The Mechanics of Fiscal Policy

Theory, Data, and the Trade-offs of Government Intervention

$$\underbrace{G_t + T_t + i_t B_{t-1}}_{\text{Intervention}} = \underbrace{Rev_t}_{\text{Extraction}} + B_t - B_{t-1}$$

Fiscal policy is an optimization problem bound by arithmetic. This presentation explores the tension between the benefits of state intervention—public goods, insurance, redistribution—and the efficiency costs of the distortionary taxes required to fund them.

Based on "Chapter 15: Government and public policies" by Azzimonti, Heathcote, and Storesletten.

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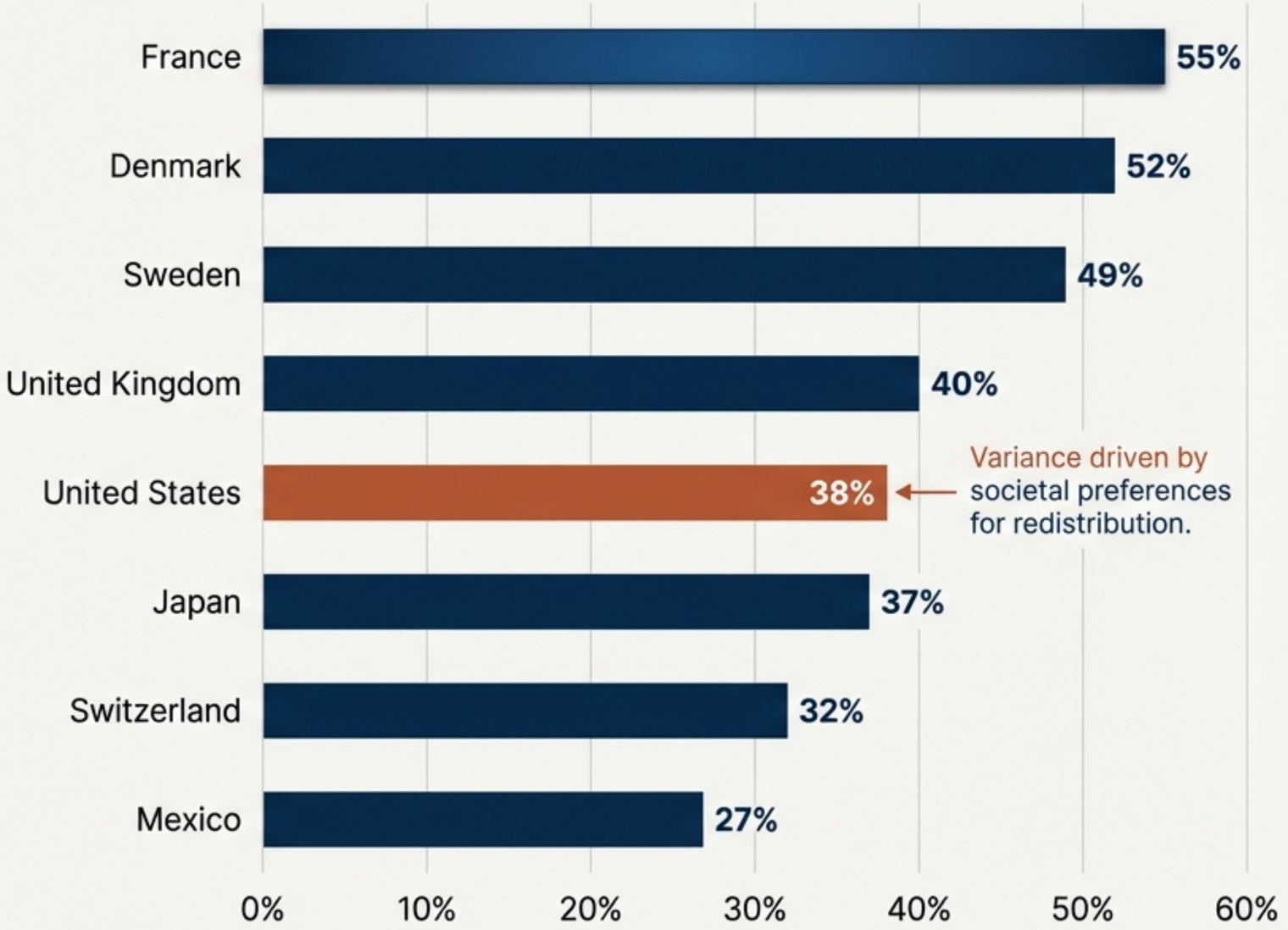
The State as a Dominant Economic Force

Across developed economies, the government controls a massive share of GDP. However, significant variance exists, suggesting that societies fundamentally differ in how they value the trade-off between public provision and the efficiency costs of taxation.

US Context (1970–2021):
Expenditures: 34% of GDP
Revenues: 28% of GDP

Government Spending as % of GDP (Avg 2010-2019)



Source: Adapted from Figure 15.1 (based on OECD data).

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The Three Rationales for Intervention

Why governments intervene in market economies

1. Public Goods

Definition: Goods that are non-excludable and non-rivalrous.

Mechanism: Corrects under-provision caused by the free-rider problem.

Examples: National Defense, Rule of Law, Basic Research.

2. Market Frictions

Definition: Intervention where private markets are incomplete due to information asymmetries.

Mechanism: Provides insurance where private markets fail.

Examples: Unemployment Insurance, Deposit Insurance, 2008 Bailouts.

3. Redistribution

Definition: Correcting market outcomes that are efficient but socially inequitable.

Mechanism: Transfers income from high-earners to low-earners.

Examples: Social Security, Food Stamps, Progressive Income Tax.

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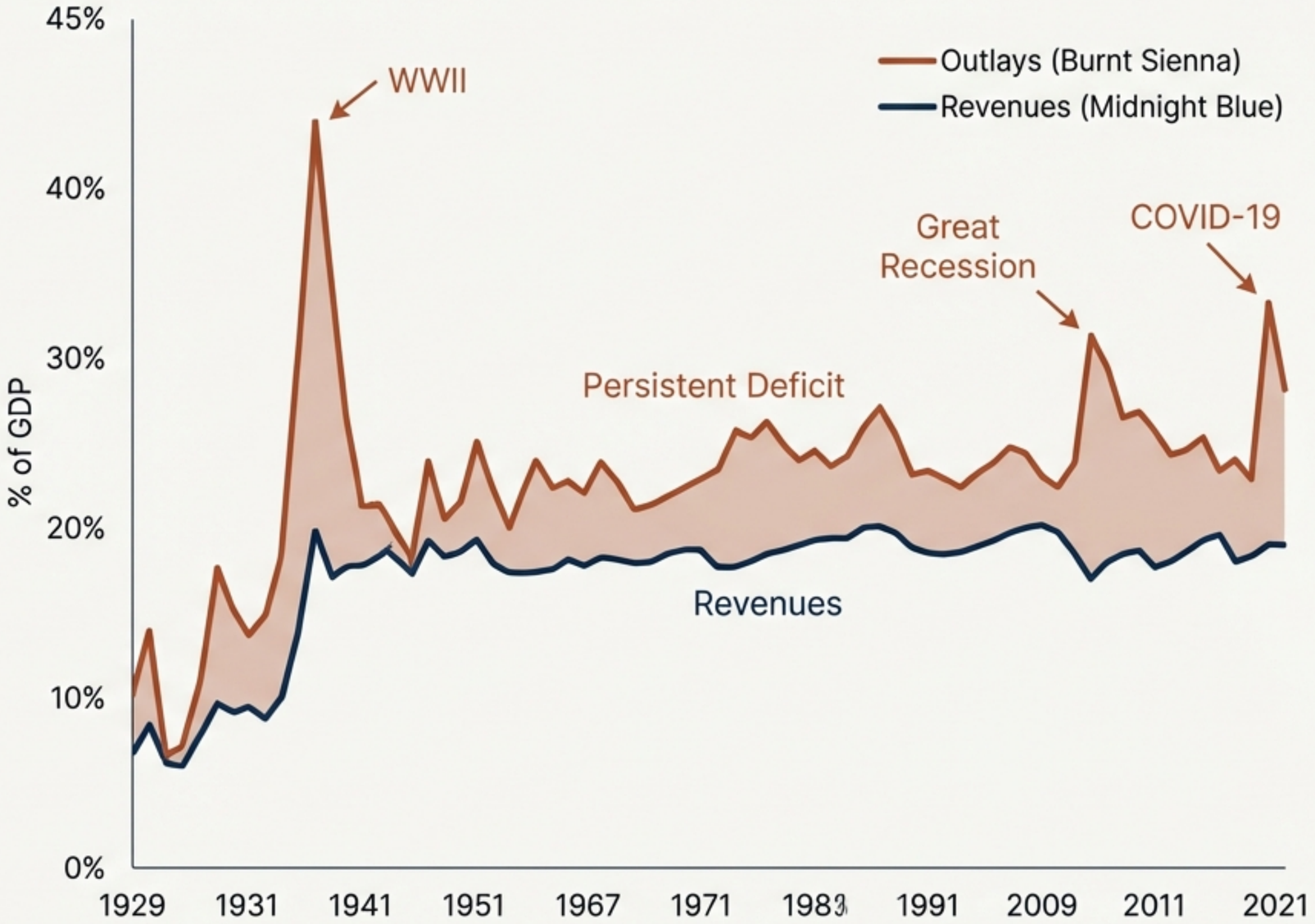
Deficits are the Rule, Not the Exception

Since 1970, US expenditures have consistently exceeded revenues. While revenues are relatively smooth, spending reacts violently to exogenous shocks.

- Wars and recessions drive expenditure spikes.
- The composition of spending has shifted from consumption (defense) to transfers (social insurance).
- Debt is the cumulative sum of these historical deficits.

US Federal Revenues vs. Outlays (1929–2021)



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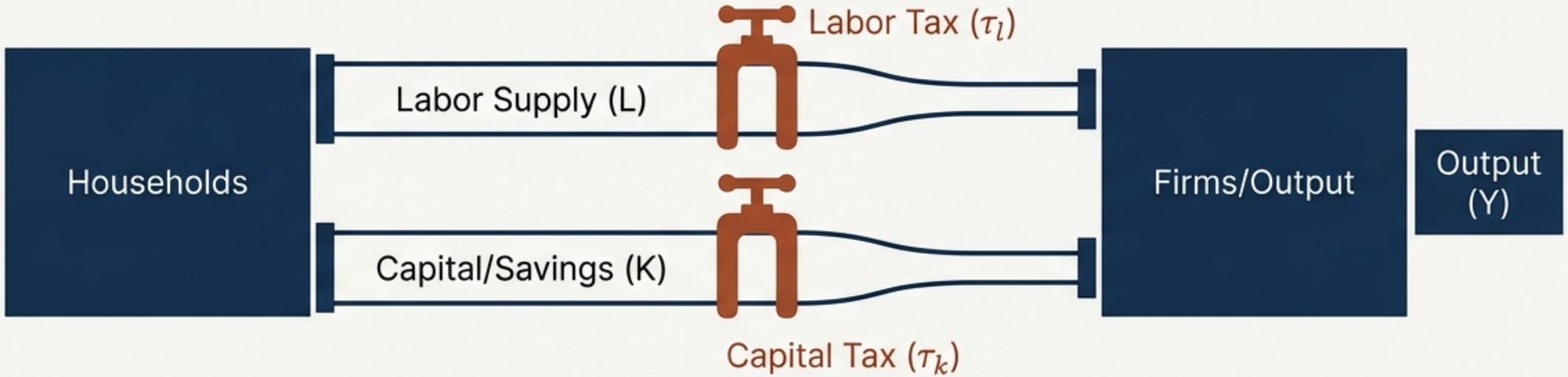
Taxation as a Distortionary Wedge

How taxes alter the Neoclassical Growth Model



Euler Equation: $$\frac{u_1(c_t, l_t)}{u_1(c_{t+1}, l_{t+1})} = \beta \left[1 + (1 - \tau_{k,t+1})(r_{t+1} - \delta)\right]$$

Reduces after-tax return to saving, discouraging capital accumulation.

The 'Wedge' between effort/saving and reward.

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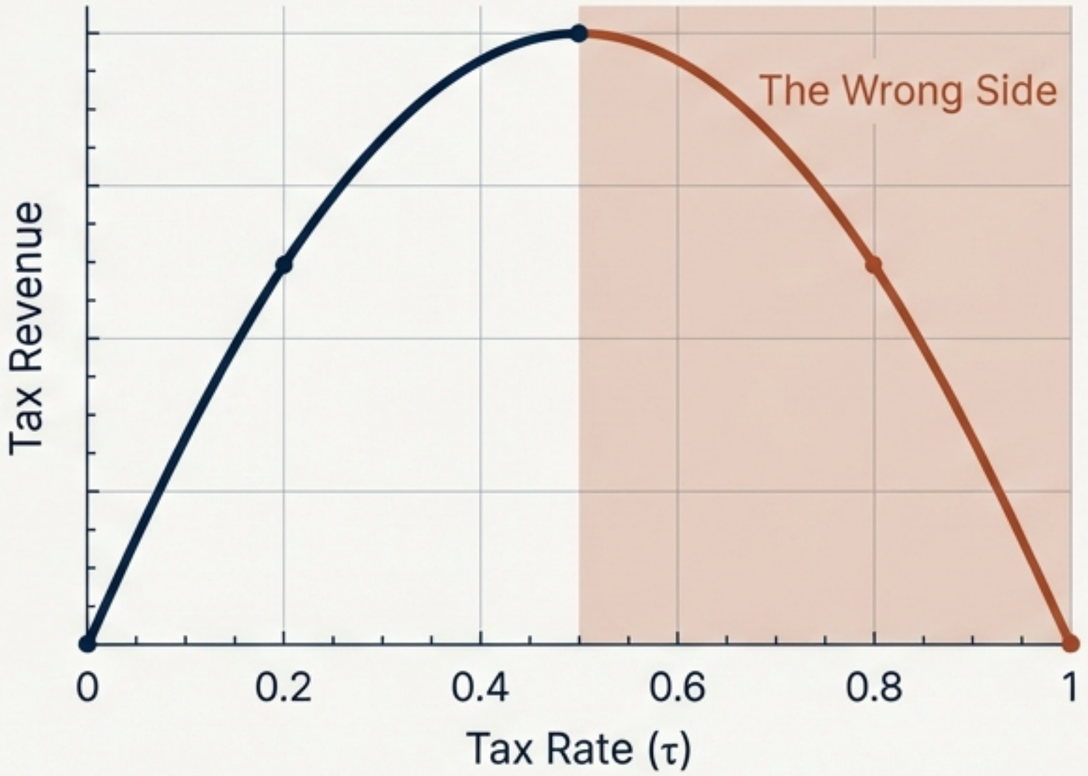
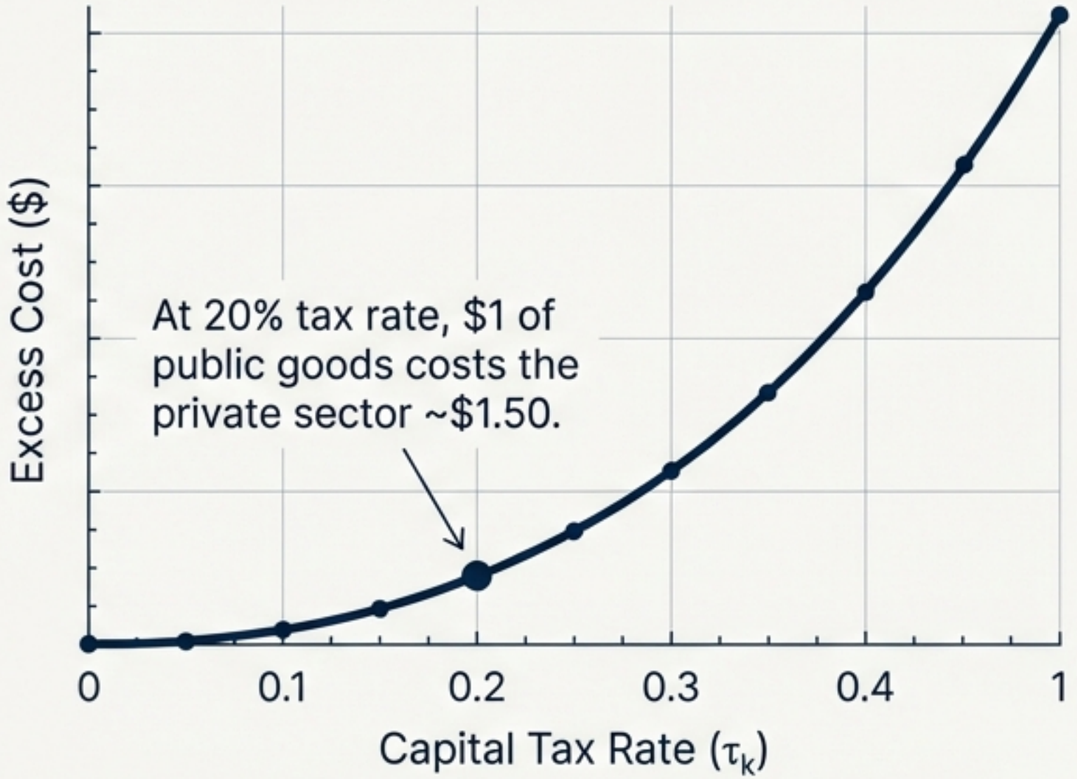
The Deadweight Loss of Extraction

Government spending is never ‘at cost.’ It carries an efficiency penalty because taxes shrink the base they extract from.

The Laffer Curve



The Excess Cost of Taxation



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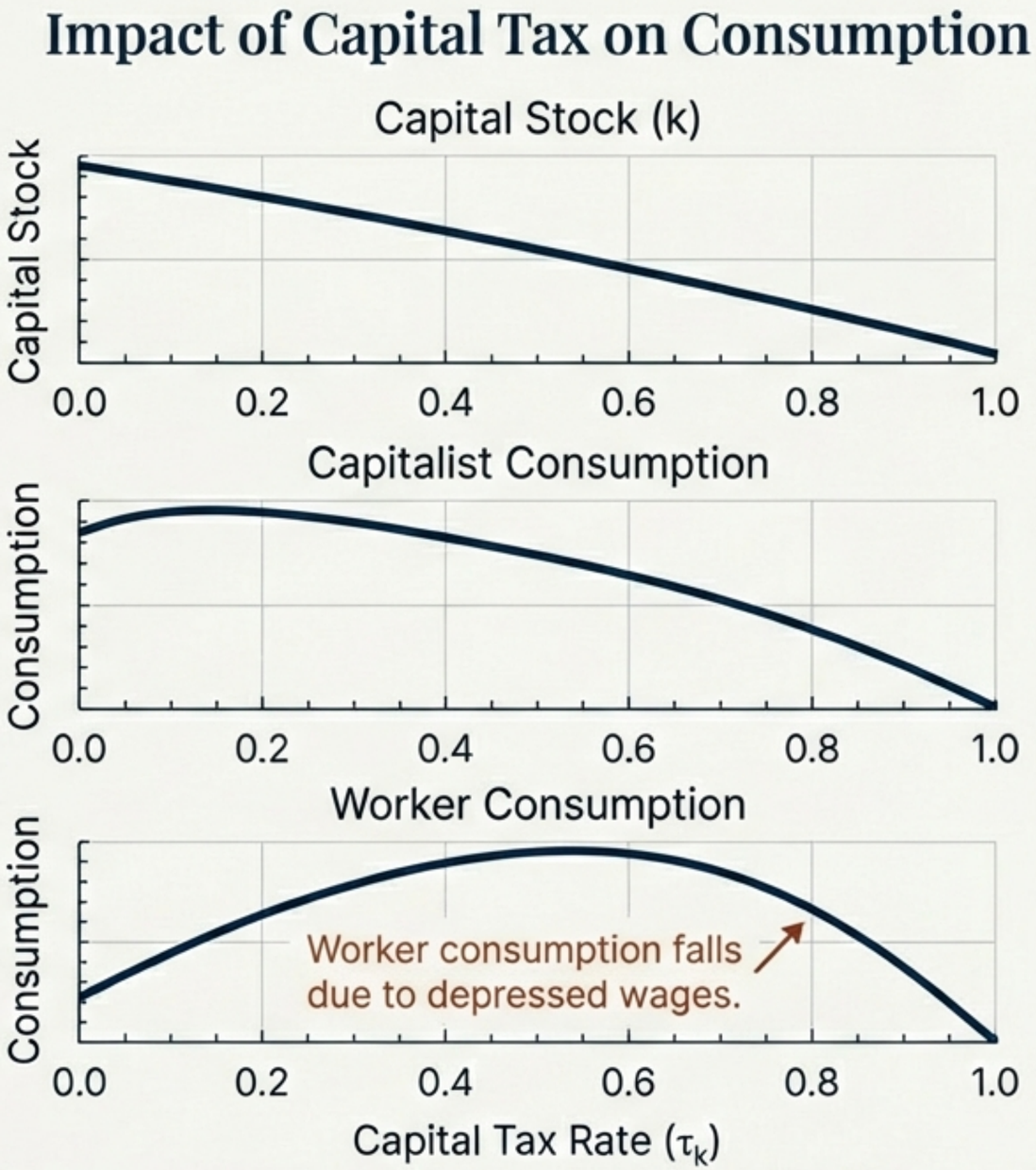
The Capital Tax Paradox

Political rhetoric often targets capital taxes as a way to tax the rich. However, in general equilibrium, taxing capital suppresses the capital stock.

Because labor productivity depends on capital., a lower capital stock reduces wages. Thus, workers bear the burden of capital taxes even if they own no capital.



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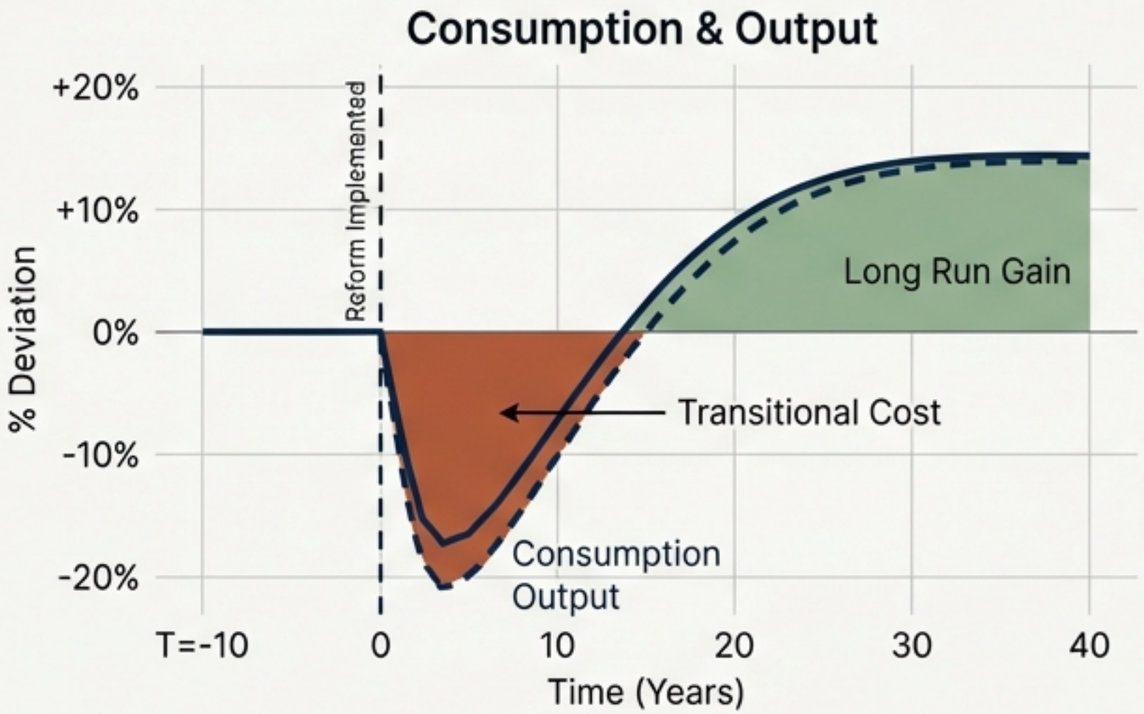
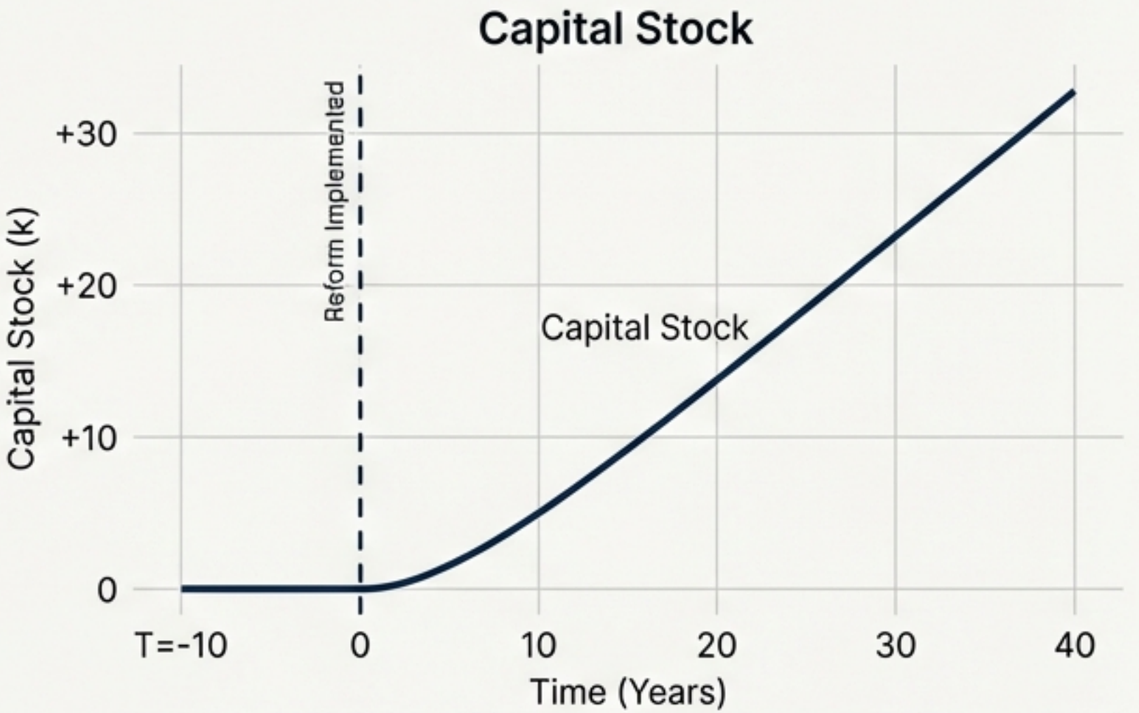
The Transition Problem

Short-Run Pain for Long-Run Gain

Impulse Response Analysis





Building the capital stock requires under-consuming today.

Eliminating capital taxes is optimal in the long run, but requires a painful period of high saving and low consumption. The current generation pays for the future's prosperity.

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The Ramsey Solution for Optimal Policy

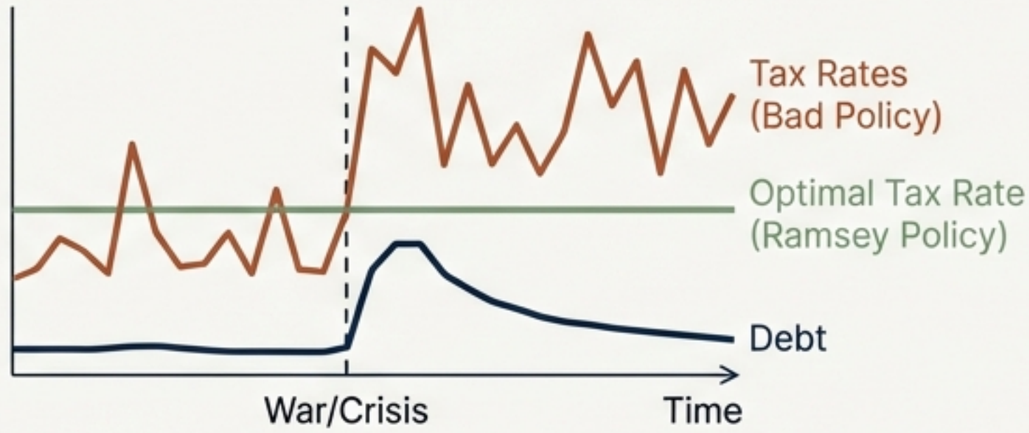
How a benevolent planner would set taxes

Pillar 1: Zero Capital Tax

$$\tau_k = 0$$

The government should commit to neither tax nor subsidize savings. Distorting intertemporal choices causes compounding damage to the capital stock.

Pillar 2: Tax Smoothing



Because the cost of taxation is convex, rates should remain constant. Finance temporary shocks (wars, pandemics) with debt, not tax hikes.

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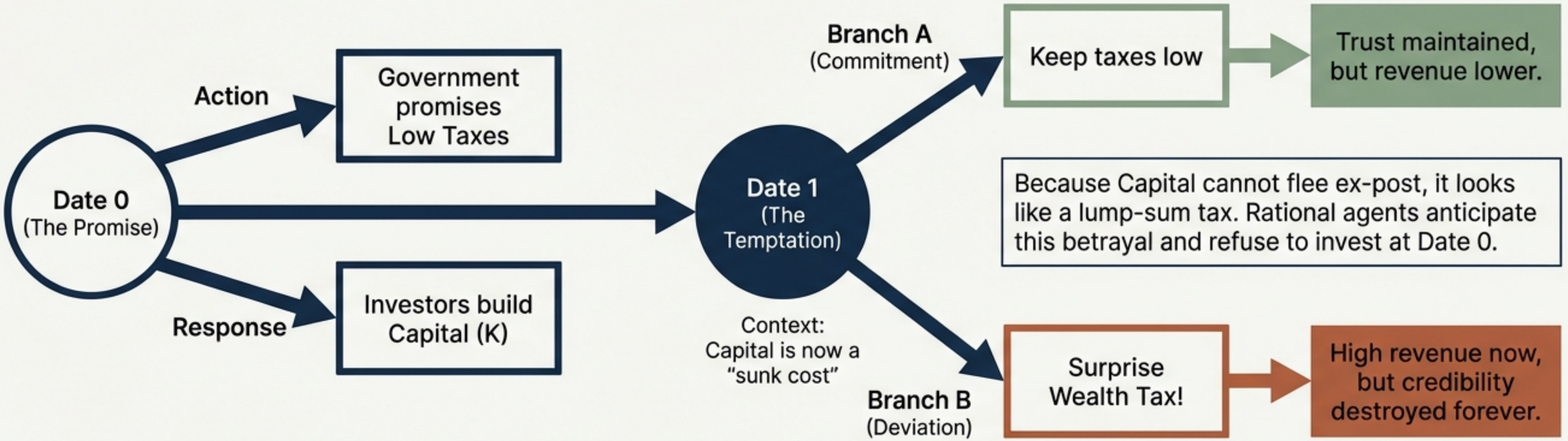
The Trap of Time Inconsistency

The optimal plan relies on **commitment**. Without it, the government faces a temptation to **confiscate wealth** once it has been created.



Result: A suboptimal equilibrium with low investment and low growth.

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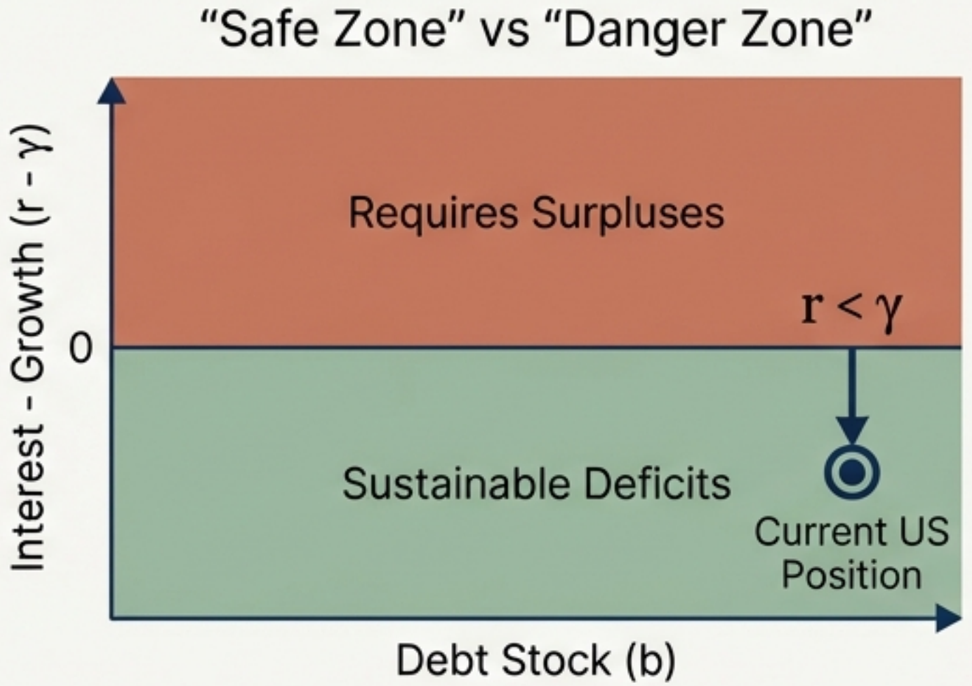
Debt Sustainability Arithmetic

Can the US run deficits forever?

$$d > (\gamma - r)b$$

d = Primary Deficit
γ = Economic Growth Rate
r = Real Interest Rate
b = Debt Stock



As long as growth (γ) exceeds interest rates (r), the US can stabilize debt while running deficits. If r rises above γ, debt explodes without painful austerity.

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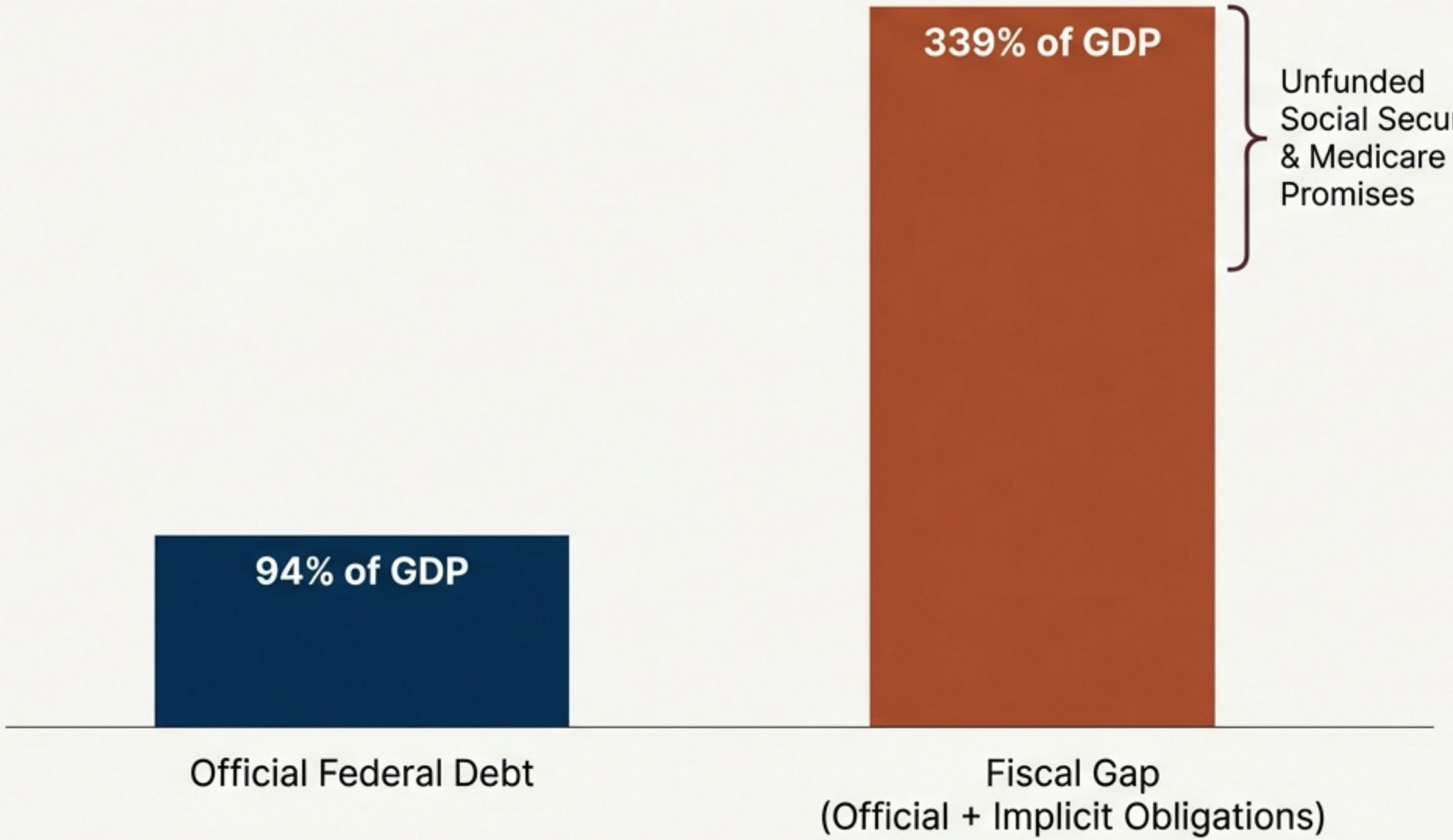
The Hidden Debt of Pensions

Official debt figures ignore future obligations. Pay-As-You-Go systems (Social Security) function as **implicit debt**, transferring wealth from young to old.



Demographic Crisis: With population aging (n falls) and secular stagnation (γ falls), the returns to the PAYG system system turn **negative**, effectively becoming a **heavy tax** on younger generations.

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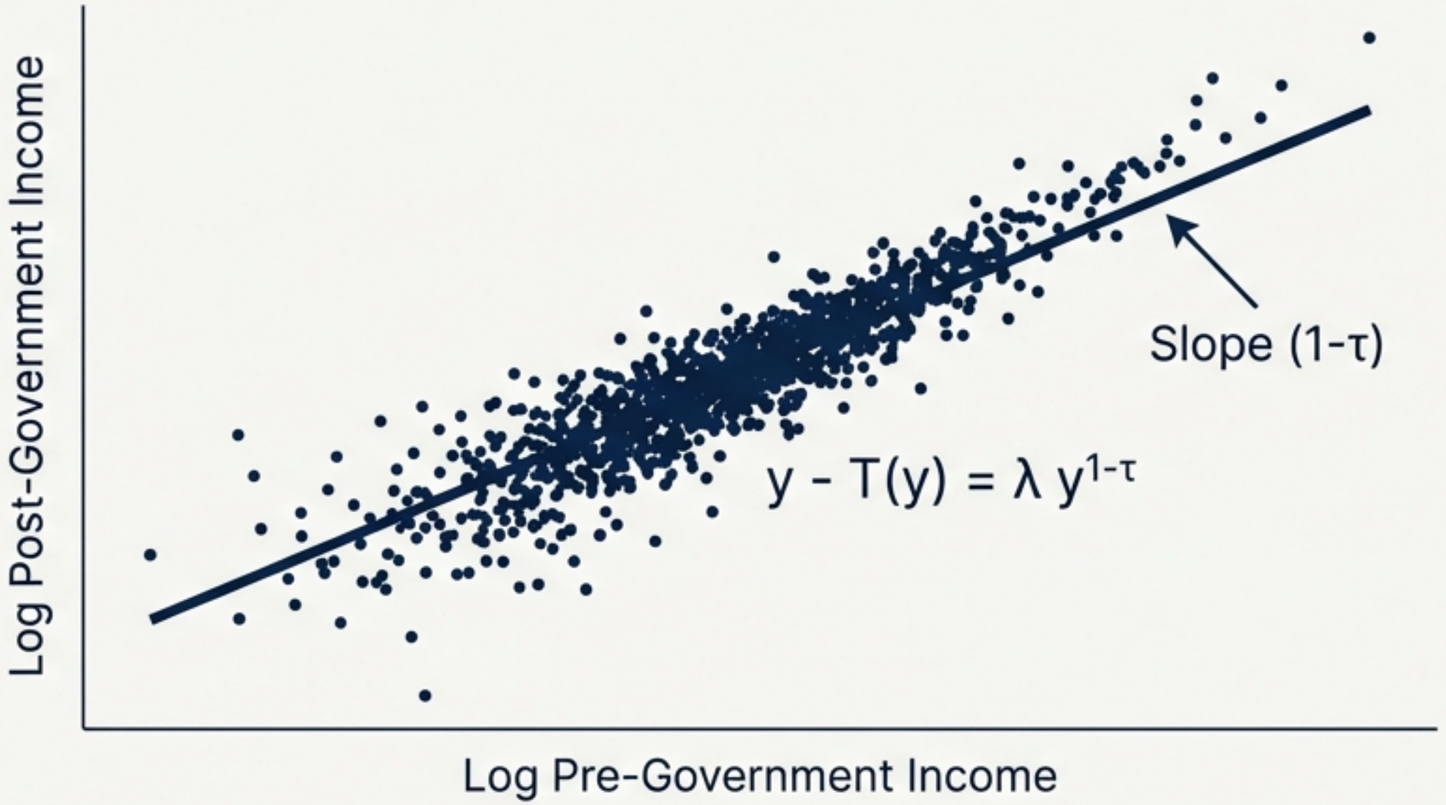
Redistribution vs. Efficiency

The US Tax System's Trade-off



- τ measures Progressivity
- High τ = More equality (consumption smoothing).
- High τ = Less labor supply (efficiency loss).

Policy is a choice between a smaller, **equal pie** or a larger, unequal one. The US system approximates a log-linear fit, balancing these opposing forces.

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The Great Trade-off: Summary

The Observation

- Government is a massive, necessary friction.
- Solves: Public Goods, Insurance, Inequality.

The Mechanics

- Funding requires **distortionary taxes**.
- Cost: Wedges in labor/capital markets.
- Fact: **Excess Cost > 0**.

The central tension of fiscal policy is balancing the social value of intervention against the mathematical cost of extraction.

The Optimization

- **Theoretical Ideal**: Ramsey Plan.
- Policy: Zero Capital Tax + Tax Smoothing.

The Reality

- **Constraints**: Time Inconsistency, Politics, Demographics.
- Result: Suboptimal, persistent **deficits** and **implicit debt**.

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Sources & Further Reading

- Primary Text: Chapter 15: Government and public policies. Azzimonti, Heathcote, and Storesletten.
- Ramsey, F. P. (1927). ‘A Contribution to the Theory of Taxation’.
- Barro, R. J. (1974). ‘Are Government Bonds Net Wealth?’
- Chamley, C. (1986). ‘Optimal Taxation of Capital Income in General Equilibrium’.
- Data: Bureau of Economic Analysis (NI.PA Tables), Congressional Budget Office (CBO).

Presentation designed based on the Mechanics of the State framework.

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