Optimal Capital Taxation Under Stochastic Returns To Savings

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Structure

1 Motivation

2 The Model

3 Conclusion
Motivation I: Zero capital tax benchmark
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- In developed economies, governments usually levy taxes on capital.
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- Yet providing a clear theoretical justification for taxing capital can be challenging.
Motivation I: Zero capital tax benchmark

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- Yet providing a clear theoretical justification for taxing capital can be challenging.

- In particular using the influential optimal tax framework provided by Atkinson and Stiglitz (1976) one can prove that labor income taxation is sufficient to maximize welfare: zero capital tax benchmark.
Motivation II: Stochastic Returns To Savings

Standard optimal taxation model: agents access a unique, deterministic, rate of return to savings.⇒ convenient assumption⇒ but recently challenged by:
Direct empirical evidence of heterogeneous and volatile returns in household finance (Bach et al. (2020), Fagereng et al. (2020))
Indirect evidence: stochastic returns are needed to replicate observed wealth dynamics using life cycle models (Gabaix et al. (2016), Benhabib and Bisin (2018))⇒ returns are likely to be stochastic and this could matter for optimal capital taxation.
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Motivation III: Wealth correlated returns or "Scale dependence"

The rate of return is likely to be correlated with the amount invested: conjectured by Arrow (1987), Piketty (2013), empirically documented by both Bach et al. (2020) and Fagereng et al. (2020). Such scale dependence can give rise to a "rich get richer" effect, which could provide an equity rationale for taxing capital. But what about efficiency?
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2. In particular: do these stochastic, scale dependent returns, rather advocate for capital income or wealth taxation?
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Two recent optimal tax approach depart from the homogeneous rate of return assumption:

- Broadway and Spiritus (2021) : Capital taxation and return uncertainty but no scale dependence.
- Gerritsen et al. (2020) Capital taxation and scale dependence but no uncertainty.
- Study the interaction between these two features of returns to savings : this paper.
Structure

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3. Conclusion
The Economy

Two periods, no overlap.

A continuum of agents work, consume and save in the first-period. All savings are then used for second-period consumption.

At the beginning of the first-period, each individual randomly draw a labor productivity parameter $\theta$. (Mirrlees (1971))

At the beginning of the second-period, each individual draw a rate of return on savings $r$.

The draw of $r$ can depend on savings $s$ (scale dependence).
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Individuals with productivity $\theta$ choose labor income $y$ and savings $s$ to solve:

$$U(\theta) \equiv \max_{y,s} u(y-s) + E[\nu((1+r)s-t(s,rs)-T(y))] - h(y,\theta)$$

with:

$u(.)$, $\nu(.)$ measuring utility from first and second period consumption and $h(.)$ disutility from work effort.

$T(y)$ the labor income tax schedule.

$t(s,rs)$ the capital tax schedule, based on savings $s$ and capital income $rs$. 
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$$U(\theta) \overset{\text{def}}{=} \max_{y,s} \left[ u(y - s) + \mathbb{E} \left[ v \left( (1 + r) s - t(s, rs) - T(y) \right) \right] | s \right] - h(y, \theta)$$

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- $u(.)$, $v(.)$ measuring utility from first and second period consumption and $h(.)$ disutility from work effort.
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- $t(s, rs)$ the capital tax schedule, based on savings $s$ and capital income $rs$. 
The Government

The government levies taxes to finance an exogenous amount of public good $E$. For simplicity, I assume that both labor income tax $T(y)$ and capital tax $t(s, rs)$ are levied at the same time.  

Government budget constraint:  

$$Z_{\theta} \in \Theta \quad h \quad T(y(\theta)) + E[t(s(\theta), rs(\theta))] \quad i \quad dG(\theta) \geq E(1)$$
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$$\int_{\theta \in \Theta} \left[ T(y(\theta)) + \mathbb{E}[t(s(\theta), rs(\theta)) | s(\theta)] \right] dG(\theta) \geq E \quad (1)$$
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- **Objective**: find the optimal capital tax schedule $t^*(.)$ without solving for the optimal labor income tax function $T^*(.)$.
- **Method**: study capital tax reforms that do not affect taxpayers utility but only government revenue.
- **Optimal capital tax $t^*(.)$**: generates more government revenue than any other capital tax without changing individual utility.
Optimal Capital Tax when both Savings and Capital Income are observed

Proposition 1

As long as the government observes both savings and capital income, the optimal capital tax is given by:

\[ t^* (s, r_s) = r_s - \bar{r}(s) s, \forall (s, r_s) \]

with \( r(s) \) the average rate of return, conditional on savings \( s \).

Second-period consumption does no longer depend on the draw of \( r \):

\[ c_2 = (1 + \bar{r}(s)) s \Rightarrow \text{full insurance against stochastic returns without distorting savings.} \]

\[ \Rightarrow \text{redistribution only between agents with the same amount of initial savings} \]
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Now suppose that the government does not observe savings but has only information on capital income. ⇒ Impossible to know if a high capital income is due to high savings (effort) or to a high rate of return (luck) ⇒ trade-off between insuring and preserving incentives to save.

Proposition 2
In a constrained environment where only capital income is observed, the optimum features a strictly positive tax on capital income: 

$$t^* (r_s) > 0$$
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Optimal Capital Tax When Only The Market Value of Wealth is Observed

I call $(1 + r)s$, i.e. wealth evaluated ex post, the market value of wealth. Suppose that the only form of capital observed by the government is the market value of wealth.

Proposition 3
In a constrained environment where only the market value of wealth is observed, the optimum does feature strictly positive capital taxation:

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In a constrained environment where only initial savings is observed, there is no capital taxation at the optimum \( t^* (s) = 0 \). A tax on \( s \) does not provide any form of insurance. Equity? \( \Rightarrow \) Non-linear labor income taxation is sufficient to fulfill whatever redistributive objective the government pursues \( \Rightarrow \) the logic of Atkinson and Stiglitz (1976) applies.
Optimal Capital Tax When Only Initial Savings Is Observed

In my framework, savings $s$ can be seen as the *book value* of wealth.
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1. Stochastic returns provide an insurance rationale for taxing capital.
2. The correlation between rates of return and savings has to be taken into account when designing the optimal policy.
3. But scale dependence does not provide a strong rationale for redistributive capital taxes: redistribution within groups of savers in the unconstrained setting. No capital tax when only initial savings are observed by the government.
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   - redistribution **within** groups of savers in the unconstrained setting.
   - no capital tax when only initial savings are observed by the government.
End

Thanks for your attention!


