Reflections on capital taxation

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Optimal tax theory

• What have we learned since 1970?
• We have made some (limited) progress regarding optimal labor income taxation
• But our understanding of optimal capital tax is close to zero…virtually no useful theory…

→ in this presentation, I will present new results on optimal capital taxation & try to convince you that they are useful

Optimal labor income taxation

• Pre-tax labor income: $y = \theta l$ ($\theta$ = productivity)
• Disposable income: $c = y - T(y)$
• Mirrlees-Diamond-Saez formula:
  \[ \frac{T'}{1-T'} = \frac{1}{e} \frac{[1-F(y)]}{y f(y)} \]
→ this is a useful formula, because it can used to put numbers and to think about real-world tax policy & trade-offs in an informed way (or at least in a more informed way than in the absence of theory...)
  (=minimalist definition of a useful theory)
• (1) If elasticity $e = \text{flat}$, then **marginal tax rates** $T'(y)$ should follow a **U-shaped pattern**: high at bottom & top, but low in the middle, because high pop density; but $e$ might be higher at bottom (extensive participation effects): study of work-credit trade-offs etc.

• (2) **As** $y \to \infty$, $T' \to 1/(1+ae)$ ($a = \text{Pareto coeff}$) ($a=2.5 \to 1.5$ in US since 70s: fatter upper tail)
  
  $\to$ if $a=1.5$ & $e=0.1$, $t'=87\%$; but if $e=0.5$, $t'=57\%$

• **Main limitation**: at the top, $e$ has little to do with labor supply; tax enforcement issues; rent extraction issues; marginal product illusion
Optimal capital taxation

• Standard theory: optimal capital rate $\tau_K = 0\%$... (Chamley-Judd, Atkinson-Stiglitz)
• Fortunately nobody seems to believe in this extreme result: nobody is pushing for the complete supression of corporate tax, inheritance tax, property tax, etc.
• Eurostat 2010: total tax burden EU27 = 39% of GDP, including 9% of GDP in capital taxes
• The fact that we have no useful theory to think about these large existing capital taxes is one of the major failures of modern economics
A Theory of Inheritance Taxation

• Inheritance = 1\textsuperscript{st} key ingredient of a proper theory of optimal capital taxation
• Imperfect K markets = 2\textsuperscript{nd} key ingredient (to go from inheritance tax to lifetime K tax)
• With no inheritance (100\% life-cycle wealth) \textbf{and} perfect K markets, then the case for \( t_K = 0 \% \) is indeed very strong: \( 1+r = \text{relative price of present consumption} \rightarrow \text{do not tax } r \) (Atkinson-Stiglitz: do not distort relative prices, use redistributive labor income taxation only)
• Key parameter: $b_y = B/Y = \text{aggregate annual bequest flow } B/\text{national income } Y$

• Very large historical variations:
  $b_y = 20-25\% \text{ of } Y \text{ until WW1 (}=\text{very large)}$
  $b_y < 5\% \text{ in 1950-1960 (~Modigliani lifecycle story)}$
  $b_y \text{ back up to } \sim 15\% \text{ by 2010}$

• See « On the Long-Run Evolution of Inheritance – France 1820-2050 », Piketty WP’10, forth.QJE’11

• $r > g \text{ story: } g \text{ small & } r >> g \rightarrow \text{inherited wealth capitalizes faster than growth } \rightarrow b_y \text{ high}$
Figure 9: Observed vs simulated inheritance flow B/Y, France 1820-2100
Why Chamley-Judd fails with inheritances?

C-J in the dynastic model implies that inheritance tax rate $\tau_K$ should be zero in the long-run

(1) If social welfare is measured by the discounted utility of first generation then $\tau_K=0$ because inheritance tax creates an infinitely growing distortion but…

this is a crazy social welfare criterion that does not make sense when each period is a generation

(2) If social welfare is measured by long-run steady state utility then $\tau_K=0$ because supply elasticity $e$ of inheritance wrt to price is infinite but…

we want a theory where $e$ is a free parameter
Why Atkinson-Stiglitz fails with inheritances?

A-S applies when sole source of lifetime income is labor: \( c_1 + c_2 / (1 + r) = \theta l - T(\theta l) \)

Inheritances provide an additional source of life-income:
\( c + b(\text{left}) / (1 + r) = \theta l - T(\theta l) + b(\text{received}) \)

conditional on \( \theta l \), high \( b(\text{left}) \) is a signal of high \( b(\text{received}) \) [and hence low \( u_c \)] \( \Rightarrow \) “Commodity” \( b(\text{left}) \) should be taxed even with optimal \( T(\theta l) \)

**Extreme example:** no heterogeneity in \( \theta \) but pure heterogeneity in bequests motives \( \Rightarrow \) bequest taxation is desirable for redistribution

Note: bequests generate positive externality on donors and hence should be taxed less (but still >0)
A Good Theory of Optimal Inheritance Tax

Should follow the optimal labor income tax progress and hence needs to capture key trade-offs robustly:

1) **Welfare effects**: people dislike taxes on bequests they leave, or inheritances they receive, but people also dislike labor taxes → interesting trade-off

2) **Behavioral responses**: taxes on bequests might (a) discourage wealth accumulation, (b) affect labor supply of inheritors (Carnegie effect) or donors

3) Results should be **robust** to heterogeneity in tastes and motives for bequests within the population and formulas should be expressed in terms of estimable “**sufficient statistics**”
Simplified 1-period model

• Agent i in cohort t (1 cohort = 1 period = H years)
• Born at the beginning of period t
• Receives bequest b_{ti} at beginning of period t
• Works during period t
• Receives labor income y_{Lti} at end of period t
• Consumes c_{ti} & leaves bequest b_{t+1i}
• Max U(c_{ti}, b_{t+1i}) = (1-s_{Bi})\log(c_{ti}) + s_{Bi}\log(b_{t+1i})

s.c. c_{ti} + b_{t+1i} \leq y_{Lti} + b_{ti} e^{rH} (H=generation length)

→ b_{t+1i} = s_{Bi} (y_{Lti} + b_{ti} e^{rH})
• Steady-state growth: \( Y_t = K_t^\alpha H_t^{1-\alpha} \), with \( H_t = H_0 e^{gt} \)
and \( g \) = exogenous productivity growth rate

• Assume \( E(s_{Bi} \mid y_{Lti}, b_{ti}) = s_B \) (i.e. preference shocks \( s_{Bi} \) i.i.d. & indep. from \( y_{Lti} \) & \( b_{ti} \) shocks)

• Then the aggregate transition equation takes a simple linear form:

\[
B_{t+1} = s_B \left( Y_{Lt} + B_t e^{rH} \right)
\]

\[
b_y t = B_t / Y_t \rightarrow b_y = s_B (1-\alpha)e^{(r-g)H}/(1-s_B e^{(r-g)H})
\]

• \( b_y \) is an increasing function of \( r-g, \alpha \) & \( s_B \)

• \( r-g=3\%, H=30, \alpha=30\%, s_B=10\% \rightarrow b_y = 23\% \)

• \( b_y \) indep. from tax rates \( \tau_L \) & \( \tau_B \) (elasticity \( e=0 \))
Optimal inheritance tax formulas

- Rawlsian optimum, i.e. from the viewpoint of those who receive zero bequest ($b_{ti}=0$)
- Proposition 1 (pure redistribution, zero revenue)
  Optimal bequest tax: $\tau_B = \frac{[b_y - s_B(1-\alpha)]}{b_y(1+s_B)}$
- If $b_y=20\%$, $\alpha=30\%$, $s_B=10\%$, then $\tau_B = 59\%$
- I.e. bequests are taxed at $\tau_B=59\%$ in order to finance a labor subsidy $\tau_L = \frac{\tau_B b_y}{(1-\alpha)}=17\%$
- Zero receivers do not want to tax bequests at 100\%, because they themselves want to leave bequests → trade-off between taxing successors from my cohort vs my own children
• Proposition 2 (exo. revenue requirements $\tau_Y$)
  $\tau_B = [b_y - s_B(1-\alpha-\tau)]/b_y(1+s_B)$, $\tau_L = (\tau - \tau_B b_y)/(1-\alpha)$

• If $\tau=30\%$ & $b_y=20\%$, then $\tau_B=73\%$ & $\tau_L=22\%$
• If $\tau=30\%$ & $b_y=10\%$, then $\tau_B=55\%$ & $\tau_L=35\%$
• If $\tau=30\%$ & $b_y=5\%$, then $\tau_B=18\%$ & $\tau_L=42\%$

→ with high bequest flow $b_y$, zero receivers want to tax inherited wealth at a higher rate than labor income (73% vs 22%); with low bequest flow they want the opposite (18% vs 42%)
• The level of the bequest flow $b_y$ matters a lot for the level of the optimal bequest tax $\tau_B$
• Intuition: with low $b_y$ (high $g$), not much to gain from taxing bequests, and this is bad for my children; i.e. with high $g$ what matters is the future, not the rentiers of the past
• but with high $b_y$ (low $g$), it’s the opposite: it’s worth taxing bequests & rentiers, so as to reduce labor taxation and to allow people with zero inheritance to leave a bequest...
• Proposition 3 (any utility function, elasticity e>0)

\[ \tau_B = \frac{b_y - s_{B0} (1 - \alpha - \tau)}{b_y (1 + e + s_{B0})} \]

With \( s_{B0} = \) aver. eff. saving rate of zero receivers

e = \) elasticity of bequest flow \( b_y \) wrt \( 1 - \tau_B \)

• If \( b_y = 10\% \), \( s_{B0} = 10\% \), and \( e = 0 \) then \( \tau_B = 55\% \) & \( \tau_L = 35\% \)
• If \( e = 0.2 \), then \( \tau_B = 46\% \) & \( \tau_L = 36\% \)
• If \( e = 0.5 \), then \( \tau_B = 37.5\% \) & \( \tau_L = 37.5\% \)
• Behavioral responses matter but not hugely as long as elasticity is reasonable
• Note that if \( s_{B0} = 0 \) (zero receivers never want to leave bequests), we obtain \( \tau_B = 1/(1 + e) \), the classical revenue maximizing inverse elasticity rule
From inheritance tax to capital tax

- With perfect K markets, it’s always better to have a big tax $\tau_B$ on bequest, and zero lifetime tax $\tau_K$ on K stock or K income, so as to avoid intertemporal distorsion.
- However in the real world most people prefer paying a property tax $\tau_K=1\%$ during 30 years rather than a big bequest tax $\tau_B=30\%$.
- Total K taxes = 9% GDP, but bequest tax <1%.
- In our view, the collective choice in favour of lifetime K taxes is a rational consequence of K markets imperfections, not of tax illusion.
• Other reason for lifetime K taxes: fuzzy frontier between capital income and labor income, can be manipulated by taxpayers

• Proposition 4: With fuzzy frontier, then $\tau_K = \tau_L$ (capital income tax rate = labor income tax rate), and bequest tax $\tau_B > 0$ iff bequest flow $b_y$ sufficiently large

$\rightarrow$ comprehensive income tax + bequest tax = what we observe in many countries

(= what Mirrlees Review proposes; except for « normal rate » exemption $\rightarrow$ this would require an even larger bequest tax rate $\tau_B$)
• Pb: in real world, K-labor frontier not entirely fuzzy; see property tax example → one needs K market imperfections to explain obs. tax preferences

• Two kinds of K market imperfections:
  (1) Liquidity pbs: paying $\tau_B = 30\%$ might require successors to sell the property (borrowing constraints + indivisibility pb)

→ empirically, this seems to be an important reason why people dislike inheritance taxes (« death taxes ») much more than property taxes & other lifetime K taxes
(2) Uninsurable uncertainty about future rate of return on inherited wealth: what matters is $b_{ti} e^{rH}$, not $b_{ti}$; but at the time of setting the bequest tax rate $\tau_B$, nobody has any idea about the future rate of return during the next 30 years... (idyosincratic + aggregate uncertainty)

→ with uninsurable uncertainty on $r$, it’s more efficient to split the tax burden between one-off transfer taxes and flow capital taxes paid during entire lifetime
• In case the intertemporal elasticity of substitution is small, and liquidity pb and/or uninsurable uncertainty on future r is substantial, then maybe it’s not too surprising to find that lifetime capital taxes dominate one-off transfer taxes in the real world
• Proposition 5. Depending on parameters, optimal capital income tax rate $\tau_K$ can be $>$ or $<$ than labor income tax rate $\tau_L$; if IES $\sigma$ small enough and/or by $b_y$ large enough, then $\tau_K > \tau_L$ (=what we observe in UK & US until the 1970s)

• True optimum: K tax exemption for self-made wealth (savings accounts); but this requires complex individual wealth accounts

• Progressive consumption tax cannot implement rawlsian optimum (bc labor & inheritance treated similarly by $\tau_C$)

(Kaldor 1955: progressive $\tau_C$ + bequest tax $\tau_B$)
Conclusion

• Main contribution: simple, tractable formulas for analyzing optimal tax rates on inheritance and capital

• Main idea: economists’ emphasis on \(1+r=\)relative price & second-order intertemporal distortions is excessive

• The important point about \(r\) is that it’s large (\(r>g \rightarrow\) tax inheritance, otherwise society is dominated by rentiers), volatile and unpredictable (\(\rightarrow\) use lifetime \(K\) taxes to implement optimal inheritance tax)