Capital Taxation

This isn't just something for rich people's accountants to understand!

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[1]With assistance from ChatGPT and Cursor.

Should we tax capital income (savings)?

Under the Haig-Simons definition of income—*everything you can consume or save*—should savings be taxed?

- Yes, because it is a form of income. Yes!
- No, because it is not a form of income.

Let's think through an example. Two people each earn \$100 this year and nothing next year. Savings earn an interest rate $r > 0$.

- Should they pay the same total taxes? Yes!

Person 1 spends all income now. Person 2 saves half, earns interest, and consumes it next year.

- Who pays more tax if we tax interest? Person 2!

Taxing capital income means taxing savings, i.e. *future consumption*.
That's the core idea behind today's lecture.

Goals today

- Assess whether taxation of savings/capital is functionally a tax on consumption
- Contrast the different approaches/answers to optimal capital taxation
- Evaluate the implications of different approaches to capital taxation

Taxation of interest

Let's put some math on that:

- Two periods, consumption C_1 and C_2
- Any saving S is invested giving two budget constraints:

$$\begin{aligned} S &= Y_1 - C_1 \quad \text{Key identity} \\ C_2 &= Y_2 + S(1+r) \end{aligned}$$

  where Y_t is income each period and r is interest rate

- Do you see a way to combine those two?
- Substitute for S in the second equation to get a single BC

$$C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r} \underbrace{\Longrightarrow}_{\text{Tax on } r} C_1 + \frac{C_2}{1+r(1-t)} = Y_1 + \frac{Y_2}{1+r(1-t)}$$

- Taxing interest changes the relative prices of C_1 and C_2
- This simple model has driven decades of debate

Budget Constraints with and without Tax on Savings

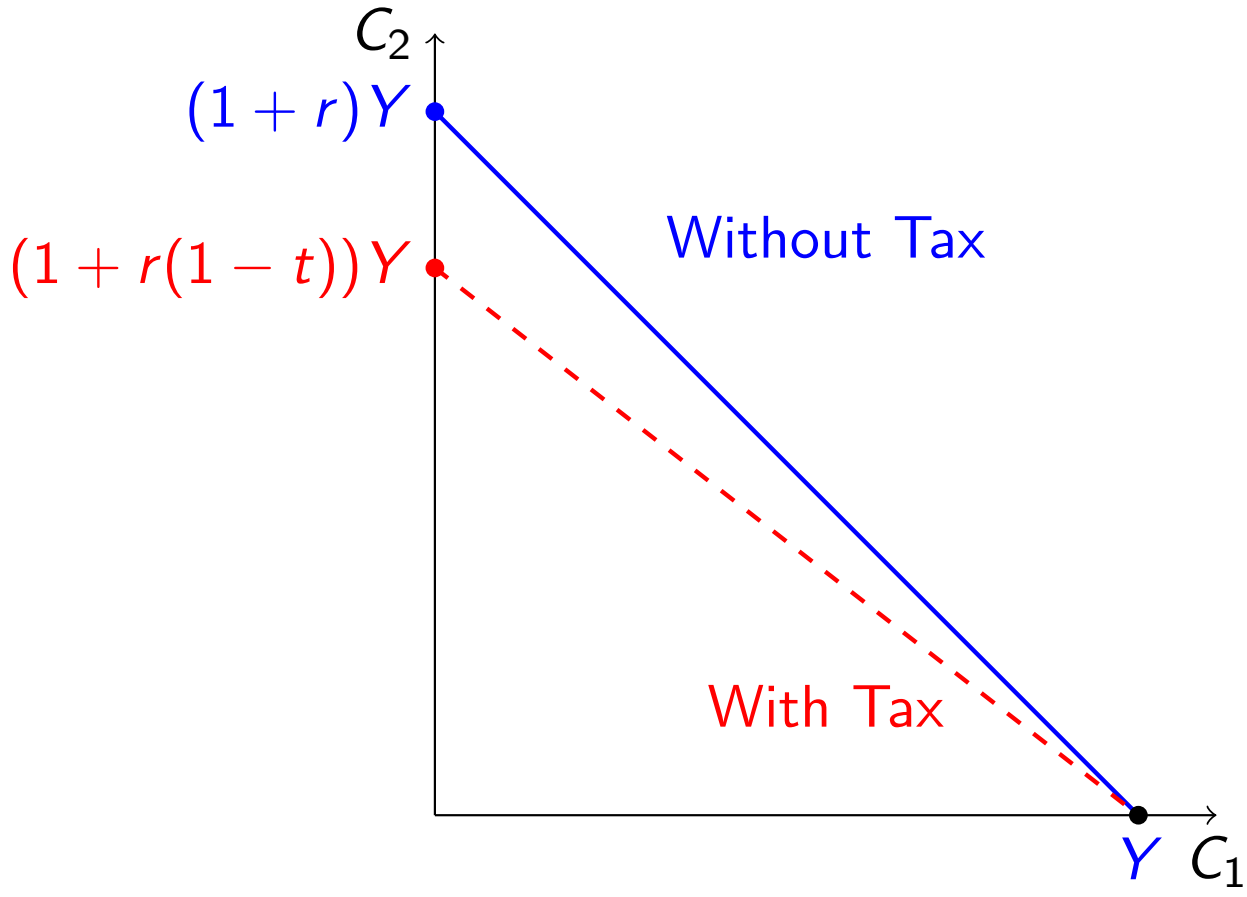


Figure: If Y is single income split between two periods, a tax on savings effectively taxes future consumption.

What did that model of savings leave out?

- Precautionary saving: uncertainty leads to higher and, likely, less tax-elastic saving
- No liquidity constraints: people may not be able to borrow or $r_{\text{borrow}} > r_{\text{lend}}$
- Inflation: taxes are levied on nominal rather than real interest rate. (Recall nom. int. rate = inf. rate + real int. rate)
- The role of social insurance and welfare programs — crowd out of private saving
- Self-control/behavioral models — suggestive evidence, unclear quantitative implications
- Empirically, the tax elasticity of savings is small, but many other related choices (capital gains, retirement savings, portfolio decisions) are very responsive. So is business investment.

Optimal capital taxes?

- What are the optimal taxes on capital income?
- It turns out there are many competing answers to this question
- We will discuss four approaches
- Each has its merits
- None has been sufficiently convincing to be the dominant approach

Four Ways to Think About Capital Taxation[2]

1. **Commodity taxation:** Taxing saving is like taxing future consumption more than current consumption. If both are equally elastic, tax them the same $\rightarrow$ no capital tax.
2. **Infinite horizon:** In long-run steady states (Chamley-Judd), even tiny taxes on capital compound distortions infinitely $\rightarrow$ optimal tax ≈ 0. Better for government to commit to a single consumption path of taxes OR tax initial assets highly, then go to zero.
3. **Redistribution / information:** If consumption choices don't reveal extra info about ability (Atkinson-Stiglitz), don't tax saving separately.
4. **Uncertainty / insurance:** When assets weaken work incentives, taxing them can help target aid (e.g., asset tests in welfare programs).

[2] See appendix for more details on each.

Chamley-Judd and Its Critics

- Classic result (Chamley 1986; Judd 1987): In the long run, optimal tax on capital $= 0$. Any positive rate distorts saving forever.
- Intuition: once labor income is taxed, capital taxes are redundant and inefficient.
- Critiques:
  - Werning & Straub (2020): time inconsistency, borrowing limits, or heterogeneity $\Rightarrow$ positive capital tax optimal.
  - Piketty & Saez: with inheritances, taxing wealth can improve equity and efficiency. (Not quite 2nd welfare theorem, but similar intuition!)
- Bottom line: Results depend on assumptions about horizon, commitment, and redistribution.

Realization vs Accrual — Lock-in effect

- Two periods, interest rate of r, tax rate on interest income is t, \$1 investment
- Taxation of accrual (e.g. interest income):

$$(1 + r(1 - t))^2 = 1 + 2(1 - t)r + (1 - t)^2 r^2$$

- Taxation of realization (e.g. capital gains)

$$(1 + r)^2 - t\left((1 + r)^2 - 1\right) = 1 + 2(1 - t)r + (1 - t)r^2$$

- The difference is $tr^2(1 - t)$ — the after tax return on tr: under realization taxes, the individual holds and earns return on tr, opposite for accrual taxes
- Creates lock-in effect: "step up in basis at death": inheritor taxed on gains since inheriting, meaning gains are: $1 + r(1 - t)$ if sold while alive, $1 + r$ if held until death.

Deferral

- How/if accrual is taxed is important for understanding many different tax planning situations.
- Examples:
  - Decision to realize capital gains
  - Choice between tax-deferred (traditional) and taxable (Roth) retirement accounts
  - Deferred compensation schemes
  - Retention of profits within a firm
  - International taxation and repatriation of profits

Taxation of different components of capital income

- Investment of \$1 that pays $1 + r$ tomorrow. What is r?
- Split the rate of return r into three components:

$$r = \bar{r} + \varepsilon + x$$

  - $\bar{r}$ is a normal (risk-free) rate of return
  - ε is a risky (random) component. Possibly $\mathrm{E}[\varepsilon] > 0$ — compensation for risk
  - x are rents — abnormal returns (monopolistic profits, insider knowledge, compensation disguised as capital income)
- Main arguments against capital taxes about $\bar{r}$: penalizes savers for economic growth.
- Tax on ε not a big concern if Domar-Musgrave (next slide) relevant, but it depends on implementation
- High tax on pure rents justifiable – why? Information asymmetry

Domar-Musgrave effect

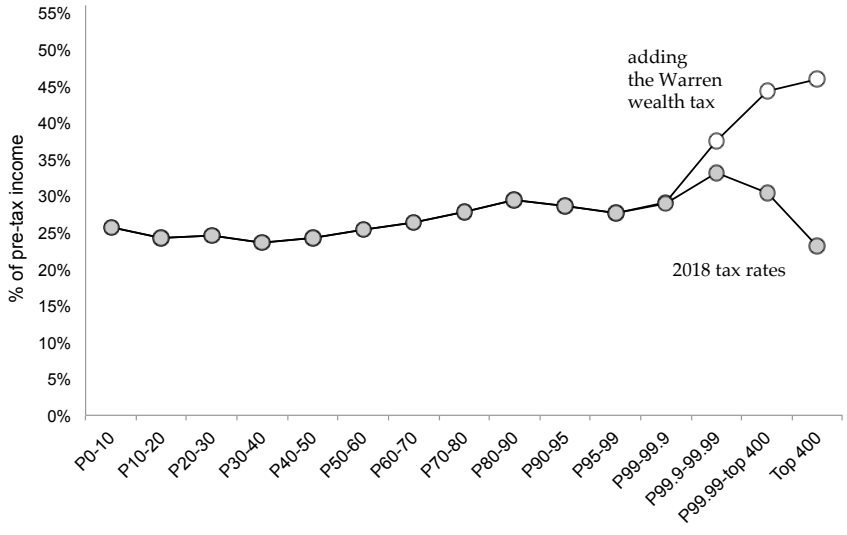
- Government as a "silent partner"
  - A \$100 investment can yield \$110 or \$90, each with a 50% chance. With a 50% tax on returns and deductible losses, the perceived outcomes are \$105 or \$95, reducing investor risk and encouraging risk-taking.
- Treatment (exempting) of the overall return rate is crucial
- In practice, government does not participate fully in losses.
- Progressive taxation taxes winnings more than subsidizes losses, discouraging projects, complicating D-M effect

Should we tax wealth or returns to wealth?

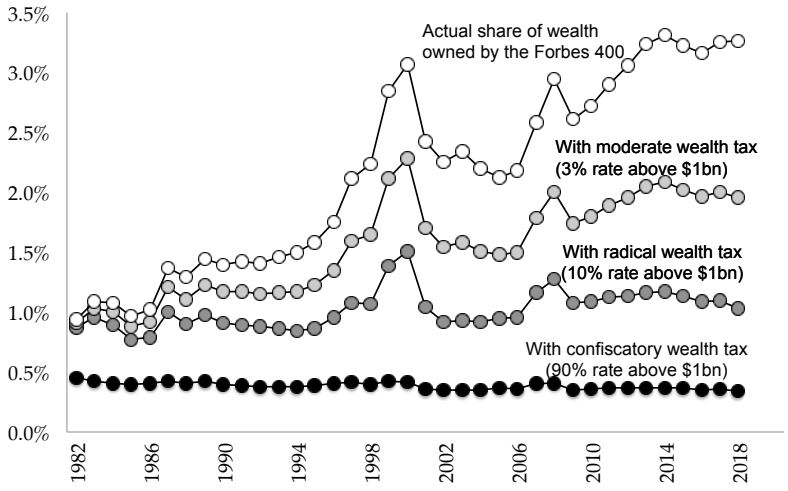
- Taxing **returns** (r): focuses on new income from saving $\rightarrow$ affects incentives to save and invest.
- Taxing **wealth** ($1 + r$): focuses on accumulated stock $\rightarrow$ hits existing fortunes, not just new gains.
- For $t^r\,\mathbb{E}[r] = t^W(1 + \mathbb{E}[r])$, $t^W \ll t^r$
  - Intuition: $r = 5\%$ and $t^W = 5\%$, $t^r \approx 100\%$
  - Implication: for the same revenue, a wealth tax falls more lightly per dollar of return—but applies every year.
  - Discourages high returns less than capital income taxes do: more risk-taking? (Allais 1966; Guvenen et al. 2019)
  - Curbs extreme accumulation (billionaires do not persist)

This trade-off sits at the heart of today's debate between proponents (Saez/Zucman) and opponents/skeptics (Kopczuk/Auerbach/Hassett).

Consequences of wealth taxes



(a) Share of income paid in taxes with a wealth tax of 2% above \$50M, 3% above \$1B versus 2018 tax rates.



(b) Share of wealth by Forbes 400 under different plans.

Figure: Various wealth taxes consequences for pre-tax income owed and wealth holdings. (Saez and Zucman 2019)

Wealth Tax: Competing Views — (Economic Logic)

Dimension	**Proponents**	**Opponents**
Goal	Restore progressivity	Redundant; fix existing taxes
Revenue	Broad base, modern enforcement	Overstates yield; taxes normal returns
Behavior	Small avoidance; may spur risk-taking	Elastic, evasive, discourages saving
Rents vs. Return	Simple tax on all capital	Misses rents; high tax on safe assets
Time Horizon	Ongoing fairness tool	Only one-time levy makes sense
Bottom line	Directly targets entrenched wealth	Prefer cap gains and estate reforms

Wealth Tax: Competing Views — (Admin & Lessons)

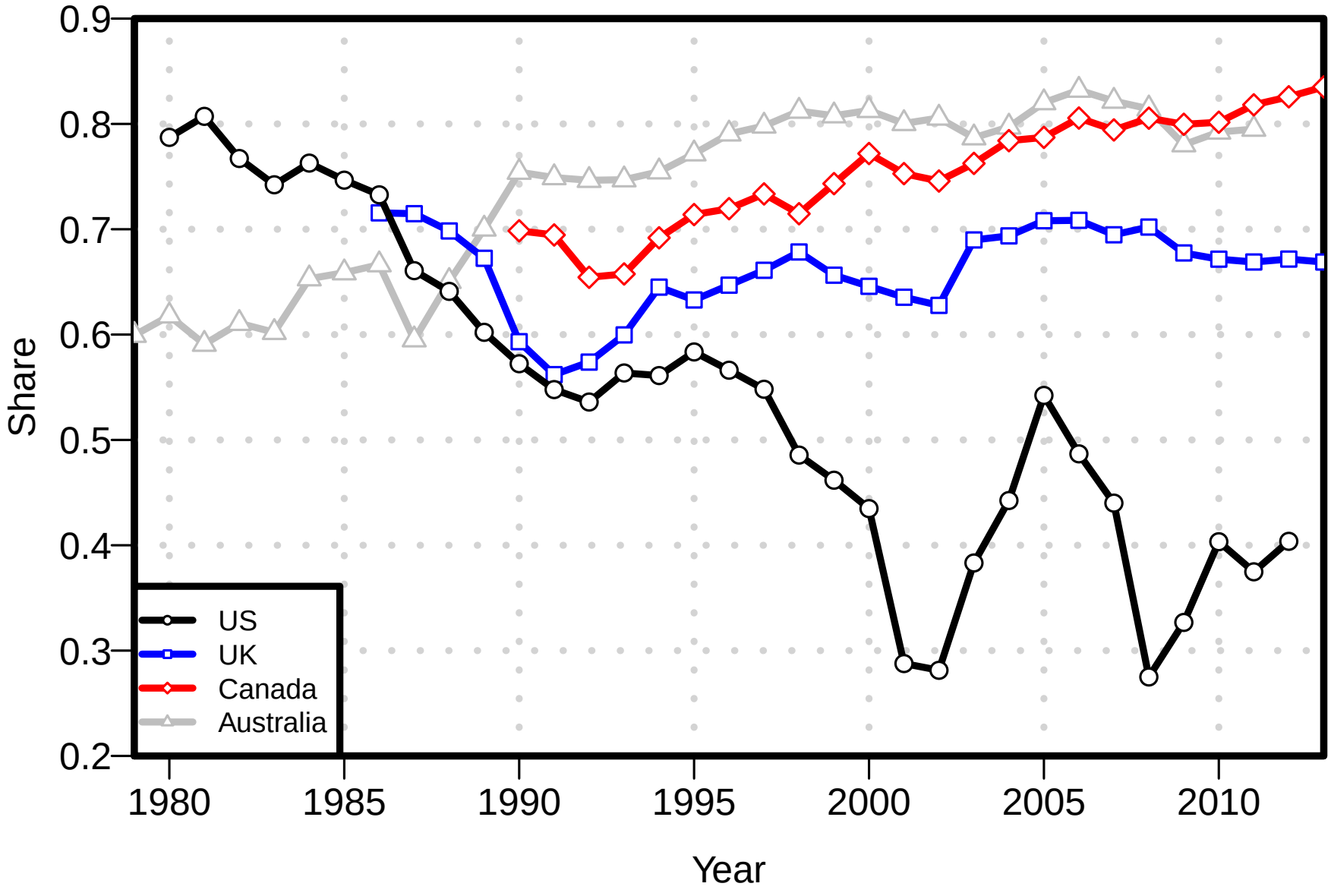
Dimension	**Proponents**	**Opponents**
Admini	Feasible w/ data	Hard to value; costly to enforce
Ownership	Limits dynasties	Weakens founder control
Charity	Include foundations	Reform rules instead
Europe	Design flaws doomed it	Failures show fragility
Politics	Visible, polls well	Risk of flight and backlash
Bottom line	Bold fix for inequality	Blunt, fragile instrument

How are businesses taxed?

Two general approaches:

- Treat profits as ordinary income of owners, "pass through" taxation (Accrual approach)
  - This is the usual treatment of sole proprietors/self-employed and regular partnerships
  - It may also apply to other businesses depending on the tax regime. In particular, it applies to S-corporations and partnerships in the US
  - Qualification: it can still retain classification of income with potentially preferential treatment (e.g., dividends, capital gains, rents)
- Two tier system with (usually) corporate tax and individual taxation of dividends and capital gains. It applies to all C-corporations in the U.S. (Realization approach)

Share of business income subject to corporate tax

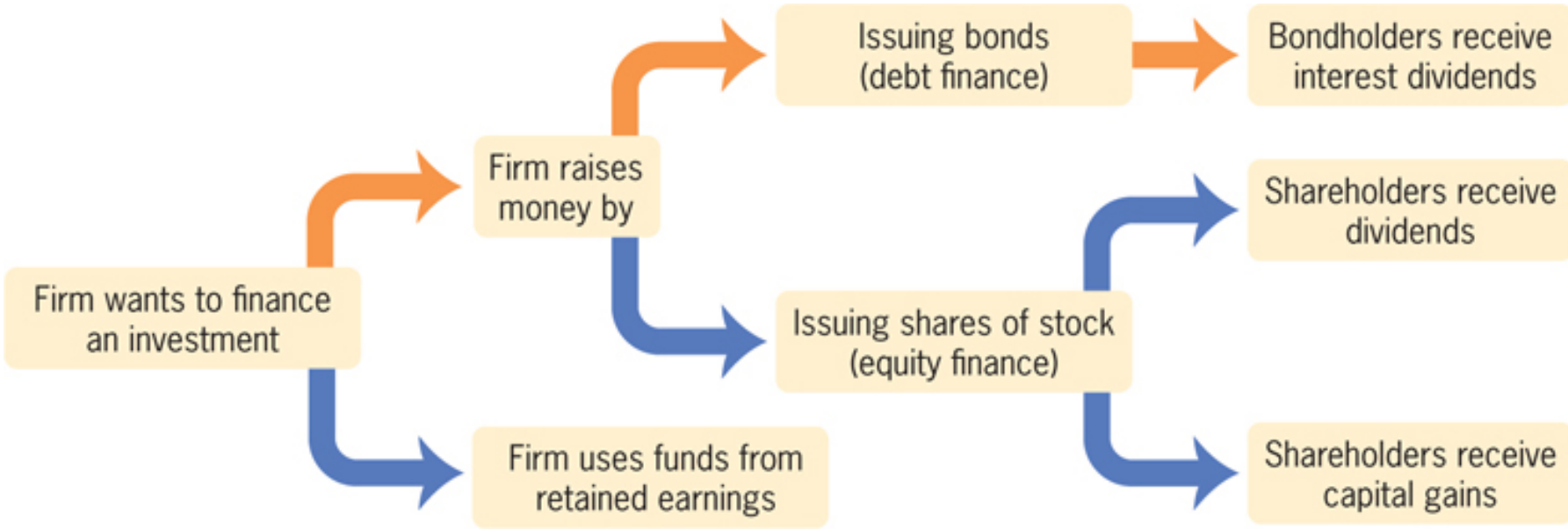


Corporate Taxation

Why tax corporate income? Corporations are owned by individuals — personal income tax could be enough

- reduce tax avoidance: without corporate income taxes, retaining income in corporation allows growth without taxation
- user-fee? shareholders enjoy limited liability protection
- nontaxable or hard to tax shareholders: institutional investors (e.g. pension funds, university endowments), foreigners

How are corporations funded?



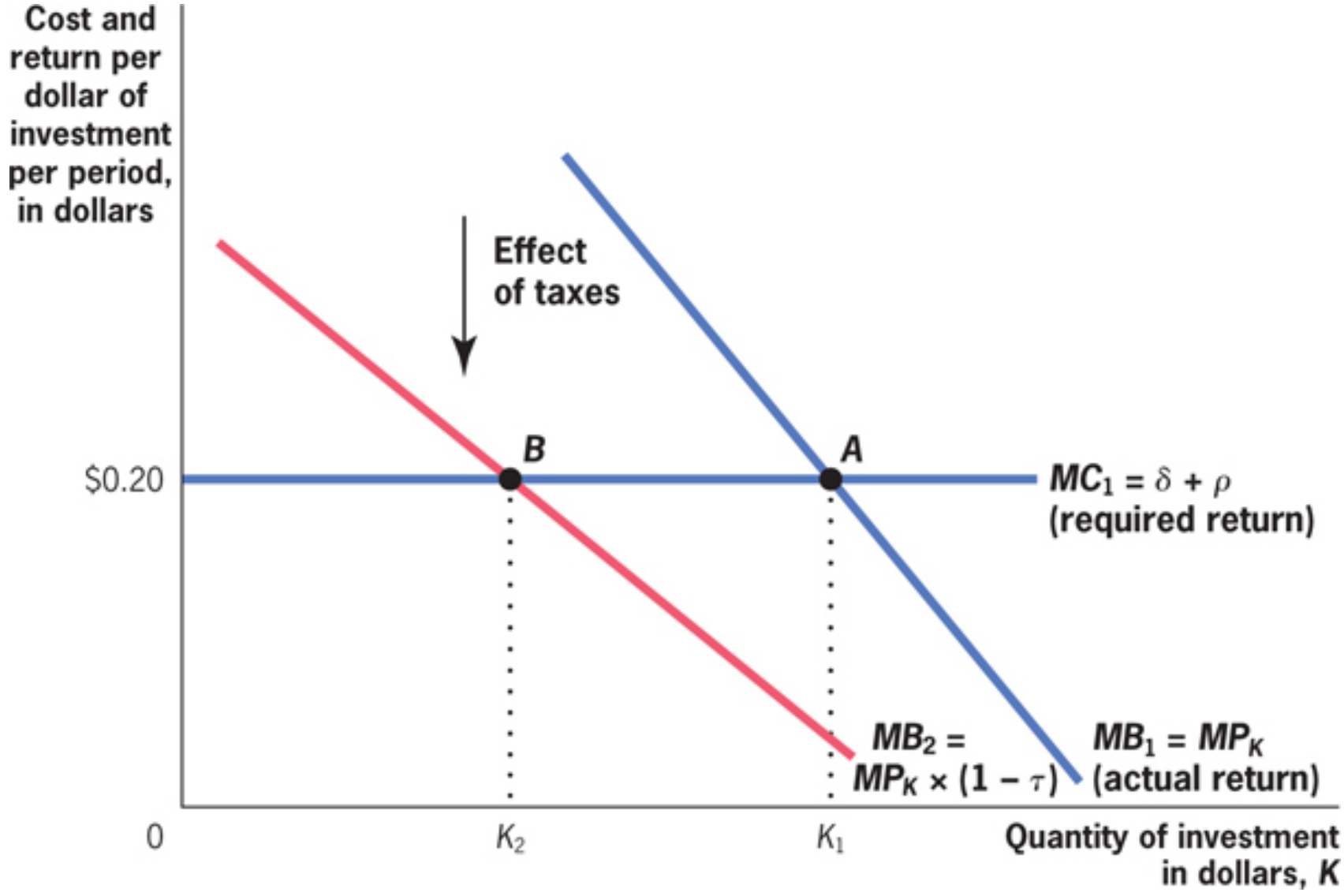
Structure of corporate taxation

- Taxes $= \tau \cdot$ (Revenues $-$ Expenses) $-$ Investment tax credit
- Expenses include
  - expenditures for goods and services (inputs, rents, advertising, compensation to employees etc.)
  - interest payments
  - depreciation
- The tax rate has beeen reduced by the 2017 TCJA from 35% to 21%.

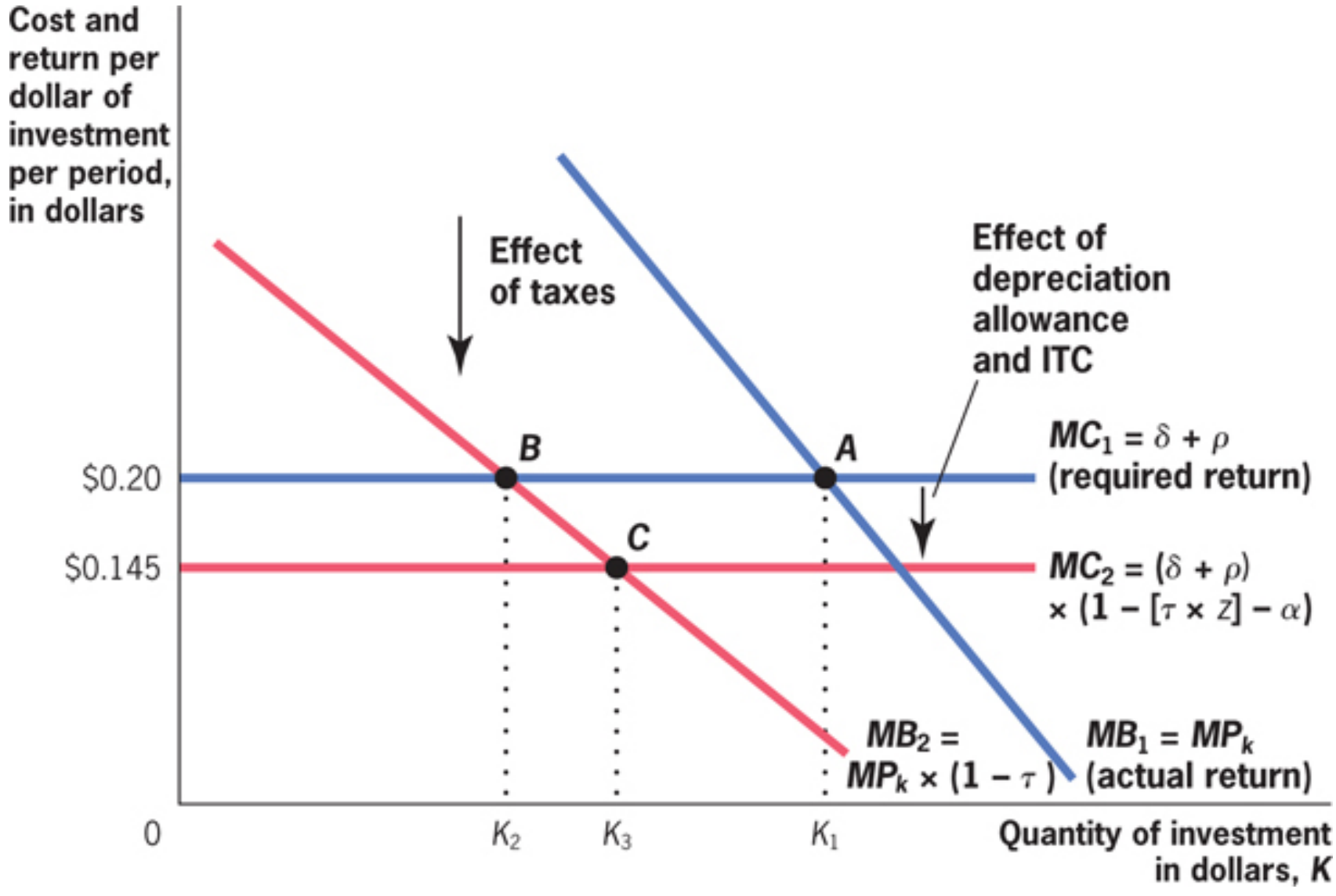
Treatment of investment assets

- depreciation allowances — as the asset depreciates over time, firms are allowed to write off the value of investment.
- getting depreciation allowances to match economic depreciation is hard. In practice, it affects the relative value of old and new assets and thus distorts choices.
- Investment tax credits
- Alternative: expensing. Deduct the full cost of investment immediately, in effect now.

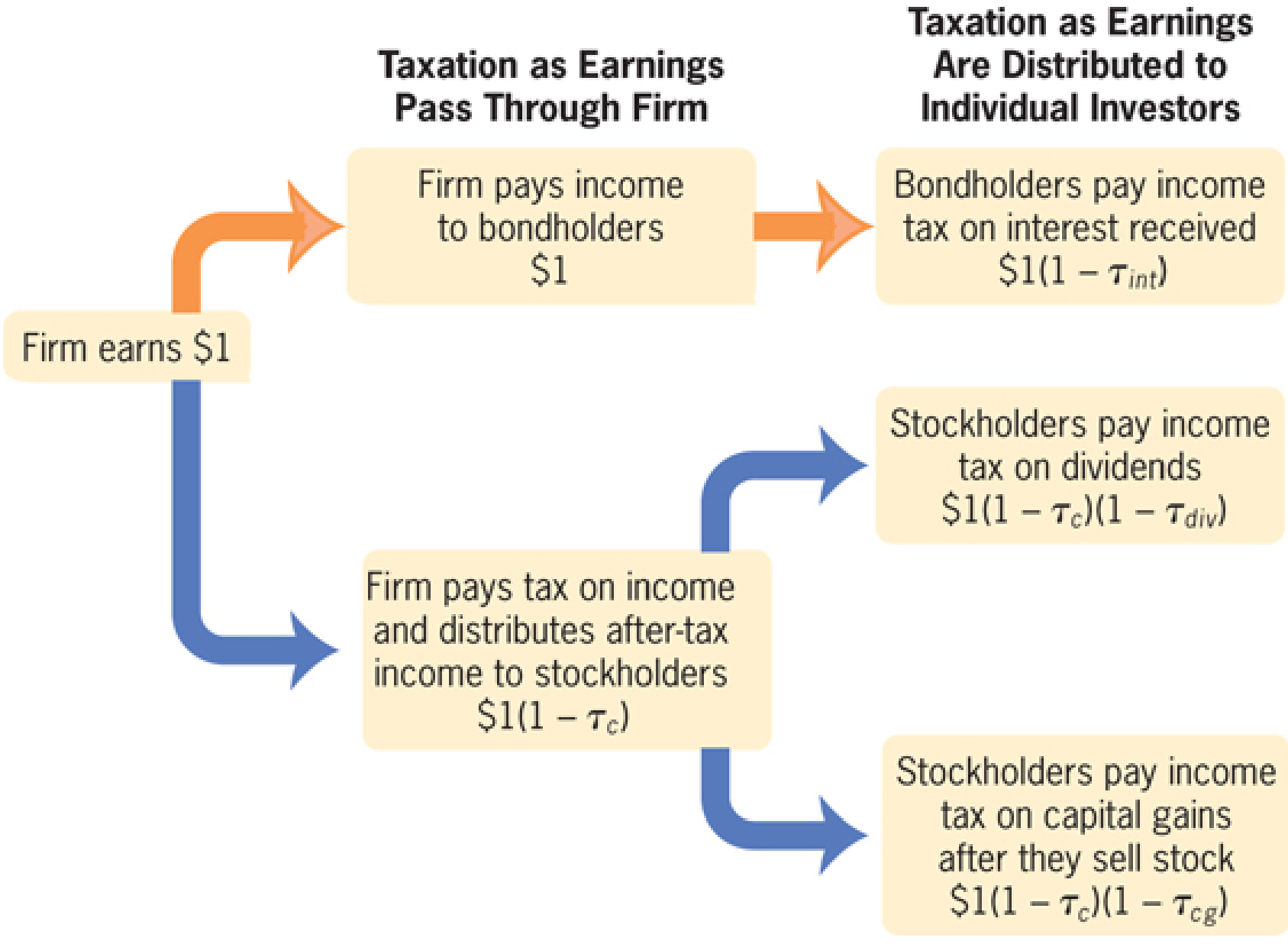
Investment decisions



Investment decisions



Choice of financing



Debt vs equity

- Interest expenses deductible[3], dividends are not: an incentive for debt rather than equity financing. Why aren't firms fully debt-financed?
  - Deductibility overstated: firms have to have positive income to use deductions (they can be carried forward/back though)
  - Cost of debt high due to adverse selection/moral hazard
  - Risk of bankruptcy and financial distress increases with debt
  - Managers' life is easier when bankruptcy is not an issue
  - Intangibles (ideas, "know-how") are equity and need not be debt-financed

[3] limited as of 2018

Dividends

Dividends are subject to taxation, whereas retained and reinvested earnings are not. Additionally, stock repurchases allow shareholders to receive money and choose when to sell and pay taxes.

- Why do firms pay dividends?
  - Signaling financial strength
  - Agency costs: reducing empire building appetite of managers
  - Clientele effects: some taxpayers have low tax rates and dividends may be attractive (eg., tax exempt institutional investors)
  - There are limits on alternative ways of getting money out such as stock repurchases, so divdends are the next best option

Conclusions

- Taxation on savings distorts savings decisions and intertemporal consumption choices
- Capital income tax models can generate positive or zero as optimal long run tax rate
- These models are highly sensitive to time horizon, and intertemporal and risk preferences
- Wealth taxation can yield more money at a lower rate, but has enforcement and measurement issues
- Tax at accrual or at realization changes revenue generation – existing laws in US encourages bequests to avoid taxes
- Corporate income taxation doubles capital income taxation, but has several practical justifications

Appendix

Approach #1: commodity taxation

- Consumption in different periods maps to different goods
- Add labor supply in period 1, no income in period 2:

$$C_1 + \frac{C_2}{1 + r(1 - t)} = wL(1 - t^L)$$

- Tax on capital is a differential tax on consumption between period 1 and 2.
- Violates Ramsey Rule benchmark: if the elasticity of consumption in both periods is the same, then the tax rate should be the same.
- Extensions: taxation over life-cycle; age-dependent taxation

Approach #2: infinite horizon approaches

- Preferences: $\sum_{t=0}^{\infty} \rho^{-t} u(C_t, L_t)$ (Note: t is time not tax)
- ρ is the personal discount rate, i.e. "impatience," a higher ρ means value utility tomorrow less than utility today
- Asset accumulation:
  $A_{t+1} = (1 + r(1 - \tau^K))(A_t + w_t(1 - \tau^L)L_t - C_t)$
- Government needs revenue (G_t) and can borrow
- Production function and capital stock:
  $C_t + G_t + (K_{t+1} - (1 - \delta)K_t) = F(K_t, L_t)$
- Infinite time horizon without shocks means the government commits to a taxation path
- Two "main" options: (1) commodity tax as before, uniform taxation and (2) an incentive to confiscate initial assets (A_0)

Approach #2: infinite horizon approaches

- Chamley (1986) and Judd (1987): optimal capital tax rate in the long run is zero.
- Intuition: uniform tax optimal; positive tax would imply distortions growing without bound
- During shift to no long-run tax, initial taxes on capital are large and come close to "lump sum" taxes without eliminating savings
- Relevant? unrealistic assumptions about government's ability to save, time consistency, recent challenges:
- Werning & Straub (2020) show several conditions for which Chamley-Judd long-run optimal capital tax rate is positive
- Piketty-Saez show that if infinite horizon operates via inheritances, then long-run optimal capital tax rate is positive because ability to pay changes with generosity of bequests

Approach #3 — redistribution

- Consider optimal income tax as before but with multiple consumption goods $u(L, C_1, C_2)$
- Government can tax labor income wL and commodities $T(wL, C_1, C_2, \cdots)$
- Atkinson-Stiglitz (1976) theorem: if preferences can be represented by utility of the form $u(L, v(C_1, C_2))$ then the optimal tax is just $T(wL)$
- Intuition: it is all about information. We want to learn about skills w. Once we observe wL, does observing consumption help? With these preferences, people with the same wL will choose the same consumption even if w is different.
- Relevance for capital tax: just re-interpret goods as consumption in different periods
- Relevance/extensions: benchmark case, preferences can vary with skills (especially: preference for C today vs tomorrow)

Approach #4: uncertainty

- Individuals face risk, insurance valuable.
  Effort e — unobservable, cost of effort $v(e)$, income risk ε, assets A, consumption C, utility $\mathrm{E}[u(C)] - v(e)$
- Without insurance: $C = A + e + \varepsilon$, effort decision:
  $\mathrm{E}[u'(A + e + \varepsilon)] = v'(e)$
- Full consumption insurance — no incentive to work
  $C = \text{constant} = \mathrm{E}[A + e + \varepsilon]$, $\frac{d}{de} u(\mathrm{E}[A + e + \varepsilon]) = 0$
- Trade-off: more insurance, weaker incentive to work
- Assets reduce incentive to work via income effect.
  $\frac{d}{dA} u'(A + e + \varepsilon) = u''(A + e + \varepsilon) < 0$
- Benefit of taxing assets: it strengthens the incentive to work and allows for providing more insurance
- This argument applies to people that need insurance — it ends up being a tax at the low end of the distribution
- Relevance: asset testing in welfare programs

Mini-Game: Does taxing savings change behavior?

Setup (2 volunteers or 2 small groups)

- Give each \$100 in tokens. Next period interest rate: $r = 10\%$.
- **Round A (no tax):** choose how much to consume now vs. save.
- **Round B (tax):** tax on interest income at 50% (so savings grow at $1 + 0.10 \cdot (1 - 0.5) = 1.05$).

Prompt to class

- A: With no tax, how much did you save? What do you consume next period?
- B: With the tax on interest, did you change your saving?

Reveal: a tax on capital income is a tax on *when* you consume

- **Budget slope intuition:** The after-tax intertemporal price of future consumption worsens (from $1/(1.10)$ to $1/(1.05)$).
- **Behavior:** Most savers reduce saving in Round B.
- **Takeaway:** Taxing capital income *tilts* the lifetime budget line:

$$C_1 + \frac{C_2}{1 + r(1-\tau)} = Y_1 + \frac{Y_2}{1 + r(1-\tau)}$$

- **Plain English:** A tax on interest is a tax on *future consumption*.

Mini-Game: Domar–Musgrave in practice

Roles: 1 investor, 1 government, coin (Heads = +50%, Tails = -50%). Invest \$10.

- **Round A (no tax):** Investor alone bears risk.
- **Round B (50% tax with full loss offset):**
  Heads: gov't takes 50% of gain; Tails: gov't refunds 50% of loss.

Write these on the board

- No tax outcomes: \$15 (Heads), \$5 (Tails) $\Rightarrow$ investor risk = $\pm$\$5.
- With tax+offset: \$12.5 (Heads), \$7.5 (Tails) $\Rightarrow$ investor risk = $\pm$\$2.5.

Reveal: Tax can cut risk one-for-one with loss offsets

- **Same expected value**, smaller variance: government shares upside *and* downside.
- **Key condition:** Full loss deductibility (or credible carrybacks/forwards). Without it, tax is asymmetric and discourages risk-taking.
- **One-liner:** With full offsets, a tax makes the government a *silent equity partner*.