,z}_j(n^2_j), \tag{B.2}$$

where $\nu^f_j(\bullet)$ is a continuous age-varying labor supply disutility function and $F^{f,z}_j(\bullet)$ is a discrete function taking on a positive value only when the single or married-secondary worker is employed. The labor supply disutility function takes the form:

$$\nu_j(n_j) = \begin{cases} \psi^s \frac{(n_j+\varphi^{s,z}_j)^{1+\zeta^s}}{1+\zeta^s} & f = s \\ \psi^{m,1} \frac{(n^1_j)^{1+\zeta^{m,1}}}{1+\zeta^{m,1}} + \psi^{m,2} \frac{(n^2_j+\varphi^{m,z}_j)^{1+\zeta^{m,2}}}{1+\zeta^{m,2}} & f = m, \end{cases} \tag{B.3}$$

where $\varphi^{f,z}_j$ is an exogenous, age-varying time-use term for child-rearing that is independent of work hours, in the spirit of Guner et al. (2012) and Guner et al. (2020), which has the effect of increasing the disutility of labor over ages for which the number of children is relatively high. The fixed utility cost takes the form:

$$F_j^{f,z}(n_j) = \begin{cases} (1 + dep_j^{f,z})\phi^s \boldsymbol{I}(n_j > 0) & f = s \\ (1 + dep_j^{f,z})\phi^m \boldsymbol{I}(n_j^2 > 0) & f = m, \end{cases} \tag{B.4}$$

where $\boldsymbol{I}(\bullet)$ is an indicator function that equals one only if labor supply of a single worker or married secondary worker is positive. Given these two functions, the parameter sets $\{\zeta^s, \zeta^{m,1}, \zeta^{m,2}\}$, $\{\psi^s, \psi^{m,1}, \psi^{m,2}\}$, and $\{\phi^s, \phi^m\}$ fully specify labor supply preferences.

We treat the demand for owner-occupied housing as a durable-goods problem where households can costlessly transform the single output good produced by firms into a consumption good, a financial asset, or an owner-occupied housing asset. The consumption composite good $x_j$ nests beginning-of-period stock of owner-occupied housing services, among additional consumption variables, in a CES fashion as specified in Appendix A of Moore and Pecoraro (2023). The composite consumption good $x_j$ nests endogenous quantities for consumption of market goods, housing services from an owner-occupied housing or rental unit, child-care, services produced at home, and charitable giving.

The wealth in the utility function (Equations 2.2 and 2.2) takes a log functional form so that it is consistent with a balanced growth path, and is assumed to be non-homothetic in total wealth as in De Nardi (2004) and Francis (2009):

$$O_t(a_{j+1}, h_{j+1}^o) \equiv \log\left((a_{j+1}, h_{j+1}^o)/o_{t+1}^z + 1\right), \tag{B.5}$$

where the parameter $o_t^z$ determines the extent to which wealth is a luxury good, and depends on time only through exogenous growth at the gross rate of technical progress, $\Upsilon_A$. Because households receive utility from owner-occupied housing assets indirectly through the consumption composite $x_j$ and directly through the function $O_t(a_{j+1}, h_{j+1}^o)$, a unit of housing assets yield more utility than a unit of financial assets. Housing is thus simultaneously a savings vehicle and a consumption good.

### B.1.2 Housing

Upon entering the economy, a household receives an exogenous endowment of financial wealth, but no owner-occupied housing:

$$a_1 = \bar{a}, \quad h_1 = 0. \tag{B.6}$$

We assume that there is an institutional minimum size of owner-occupied housing equal to $\underline{\mathrm{h}}^o$; a household that is unable to afford at least $\underline{\mathrm{h}}^o$ will instead rent housing. To purchase a residence, a household must also have a minimum down payment ratio of $1 > \gamma > 0$. Homeowners may use their property as collateral for borrowing as long as this minimum equity ratio is satisfied. Renters are permitted to borrow and have negative total wealth down to an exogenous $\underline{\mathrm{y}}^{f,z} < 0$:

$$a_j \geq \begin{cases} \underline{y}^{f,z} & \text{if } h_j^o = 0 \\ \max\{\underline{y}^{f,z}, (\gamma - 1)h_j^o\} & \text{if } h_j^o > 0. \end{cases} \tag{B.7}$$

When a household chooses to change their residential status from a renter to homeowner, or vice versa, they face a housing transaction cost $\xi_j^H > 0$:

$$\xi_j^H = \begin{cases} \phi^o h_{j+1}^o & \text{if } h_j^o = 0 \\ \phi^r h_{j+1}^r & \text{if } h_j^o > 0. \end{cases} \tag{B.8}$$

## B.2 Firms

The numéraire output good is produced by representative firms in two perfectly competitive sectors (corporate and noncorporate: $q = c, n$) using identical constant returns to scale, Cobb-Douglas technology:

$$Y_t^q = (G_t)^g (K_t^q)^\alpha (A_t N_t^q)^{1-\alpha-g} \quad \text{for} \quad q = c, n, \tag{B.9}$$

where $G_t$ is beginning-of-period public capital from the government, $K_t^q$ is beginning-of-period productive private capital stock, $N_t^q$ is effective labor, and $A_t$ is labor-augmenting technology that evolves identically within each sector according to $A_{t+1} = \Upsilon_A A_t$. Assuming decreasing returns to scale for private factors allows for an interior solution with this two-sector, single-good framework. Each firm's law of motion for capital is:

$$K_{t+1}^q = (1 - \delta^K) K_t^q + I_t^q \quad \text{for } q = c, n, \tag{B.10}$$

where $\delta^K$ is the economic rate of depreciation on private capital.

Differences between corporate and noncorporate entities imply distinct incentive effects when the individual-level top income tax rate changes. These differences can generate reallocation between sectors, or sectoral shift. Corporate and noncorporate firms primarily differ in their tax treatment, the profit distribution rules, and ability to issue new equity:

1. **Tax Treatment:** Corporate firms remit taxes at an entity-level in the form of corporate income taxes. Noncorporate firms, by contrast, do not pay an entity-level tax, as profits are passed directly to owners and taxed at the individual level. Noncorporate firms are therefore referred to as *passthrough* businesses.

2. **Distribution of Profits:** Corporate firms distribute a chosen share of after-tax profits as dividends, while noncorporate firms distribute all profits to their owners. At the individual level, qualified corporate dividends (and long-term capital gains) may qualify for low, preferential tax rates, whereas noncorporate distributions are treated as ordinary income and subject to full statutory tax rates.

3. **New Equity Issuance:** Only corporate firms are assumed to be able to issue new shares of equity to finance operations.

In a financial market equilibrium, the real after-tax return on the equity value of each sector's representative firm, $R_t^q V_t^q$, equals the sum of the after-tax change in firm value and net distributions:

$$V_t^c R_t^c = (1-\tau_t^g)\underbrace{(V_{t+1}^c - V_t^c - shr_t)}_{gns_t^c} + (1-\tau_t^d)div_t \tag{B.11}$$

$$V_t^n R_t^n = (1-\tau_t^g)\underbrace{(V_{t+1}^n - V_t^n)}_{gns_t^n} + dst_t - txl^n, \tag{B.12}$$

where $\tau_t^g$ is the aggregate accrual-equivalent tax rate on capital gains $gns_t^q$; $\tau_t^d$ is an aggregate effective marginal tax rate on corporate dividends $div_t$; and $txl^n$ is the taxes on noncorporate distributions $dst_t$. Pre-tax capital gains differ across sectors due to the assumption that the corporate firm is publicly traded, so that it can issue or buy back shares of equity $shr_t$.

The objective function for the representative firm in each sector can be obtained by rearranging (B.11) and (B.12) for $V_t^q$, and solving forward:

$$V_t^c(K_t^c) = \max_{N_t^c, K_{t+1}^c} \frac{(1-\tau_t^d)div_t - (1-\tau_t^g)shr_t}{(R_t^c + 1 - \tau_t^g)} + \beta_t^c V_{t+1}^c(K_{t+1}^c) \tag{B.13}$$

$$V_t^n(K_t^n) = \max_{N_t^n, K_{t+1}^n} \left(\frac{dst_t - txl^n}{R_t^n + 1 - \tau_t^g}\right) + \beta_t^n V_{t+1}^n(K_{t+1}^n), \tag{B.14}$$

where $\beta_t^q \equiv \frac{(1-\tau_t^g)}{(R_t^q + 1 - \tau_t^g)}$ for $q = c, n$. Each firm faces a sector-specific cash-flow constraint that differs according to its ability to issue new equity, buyback share, and the presence of an entity-level tax:

$$ern_t^c + B_{t+1}^c - B_t^c + shr_t = div_t + I_t^c + txl_t^c \tag{B.15}$$

$$ern_t^n + B_{t+1}^n - B_t^n = dst_t + I_t^n. \tag{B.16}$$

The left-hand side variables of the cash-flow restrictions represent current-period resources available to the firm while the right-hand side variables represent outlays. Earnings for firms in both sectors are defined as production of output $Y_t^q$, less wages paid to labor input $w_t N_t^q$, and interest paid on debt $i_t B_t^q$:

$$ern_t^q \equiv Y_t^q - w_t N_t^q - i_t B_t^q \quad \text{for} \quad q = c, n. \tag{B.17}$$

The noncorporate firm does not issue new equity to finance operations, and therefore noncorporate distributions can be determined as a residual of their cash-flow restriction. Since the corporate firm may issue new equity, corporate dividend policy must be specified so that external financing choices can be fully determined. As in Zodrow and Diamond (2013), we assume that the corporate dividends are an exogenous fraction $\varkappa^d$ of after-tax earnings:

$$div_t = \varkappa^d (ern_t^c - txl_t^c). \tag{B.18}$$

As a departure from Moore and Pecoraro (2023), we make leverage choice endogenous as in Barro and Furman (2018) by allowing firms to choose the debt-capital ratio that maximizes the value of the interest-deduction tax shield subject to convex leverage costs, $\frac{1}{\phi_1^q}\left(\frac{B_t^q}{K_t^q}\frac{1}{\phi_2^q}\right)^{\phi_1^q} K_t^q \phi_2^q$. This conveniently allows us to express the beginning-of-period stock of debt, $B_t^q$, as an optimal ratio of capital $\boldsymbol{\varkappa}_t^{b,q}$:

$$B_t^q = \boldsymbol{\varkappa}_t^{b,q} K_t^q \quad \text{for } q = c, n, \tag{B.19}$$

where $\boldsymbol{\varkappa}_t^{b,q}$ depends on the marginal value of the interest deduction.[5]

Taxes for the representative corporate and noncorporate firm, $txl_t^q$, take the form:

$$txl_t^q = \tau_t^q \left(Y_t^q - ded_t^q\right) - crd_t^q + slt_t^c \left(\boldsymbol{I}_{q=c}\right) \quad \text{for } q = c, n,$$

where $\tau_t^q$ is an aggregate effective federal marginal tax rate on net business income, $ded_t^q$ are federal deductions from gross income, $crd_t^q$ is a credit against gross federal taxes, and $slt_t^c \left(\boldsymbol{I}_{q=c}\right)$ are state-local taxes that are positive only for the corporate firm. Allowable federal deductions for firms include wage expense, a portion of interest expense, tax depreciation of capital, and state-local taxes (for corporate sector only):

$$ded_t^q = w_t N_t^q - \kappa^{int} i_t B_t^q - \left(\varrho^q I_t^q + \hat{\delta}^q da_t^q\right) - slt_t^c \left(\boldsymbol{I}_{q=c}\right) \quad \text{for } q = c, n,$$

where $\varrho^q$ is the capital investment expense ratio, $\hat{\delta}^q$ is tax depreciation rate of capital, $da_t^q \equiv (1 - \hat{\delta}^q) da_{t-1}^q + (1 - \varrho^q) I_t^q$ is current depreciation allowances.

## B.3 Government

Federal and state-local governments collect taxes from households and corporations $TX_t$, issue public debt $B_t^G$, to finance non-valued public consumption $C_t^G$, productive capital

[5] Letting $\kappa i_t B_t$ be the amount of interest expenses deductible at rate $\tau_t$, and leverage costs be $\frac{1}{\phi_1}\left(\frac{B_t}{K_t}\frac{1}{\phi_2}\right)^{\phi_1} K_t \phi_2$, the optimal debt-capital ratio is $\varkappa_t = \phi_2 \left(\kappa i_t \tau_t\right)^{1/(\phi_1 - 1)}$.

expenditures $I_t^G$, and transfer payments to households $TR_t$.[6] The recursive budget constraint of the consolidated federal and state-local government can be expressed as:

$$I_t^G + C_t^G + TR_t \leq TX_t + B_{t+1}^G - (1+\rho_t)B_t^G. \quad \text{(B.20)}$$

To account for the time-to-build properties of public capital (Ramey, 2020; Leeper et al., 2010), the law of motion for public capital is:

$$G_{t+1} = (1-\delta^g)G_t + \sum_{s=1}^{S} \kappa_s^{TTB} I_{t-s+1}^G, \quad \text{(B.21)}$$

where $\delta^g$ is the rate of economic depreciation on public capital, $S$ is the number periods it takes for public capital investment to become fully productive, and $\sum_{s=1}^{S} \kappa_{s-1}^{TTB} = 1$.

Total taxes collected by the consolidated government include taxes from households and corporations:

$$TX_t = txl_t^c + \int_{\mathbb{Z}} \int_{\mathbb{J}} \sum_{f=s,m} T_{t,j}^{f,z} \; \Omega_{t,j}^{f,z} \; dj \; dz. \quad \text{(B.22)}$$

In addition to Social Security payments $ss_{t,j}^{f,z}$, households receive lump-sum transfer payments from the government $trs_t$. Aggregate government transfers are therefore:

$$TR_t = \int_{\mathbb{Z}} \int_{\mathbb{J}} \sum_{f=s,m} \left( ss_{t,j}^{f,z} + trs_t \right) \Omega_{t,j}^{f,z} \; dj \; dz. \quad \text{(B.23)}$$

## B.4 Financial Intermediary

All household financial assets are pooled into a fund managed by perfectly competitive financial intermediaries. Assets include corporate and noncorporate equity and bonds, federal government bonds, and rental housing, the latter of which is directly accumulated by the financial intermediaries for simplicity. For a given portfolio allocation, gross (pre-individual-tax) returns are defined as:

$$Inc_t \equiv div_t + dst_t + \Sigma_{q=c,n}(gns_t^q + i_t B_t^q) + (p_t^r - \delta^r)H_t^r + \rho_t B_t^G, \quad \forall t \quad \text{(B.24)}$$

where $(p_t^r - \delta^r)$ is the net-of-depreciation return on aggregate rental housing, $H_t^r$, and the "safe-asset" return on government bonds is:

$$\rho_t \equiv \varpi i_t + \varsigma \exp\left( \frac{B_t^G}{\sum_q Y_t^q} \right).$$

[6] The presence of debt implies interest payments change across steady states, even if the stock of debt is held constant. Federal and state-local governments are consolidated for exposition. State-local government policy variables are held fixed, but we include state-local taxes to capture their distortionary impact on behavior and state-local public capital to capture their positive productivity impacts on private factors.

where $\varpi < 1$ determines how $\rho_t$ covaries with $i_t$ and $\varsigma$ determines the response of the $\rho_t$ to changes in the debt-GDP ratio. All pretax returns are distributed back to households in proportion to aggregate investment shares, with weighted returns determining the real rate of return on financial assets, $r_t$.

So that the portfolio allocation is optimal in the aggregate, the representative financial intermediary is assumed to internalize the average tax consequences of households, and invest across private assets to equalize marginal after-tax rates of returns as specified in equation (2.15), repeated here for convenience:

$$R_t^q = (1 - \tau_t^i) i_t^q = (p_t^r - \delta^r) \quad \forall t, q = c, n.$$

This allocation behavior ultimately determines how the households' composition of ordinary versus preferential capital income varies with business activity in equilibrium.

## B.5 Equilibrium

The model is specified so that, when expressed in trend-stationary form, aggregates are constant and the economy exhibits a steady state balanced growth path. Equilibrium is formally defined in Appendix C of Moore and Pecoraro (2023), subject to modifications described in this paper. The equilibrium is a collection of decision rules that are the solutions to households' and firms' optimization problems; a collection of economic aggregates that are consistent with household and firm behavior; a collection of prices that facilitate cross-sector factor-price equalization and clearing in factor, asset, and goods markets; and an associated set of policy aggregates that are consistent with government budget constraints.

# C Calibration

The initial steady state is calibrated to approximate the 2022 economic environment and tax law with a 37% top tax rate, which is the baseline for our policy experiments in this paper. Calibration procedures generally follow those described in Section 3 and Appendix B of Moore and Pecoraro (2023), adjusted from the 2017 baseline used in that paper to the 2022 baseline used in this paper. In this appendix, we focus on key differences in the model used in this paper. The reader should refer to Moore and Pecoraro (2023) for further details about the model parameters.

Select non-tax parameter values and associated steady-state targets, as calibrated for our preferred *true base* specification using the tax calculator, are summarized in Table E1. Aggregate economic targets are summarized in Tables E2 and E3. Income and tax targets are summarized in Tables E4–E6. Model moments reported in these tables reflect the initial steady state of the true base specification. To make initial steady states for the *broad base* and *narrow base* tax function specifications consistent with our preferred specification (which allows for direct comparison of the respective Laffer curves), we calibrate them with the same economic and tax targets, as discussed in section D.

## C.1 Hourly Wage Process

### C.1.1 Data

The hourly wage income process is based on empirical estimates from Dowd et al. (2026), which makes use of a large panel of administrative tax data consisting of individual-level observations of employee wage income. The data starts with a 5% sample of Taxpayer Identification Numbers (TINs) of filers and non-filers for tax years 2015 to 2022. The sampling is based on the last four digits of randomly constructed masked TINs among primary and secondary filers (i.e., spouses on the same tax return) and any non-filer with an information return.

These individual-level observations are linked to individual-level information returns: Forms W-2 for Medicare wages (the broadest measure of wage income) and Forms 1095-C, which include months of full-time or part-time employment and are available if an individual's employer has more than 50 full-time employees.[7] Individuals are retained in each year if they have at least nine months of full-time employment. Each month of full-time employment is assumed to have 42 hours of work, and each month of part-time employment 17 hours of work. Annual amounts sum across an individual's Forms W-2 for wage amounts and across Forms 1095-C for the monthly hours, which accounts for workers with multiple employers. Annual Medicare wage amounts are divided by total annual hours to estimate hourly wages and then indexed to real 2022 values using the CPI-U index.

### C.1.2 Estimating Lifecycle Profiles

In Dowd et al. (2026), fixed effects are removed from each observation and subsequently added back the overall mean to obtain residualized log real hourly wages. Values are winsorized at five ten-thousandths of a percent. They estimate the mean and standard deviation of hourly wages across single-year age groups, i.e., age cohorts $j$. For each year an individual is observed, values are demeaned by the age group mean and divided by the standard deviation yielding a z-score. They interpret this z-score as the number of standard deviations relative to the mean real hourly wage income for their age group. Individuals observed fewer than five times or born after 2000 are dropped.

[7] These information returns are sent to IRS each year from all employers for each employee, Form W-2 is for wages and tax withholding and Form 1095-C documents employer-provided health insurance and monthly employment status.

For each birth-year cohort, individuals are sorted by average z-scores and binned into quantiles. For purposes of this paper, we choose seven quantiles to represent each of the $z$ permanent income type: top 1%, remainder of top 5%, remainder of top 10%, remainder of top quartile, 3rd quartile, 2nd quartile, and first quartile. Deviations from means for each age-productivity combo $(j, z)$ are used to calculate percentage errors. Let the mean real hourly wage (not in logs) for each age and permanent income type be $\bar{w}_{j,z}$, and the error for observation $i$ within each $(j, z)$ combo be $\varepsilon_{i,j,z}$. The real hourly wage process is: $w_{i,j,z} = \bar{w}_{j,z}(1 + \varepsilon_{i,j,z})$.

### C.1.3 Discretization

For purposes of this paper, we construct a grid of five age and productivity-type varying nodes on which to approximate the continuous i.i.d. process described above. The first and last node are the $(j, z)$ specific $5^{th}$ and $95^{th}$ percentile observation $\varepsilon_{i,j,z}$, while the middle node is the median. For the second and fourth nodes, we use a modified Tauchen (1986) procedure, where the "Tauchen multiple" is chosen to minimize the mean absolute error of the simulated discrete process from the estimated continuous process, on average over the lifecycle for each permanent income group. This procedure allows for households in the top productivity groups within the overlapping generations model to transition into and out of the income range associated with top tax bracket.

## C.2 Income and Tax Targets

### C.2.1 Individual Labor Income

As in Moore and Pecoraro (2023), we define household economic labor income to be a NIPA-comparable wage income concept plus positive self-employment income.[8] Letting each productivity type $z = \{1, ..., 7\}$ correspond to the notion of a permanent labor income class for each family composition type $f = \{s, m\}$, we use the Joint Committee on Taxation's Individual Tax Model (JCT-ITM)[9] to distribute the cross-sectional labor income of non-dependent tax filers with age of primary between 25 and 64.[10] Each for non-joint and joint tax filers, the 7 productivity types represent the following percentile classes: $\{0 - 20; 20 - 40; 40 - 60; 60 - 80; 80 - 90; 90 - 99; 99 - 100\}$.

[8] The NIPA-comparable measure used here is the sum of $(i)$ AGI wage income $(ii)$ combat pay, $(iii)$ employers' share of the FICA tax, $(iv)$ deferred 401k compensation, $(v)$ employers share of 401k compensation, $(vi)$ employer provided dependent care, $(vii)$ employer health-insurance compensation, $(viii)$ employer HSA compensation, and $(ix)$ employer life-insurance compensation.

[9] Joint Committee on Taxation's Individual Tax Model is in principle similar to NBER's TAXSIM model. However, while TAXSIM makes use of the IRS Statistics of Income (SOI) public use tax return files, the JCT-ITM generally uses a more recent, confidential sample of tax returns from the SOI division that contains a broader set of variables than do the public use data. For more information, see Joint Committee on Taxation (2023).

[10] The BEA does not report distributional characteristics of NIPA wage income the same income classes levels used in our model.

Labor productivity for each $(z,f,j)$ demographic, $\mathrm{z}_j^{z,f}$, is the product of a demographic-independent age-varying component, $\mathrm{z}_j^z$, and a demographic-dependent age-invariant component, $\mathrm{z}^{z,f}$. The age-varying component is exogenously set to the mean real hourly wage profile describe in Appendix C.1.2 for each permanent income type. The age-invariant component is calibrated internally for each $(z,f)$ demographic so that average annual labor income over working ages $j=\{1,..,R-1\}$ in the initial steady state matches an average annual labor income target computed for their respective percentile class from the JCT-ITM. While both individuals in married households face the same productivity term $\mathrm{z}_j^{z,m}$, there is an exogenous productivity wedge $\mu^z$ between primary and secondary workers.

### C.2.2 Individual-Level Taxation

**Ordinary and Preferential Income:** We distinguish between a household's economic income, which is relevant for macroeconomic targets, and adjusted gross income (AGI), which is relevant for tax targets. Whether using the tax calculator or tax functions, this is consistently done through the use of time- and policy-invariant "calibration ratios" to scale each particular flow of economic income to its appropriate tax base.

For labor income, we specify a calibration ratio $\chi_j^{\boldsymbol{i};f,z}$ that depends on a household's family composition, productivity type, and age group (working or retired). A household's "adjusted gross labor income," $\hat{i}_{t,j}^{f,z}$ is then obtained as:

$$\hat{i}_{t,j}^{f,z} \equiv \chi_j^{\boldsymbol{i};f,z} i_{t,j}^{f,z},$$

where a variable with a hat has been adjusted by a calibration ratio. The labor income calibration ratio is exogenously computed as the portion of total economic labor income included in AGI for each $(f,z,j)$ demographic group using the JCT-ITM. Labor income in AGI corresponds to wages reported on inidividual tax returns (Form 1040) and positive net self-employment income for working-age households, and the taxable portion of social security income for retirees. Table E4 shows the fit of the adjusted gross labor income and associated taxes within the model for working-age households as produced by the tax calculator.

Capital income in AGI corresponds to total AGI reported on individual tax returns less the portion allocated to labor income, and is therefore primarily comprised noncorporate business income (excluding from self-employment), interest income, dividend income, and capital gain income.[11] To determine the portion of gross economic capital income included in AGI within the model, we specify two sets of calibration ratios. The first, $\chi_j^{\boldsymbol{a};f}$, is used to target the empirical distribution of capital income included in AGI, and is assumed to

[11]Note that realized gains from the sale of owner-occupied housing is a negligible portion of adjusted gross capital income because of the large tax-exclusion on such capital gains.

depend on family composition and age group (working or retired). It is also assumed to be independent of productivity type because of imperfect correlation between household labor and capital income, and instead is structured to be a nondecreasing function of a household's relative location in the conditional financial asset distribution $\boldsymbol{f}(a|f,j)$:

$$\chi_j^{\boldsymbol{a};f} = \boldsymbol{\chi}^{\boldsymbol{a}}(\boldsymbol{f}(a|f,j)).$$

The second set of calibration ratios, $\chi_k^{\boldsymbol{o}}$ and $\chi_k^{\boldsymbol{p}}$, are uniform across taxpayers and used to target the observed aggregate ordinary ($\boldsymbol{o}$) and preferential ($\boldsymbol{p}$) capital income taxes across the four capital income types. Letting $\lambda_{t,k}$ denote the endogenous share of capital income of type $k$,[12] and $s_k^{\boldsymbol{o}} = \boldsymbol{s}_k^{\boldsymbol{o}}(\boldsymbol{\chi}^{\boldsymbol{a}})$ denote the ordinary share of income type $k$, then a household's ordinary and preferential capital income included in AGI are:

$$r_t\hat{a}_j^{\boldsymbol{o}} \equiv r_t\left(\sum_k \chi_k^{\boldsymbol{o}} s_k^{\boldsymbol{o}} \lambda_{t,k}\right)\chi_j^{\boldsymbol{a};f} a_j$$
$$r_t\hat{a}_j^{p} \equiv r_t\left(\sum_k \chi_k^{p}(1-s_k^{\boldsymbol{o}})\lambda_{t,k}\right)\chi_j^{\boldsymbol{a};f} a_j.$$

"Adjusted gross capital income" is therefore the sum of a household's ordinary and preferential portions so that $r_t\hat{a}_j \equiv r_t\hat{a}_j^{o} + r_t\hat{a}_j^{p}$.[13]

The calibration ratio $\chi_j^{\boldsymbol{a};f}$ is assumed to be a second-order polynomial over the positive domain of financial assets and clipped at its maximizer to be weakly monotonic. It is internally calibrated in the initial steady state so that characteristics of the distribution of adjusted gross capital income within the model for each $(f,j)$ demographic fits the analogs estimated using the JCT-ITM. When ordering working-age households by capital income included in AGI, there is very little adjusted gross capital income realized by households below the 80th percentile because most of these households hold their economic capital income within tax-deferred retirement accounts. Of the total capital income included in AGI for working-age households, the top decile holds in excess of 90%. Adjusted gross capital income is somewhat less concentrated among retired households as tax-deferred savings are drawn down, although more than 50% of total capital income included in AGI for retired households is realized by the top decile.

For each type of capital income $k$, the function $s_k^{\boldsymbol{o}}$ is a time-invariant mapping from adjusted gross capital income to ordinary income shares. While all of noncorporate business income and interest income are considered ordinary income under present tax law (corresponding trivially with $s^{\boldsymbol{o}} = 1$), only about 24.5% of all corporate dividends and

[12] The variable $\lambda_{t,k}$ is endogenous and time-variant because it represents the portfolio allocation chosen by the financial intermediary in each period.

[13] In terms of the simplified decomposition described Appendix A.1, $\boldsymbol{\chi}$ corresponds to the normalized term $\left(\sum_k \lambda_{t,k}\chi_k^{\boldsymbol{o}} s_k^{\boldsymbol{o}}\right) / \left(\sum_k \lambda_{t,k}\left(s_k^{\boldsymbol{o}}\chi_k^{\boldsymbol{o}} + \chi_k^{\boldsymbol{p}}(1-s_k^{\boldsymbol{o}})\right)\right)$.

6.0% of all capital gains included in AGI are considered ordinary income (corresponding with $0 < s^{\boldsymbol{o}} < 1$). The ordinary share function for dividend and capital gain income is therefore calibrated to be decreasing in adjusted gross capital income within the model for each $(f, j)$ demographic fits the analogs estimated using the JCT-ITM.

The uniform calibration ratios $\chi_k^{\boldsymbol{o}}$ and $\chi_k^{\boldsymbol{p}}$ are internally calibrated in the initial steady state to match the aggregate tax revenue to output ratio for each ordinary and preferential capital income type $k$ as computed using the JCT-ITM. Table E5 shows the model fit for ordinary and preferential capital income taxes as produced by the tax calculator.

Since a calibration ratio represents the portion of a given income source that is included in AGI, misreporting of income due to tax avoidance and evasion is implicitly captured in our baseline. We hold these calibration ratios constant when computing each Laffer curve so that the rate of implicit misreporting on each income source is held constant across different top rates. This implies that there is a constant wedge between the effective marginal tax rate on an additional dollar of *income included in AGI* and an additional dollar of *true economic income* along a Laffer curve.[14] As an example, for the top 1% of households by income in the initial steady state baseline, a one dollar increase in noncorporate income in AGI is associated with an increase in federal income taxes of about 0.40 dollars while a one dollar increase in true economic noncorporate income is associated with an increase in federal income taxes of about 0.30 dollars. The difference suggests an implicit 25% misreporting rate for this group for noncorporate income, which remains constant as the top rates increase across the steady states that trace out the Laffer curve.[15]

**Other Individual-Level Taxes:** Federal individual taxes incorporated in the model also include payroll taxes and estate taxes.[16] State-local individual taxes incorporated in the model include income taxes, sales taxes, and property taxes. With the exception of the estate taxes, each of these taxes are modeled as separate proportional tax instruments. The calibration procedure for each of these follows from Moore and Pecoraro (2023). Table E6 shows that the aggregate tax revenue as a share of output for each of these taxes fits the data well.

[14] For capital income type $k$, true economic income is $r_t a_j \lambda_{t,k}$ while the amount included in AGI is $r_t a_j \lambda_{t,k}\{(\chi_k^{\boldsymbol{o}} s_k^{\boldsymbol{o}} + (1 - s_k^{\boldsymbol{p}})\chi_k^{\boldsymbol{p}})\, \chi_j^{\boldsymbol{a};f}\}$.

[15] This implied top 1% marginal noncorporate (passthrough) business income misreporting rate is similar to empirical evidence. Gorman et al. (2025) use IRS random audit data and targets (which are used for the misreporting amounts in national accounts) and estimate a similar top 1% average misreporting rates for S-corporation and partnerships of 18% for 2014-2015 and 24% for 2010-2013.

[16] Payroll taxes include Federal Insurance Contributions Act (FICA) and Self Employment Contributions Act (SECA) contributions for the Old Age, Survivors, and Disability Insurance (OASDI) program, and their contributions for the Medicare program.

### C.2.3 Individual-Level Taxes and Aggregation

The firm's optimization problems (B.13) and (B.14), as well as the representative financial intermediary's no-arbitrage condition (2.15), incorporate aggregate tax rates on individual-level income that are model-consistent when using "full" firm responses. To obtain the aggregate effective marginal tax rates (EMTRs) for interest income $\tau_t^i$, noncorporate business income $\tau_t^{n,hh}$, and corporate dividend income $\tau_t^{d,hh}$, we first compute each at the household level. This is achieved by computing the change every household's income taxes that occurs following to a 1% increase in interest income, noncorporate business income, and corporate dividend income respectively. Next, these individual-level EMTRs are aggregated using population and income weights. To obtain the aggregate accrual-equivalent tax rate on capital gains, aggregate taxes attributed to capital gains are divided by aggregate capital gains income. While "full" firm responses means that these tax rates are recomputed at every point on the Laffer curve, "partial" firm responses assume that these tax rates do not change in response to an increase in the top individual income tax rate.

While firms and the financial intermediary are not directly liable for individual-level taxes, changes to individual-level taxes feedback into the aggregate tax rates and affect their decisions. Consider an increase in the top statutory income tax rate on ordinary income: The aggregate tax rates appearing in the no-arbitrage condition (2.15) will necessarily increase but at different magnitudes. Since all noncorporate business income is considered ordinary capital income while most corporate dividend income is considered preferential capital income, the after-tax return to noncorporate equity will decrease by more than the after-tax return to corporate equity. In addition, since the noncorporate firm internalizes the increased aggregate tax rate on noncorporate business income while the corporate firm internalizes its entity-level income tax rate that remains constant, production incentives shift from the noncorporate sector towards the corporate sector. By increasing the marginal investor's required rate of return in the noncorporate sector relative to the corporate sector, this wedge causes a reallocation of capital from the noncorporate to corporate sector that drives up the pre-tax rate of return in the former and drives down the pre-tax rate of return in the latter. This results in a shift in the composition of capital income away from ordinary income subject to the top rate and towards preferential capital income.

# D Simplified Tax Functions

## D.1 Parameterization

Simplified tax functions are common in macroeconomic research.[17] One of the most widely-used tax functions is that popularized by Heathcote et al. (2017).[18] This specification uses two exogenous parameters—a level parameter $\lambda_1$ and a curvature parameter $\lambda_2$—to characterize the tax or tax-and-transfer system. For tax unit $i$, pre-tax income $y^i$ defines the tax base and determines the associated taxes $T^i$:

$$T^i(y^i) = y^i - \lambda_1(y^i)^{(1-\lambda_2)}$$

As described in Moore and Pecoraro (2020), the exogenous values of $\lambda_1$ and $\lambda_2$ together with the distribution of pre-tax incomes (i.e., the tax base) jointly determine the aggregate income-weighted effective marginal and average tax rates implied by the tax function. As these tax rates are targeted moments of a given macroeconomic model, the values chosen for the tax-function parameters should vary by the tax base specified within a given model. Therefore, we re-estimate the two exogenous parameters for tax functions depending on the relevant tax base.

Under the *broad-base* specification of the tax function, where the relevant tax base is all labor and capital income, we target the aggregate income-weighted effective marginal and average tax rates with respect to adjusted gross income (AGI). Under the narrow-base specification of the tax function, where the relevant tax base is instead only labor income, we instead target aggregate tax rates with respect to wages plus (positive) self-employment income in AGI. Because capital does not enter the narrow-base tax function, a uniform proportional tax rate is applied to the residual income (AGI - y) to capture taxes on capital income. In both cases, the adjustments to household economic income described in Appendix C.2.2 are made to arrive at adjusted gross labor and capital income. Finally, we specify that income from the relevant tax base in excess of a top threshold that is subject to the top rate. In 2022, the statutory top federal tax rate on ordinary income of 37% applied to taxable income in excess of $539,900 for non-joint-filing tax units and $647,850 for married individuals filing jointly.

The aggregate tax rates used to parameterize the tax functions in both the broad- and narrow-base scenarios are computed separately for joint-filing and non-joint filing tax units using JCT's Individual Tax Model for calendar year 2022. Distinguishing between single and married households respectively, $f = s, m$, the values of the parameters are set

[17] Moore and Pecoraro (2020, 2021) advocate for explicit modeling of income tax provisions, showing that simplified tax functions predict incorrect behavioral responses when considering an expansion of the earned income tax credit and certain provisions from the 2017 tax reform. Guner et al. (2023) expand upon the simplified tax functions by explicitly modeling refundable tax credits.

[18] This function was also used by Bénabou (2002), Feldstein (1969) and Musgrave and Thin (1948).

to $\lambda_1^f = \{3.6577, 3.8814\}$ and $\lambda_2^f = \{0.1214, 0.1200\}$ for the broad base specification, and $\lambda_1^f = \{3.7186, 4.1907\}$ and $\lambda_2^f = \{0.1253, 0.1286\}$ for the narrow base specification.

## D.2 Comparison With Tax Calculator

While the tax functions' broad and narrow bases can reproduce some simplified distributional pattern of taxes observed in the data, this hides substantial dispersion in taxes at similar levels of income, causing the tax functions to mis-specify tax incentives (Moore and Pecoraro, 2020, 2021). Figure E1 compares taxes across tax functions and the calculator. As discussed above, the tax-function parameter values used in this figure differ depending on the specified tax base. Figure E1's x-axis captures incomes between about \$440,000 and \$2,500,000. In 2022, the statutory top federal tax rate on ordinary income of 37% applied to taxable income in excess of \$539,900 for non-joint-filing tax units and \$647,850 for married individuals filing jointly. The straight lines for the tax functions show that only one tax rate applies (for single or married) for these functions. For each income level, the broad-base taxes (blue) are larger, as it pushes households higher up the ordinary tax schedule. Narrow-base taxes (black) are usually lower, as it ignores non-wage income subject to ordinary tax rates. In contrast, the tax calculator (red) captures heterogeneity from different tax bases, especially those for preferential capital income and housing.

# E Appendix Tables and Figures

**Table E1: Select Exogenous Parameters and Steady State Ratios**

| **Preferences** | **Parameter** | **Values** | **Moment** | **Target** | **Model** |
|---|---|---|---|---|---|
| Subjective discount factor | $\beta$ | 0.940 | Wealth-output ratio | 5.2 | 5.7 |
| WIU parameter | $o_t^z$ for z=6,7 | 12.5 | Top-1% wealth share | 35.9% | 33.4% |
| **Production** | | | | | |
| Private capital share of output | $\alpha$ | 0.353 | Moore and Pecoraro (2023) | | |
| Public capital share of output | $g$ | 0.078 | Moore and Pecoraro (2023) | | |
| Private capital depreciation rate | $\delta^K$ | 0.087 | Investment-capital ratio | 0.11 | 0.11 |
| Leverage cost: curvature | $\phi_1^c, \phi_1^n$ | 13.02, 7.36 | Tax elasticity of debt = 0.6 (de Mooij, 2011) | | |
| Leverage cost: level | $\phi_2^c, \phi_2^n$ | 0.81, 0.31 | Interest-output ratio | 0.04, 0.01 | 0.05, 0.03 |
| Corporate dividend payout ratio | $\varkappa^d$ | 0.09 | Dividend-output ratio | 0.02 | 0.02 |
| **Housing** | | | | | |
| Minimum house size | $\underline{h}^o$ | 0.60 | Homeownership rate | 0.64 | 0.62 |
| Housing depreciation rate | $\delta^o$, $\delta^r$ | 0.07, 0.08 | NA | | |
| Housing transaction cost | $\phi^o$, $\phi^r$ | 0.05, 0.05 | NA | | |
| Minimum home equity ratio | $\gamma$ | 0.05 | NA | | |

**Table E2: Steady State Capital Moments**

| **Ratio** | **Data** | **Model** |
|---|---|---|
| Private Non-Residential Capital / Total Private Capital (including durables) | 0.48 | 0.48 |
| Private Non-Residential Investment / Output | 0.13 | 0.18 |
| Pubic Investment / Public Capital | 0.04 | 0.04 |
| Pubic Capital / Output | 0.65 | 0.65 |
| Net Federal Debt / Output | 0.68 | 0.68 |

*Note:* With the exception of Net Federal Debt, all variables are 2012-2021 averages of data from the Bureau of Economic Analysis. Public investment is defined as all government non-residential, non-defense fixed investment. Net Federal Debt is the 2022 value of Federal Debt held by the public outside of the Federal Reserve system net of financial assets.

**Table E3: Steady State Labor Moments**

| | Data | | | Model | | |
|---|---|---|---|---|---|---|
| **Type of Worker** | **Full-Time** | **Part-Time** | **Unemployed** | **Full-Time** | **Part-Time** | **Unemployed** |
| Single | 0.61 | 0.24 | 0.15 | 0.60 | 0.25 | 0.15 |
| Married Primary | 0.90 | 0.08 | 0.02 | 0.91 | 0.09 | 0.00 |
| Married Secondary | 0.42 | 0.32 | 0.26 | 0.44 | 0.30 | 0.26 |

*Note:* Full-time work corresponds with hours greater than or equal to 35 per week, and part-time work corresponds with positive hours less than 35 per week. The 2015 Medical Expenditures Panel Survey is used to estimate the distribution of employment statuses across worker types.

**Table E4: True Base: Steady State Average Adjusted Gross Labor Income and Federal Labor Income Taxes (thousands 2022$)**

| **Productivity** | **Income** | | | | **Taxes** | | | |
|---|---|---|---|---|---|---|---|---|
| | Single | | Married | | Single | | Married | |
| | Target | Model | Target | Model | Target | Model | Target | Model |
| 1 | 4.7 | 4.7 | 23.9 | 23.9 | -0.9 | -0.9 | -3.8 | -3.8 |
| 2 | 21.2 | 21.2 | 64.4 | 64.5 | -2.5 | -2.4 | 1.1 | 1.1 |
| 3 | 35.7 | 35.6 | 102.4 | 102.4 | 0.3 | 0.3 | 6.5 | 6.5 |
| 4 | 54.4 | 53.3 | 146.9 | 146.8 | 3.8 | 3.8 | 14.8 | 14.8 |
| 5 | 78.7 | 78.6 | 208.9 | 208.4 | 8.3 | 8.3 | 28.0 | 28.0 |
| 6 | 127.3 | 172.1 | 383.6 | 383.1 | 18.6 | 18.5 | 73.4 | 73.3 |
| 7 | 342.9 | 342.6 | 1,401.6 | 1,400.7 | 78.9 | 78.8 | 403.7 | 403.4 |

*Note:* 'Income' is defined as the portion of labor income included in AGI as described in Appendix C. 'Taxes' is defined as the portion of federal individual income taxes allocated to labor income as a proportional basis less demographic specific transfers, $tra^{f,z}$. Only the working-age population is included. Data from the Individual Tax Model of Joint Committee on Taxation (2023)

**Table E5: True Base: Steady State Aggregate Federal Individual Income Tax Targets (% aggregate output)**

| | **Ordinary** | | **Preferential** | |
|---|---|---|---|---|
| | Target | Model | Target | Model |
| Noncorporate Income Tax Revenue | 1.26 | 1.29 | NA | NA |
| Dividend Tax Revenue | 0.06 | 0.06 | 0.19 | 0.19 |
| Interest Income Tax Revenue | 0.17 | 0.17 | NA | NA |
| Capital Gains Tax Revenue | 0.12 | 0.12 | 1.19 | 1.18 |

*Note:* "NA" is not applicable because no portion of noncorporate income and interest income can benefit from the lower preferential tax rate. These values include a proportional allocation of taxable distributions from retirement accounts to each listed income type. Data from the Individual Tax Model of Joint Committee on Taxation (2023)

**Table E6: Other Steady State Aggregate Tax Targets (% aggregate output)**

| **Federal Individual** | **Target** | **Model** |
|---|---|---|
| FICA/SECA Tax Revenue | 4.32 | 4.28 |
| Medicare Tax Revenue | 1.35 | 1.35 |
| Estate Tax Revenue | 0.12 | 0.12 |
| **State-local Individual** | **Target** | **Model** |
| Income Tax Revenue | 2.99 | 2.99 |
| Sales Tax Revenue | 5.23 | 5.23 |
| Property Tax Revenue | 3.71 | 3.70 |
| **Corporate Taxes** | **Target** | **Model** |
| Federal Corporate Income Tax Revenue | 0.68 | 0.67 |
| State-local Corporate Tax Revenue | 1.70 | 1.67 |

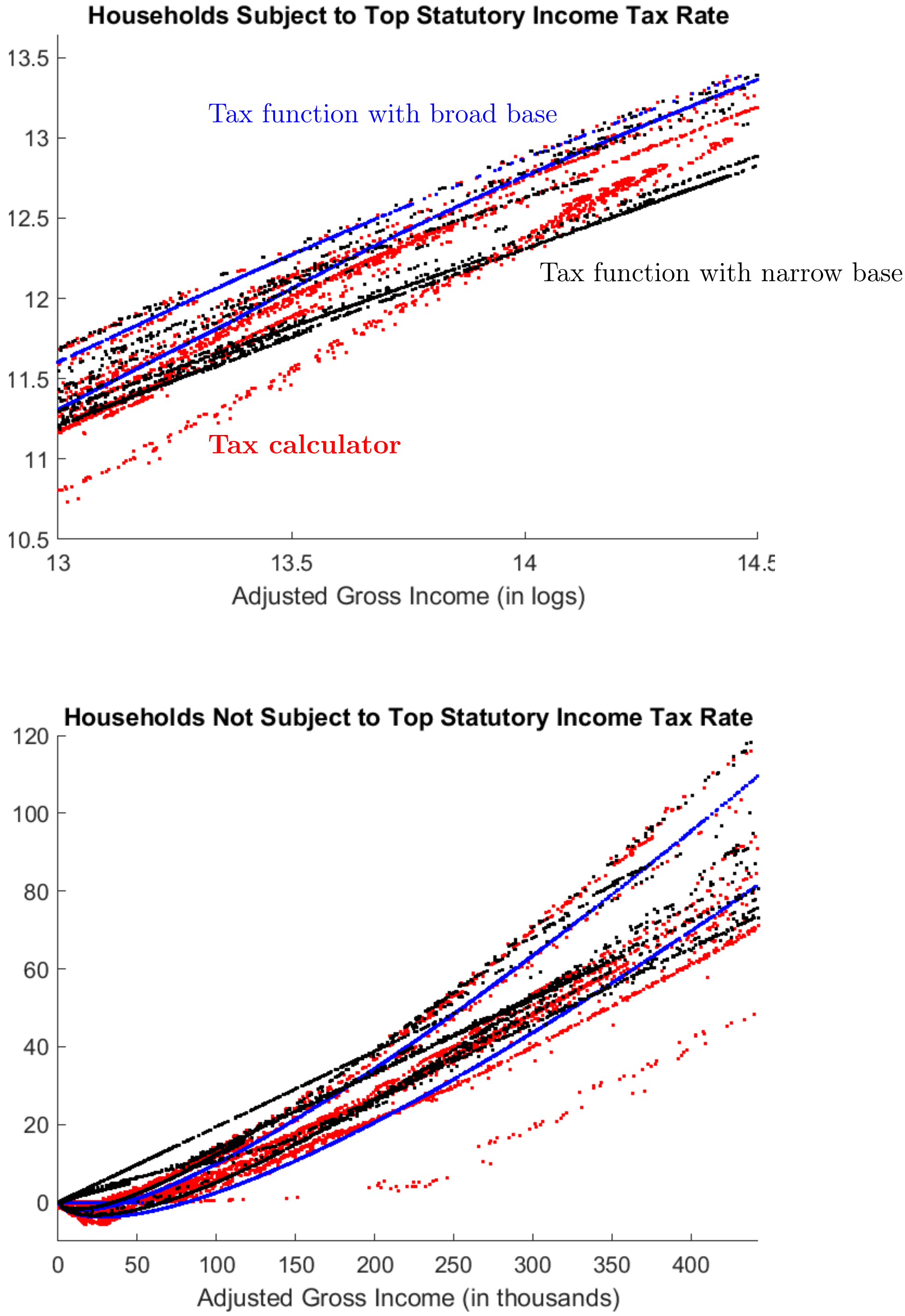
*Note:* Estimates from the Congressional Budget Office for 2022 provide the basis for the Federal tax revenue targets. Estimates from the Bureau of Economic Analysis for 2022 provide the basis for the State-local tax revenue targets.

**Table E7: Comparing Laffer Curve Flatness: Areas Under Laffer curves**

| | Tax Calculator with True Base | Tax Function with Broad Base | Tax Function with Narrow Base |
|---|---|---|---|
| *A: Full Firm Responses* | | | |
| Federal Indiv. Income Taxes | 1.0 | 1.6 | 6.1 |
| All Federal Taxes | 0.1 | 0.1 | 1.6 |
| All Government Taxes | 0.0 | 0.0 | 0.1 |
| *B: Partial Firm Responses* | | | |
| Federal Indiv. Income Taxes | 1.8 | 3.3 | 5.8 |
| All Federal Taxes | 0.3 | 0.6 | 1.4 |
| All Government Taxes | 0.0 | 0.0 | 0.1 |

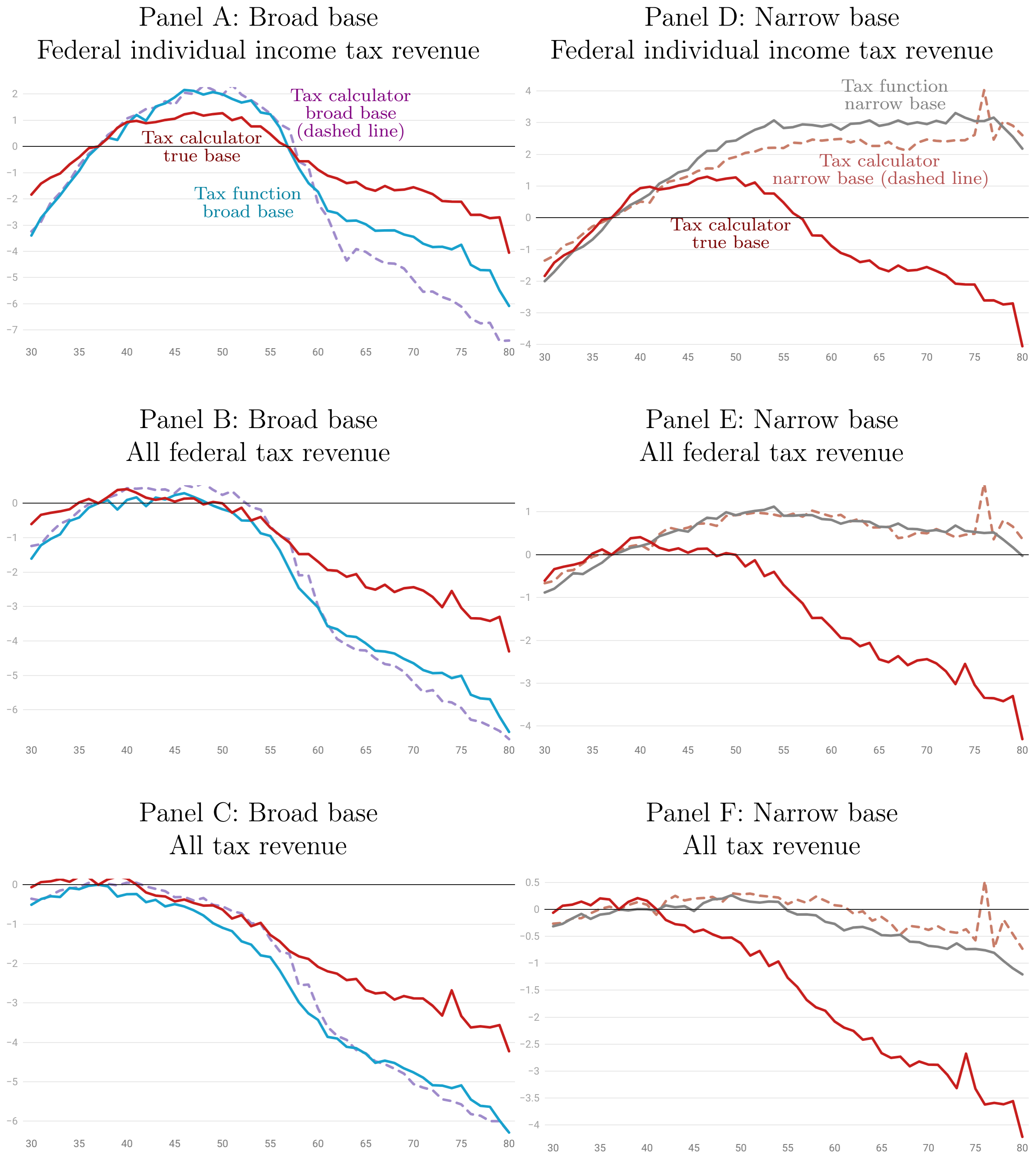
*Note:* Areas are inversely related to flatness. Areas under respective Laffer curves over the range of top tax rates that increase tax revenues relative to the present-law federal statutory top rate (37%) on ordinary income. Integrals normalized so that the top-rate Laffer curve with full firm responses (sectoral shifts) defined over federal individual income taxes equals one.

**Figure E1: Tax schedules (federal individual income tax), 2022**




*Note*: The three tax schedules are the tax calculator (red), tax function with broad base (blue), and tax function with narrow base (black). Y-axes are federal individual income taxes (top figure in logs). Top Figure: The x-axis captures incomes between about $440,000 and $3,270,000. In 2022, the statutory top federal tax rate on ordinary income of 37% applied to taxable income in excess of $539,900 for non-joint-filing tax units and $647,850 for married individuals filing jointly. As this figure uses log-log scales, the straight lines for the tax functions show that only one tax rate applies (for single or married) for these functions. For each income level, broad-base taxes (blue) are higher, as it pushes households higher up the ordinary tax schedule. The narrow-base taxes (black) are usually lower, as it ignores non-wage income subject to ordinary tax rates. The tax calculator (red) captures heterogeneity from different tax bases, especially those for preferential capital income and housing.

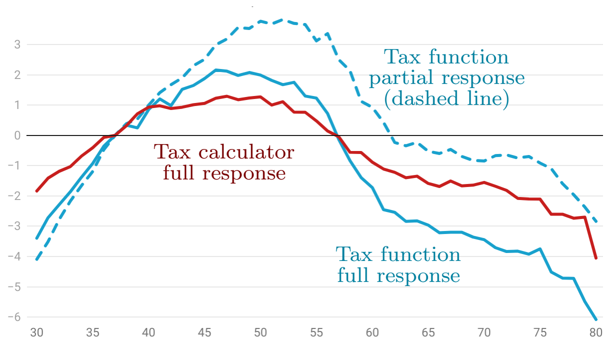
**Figure E2: Tax calculator mimics tax functions when aligning tax bases and including full firm response (alternative version of Figure 4)**



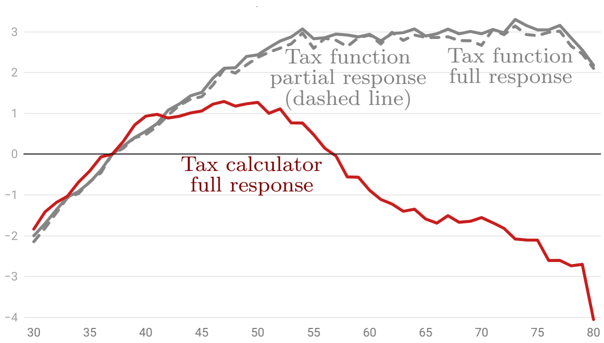

*Note*: Broad base treats all capital income as ordinary. Narrow base treats all capital income as preferential. The y-axis shows percentage-point changes in relevant tax revenues relative to baseline revenues at the top statutory federal individual tax rate on ordinary income of 37%. Top panels include only federal individual income taxes. Middle panels include all major federal taxes: individual income, payroll, corporate, excise, and estate taxes. Bottom panels include all major taxes from federal, state, and local governments. Each Laffer curve reflects the same policy change but accounts for different general equilibrium responses according to the tax base. The model is calibrated to the U.S. economy and tax provisions in 2022 and curves estimated for each percentage-point interval of the top rate.

**Figure E3: Laffer Curve Sensitivity to Partial or Full Firm Responses**

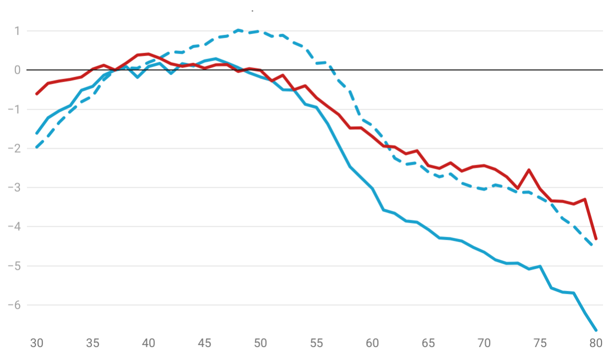
Panel A: Broad base
Federal individual income tax revenue



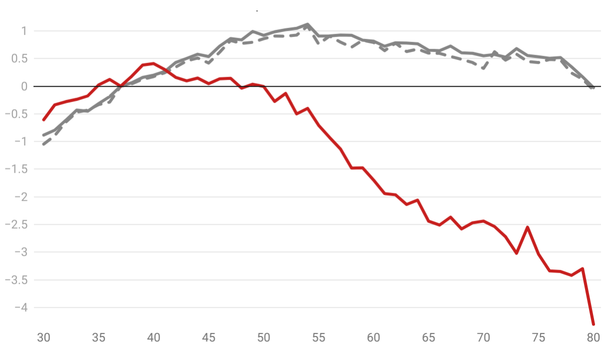

Panel D: Narrow base
Federal individual income tax revenue



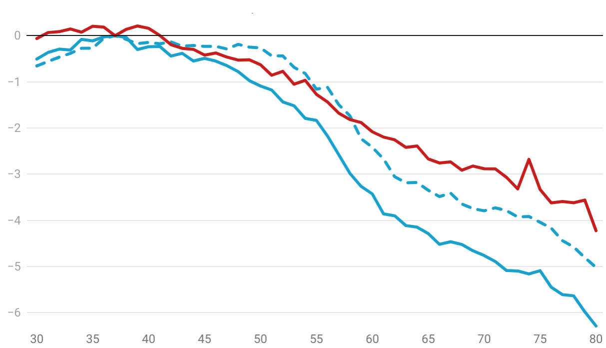

Panel B: Broad base
All federal tax revenue



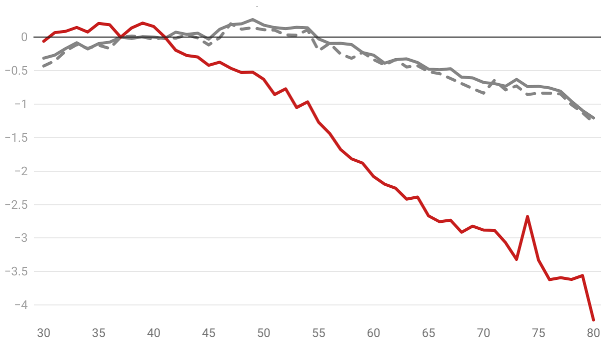
Panel E: Narrow base
All federal tax revenue



Panel C: Broad base
All tax revenue



Panel F: Narrow base
All tax revenue



*Note*: Broad base treats all capital income as ordinary income. Narrow base treats all capital income as preferential income. The y-axis shows percentage-point changes in relevant tax revenues relative to baseline revenues at the top statutory federal individual tax rate on ordinary income of 37%. Top panels include only federal individual income taxes. Middle panels include all major federal taxes: individual income, payroll, corporate, excise, and estate taxes. Bottom panels include all major taxes from federal, state, and local governments. Each Laffer curve reflects the same policy change but accounts for different general equilibrium responses according to the tax base. The model is calibrated to the U.S. economy and tax provisions in 2022 and curves estimated for each percentage-point interval of the top rate.

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