Lecture 5: Wealth & property taxes over time & across countries
(check online for updated versions)
Roadmap of lecture 5

- Basic notions & notations
- Reminder: what is capital?
- Key distinction: taxes on flow vs taxes on stock
- Inheritance taxes
- Progressive wealth taxes
- Property taxes
Basic notions & notations

• National income \( Y = F(K,L) = Y_K + Y_L = rK + vL \)
  
  with \( r = \) average rate of return
  \( v = \) average wage rate

• Individual income \( y_i = y_{Ki} + y_{Li} = r_i k_i + v_i l_i \)
  
  with \( r_i = \) individual rate of return, \( v_i = \) individual wage rate

• Individual capital (wealth) \( k_i \) comes from past savings and/or from inheritance (or sometime from various forms of appropriations or privatization processes, e.g. for natural ressources: land, oil, gold, etc.)

• In order to study capital taxation, one needs to specify where \( k_i \) comes from, i.e. one needs a dynamic, multi-period model: static, one-period model are fine to study labor income taxation, but cannot be used to study capital taxation → see next lecture for explicit dynamic models; today = mostly a description of existing capital taxes
Reminder: what is capital?

- $K = \text{real-estate (housing, offices..), machinery, equipment, patents, immaterial capital,..}$
  $(\approx \text{housing assets + business assets: about 50-50})$
  $Y_K = \text{capital income = rent, dividend, interest, profits,..}$

- In rich countries, $\beta = K/Y = 5-6$ (see economic history course for more details)
  $(\alpha = Y_K/Y = 25-30\%)$
  $(\text{i.e. average rate of return } r = \alpha/\beta = 4-5\%)$

- Typically, in France, Germany, UK, Italy, US, Japan:
  $Y \approx 30\,000\text{€ (pretax average income, i.e. national income /population), } K \approx 150\,000-180\,000\text{€ (average wealth, i.e. capital stock/population); net foreign asset positions small in most countries (but rising);}$
  see \textit{economic history course} for more details
Figure 3.1. Capital in the United Kingdom, 1700-2010

National capital is worth about 7 years of national income in the United Kingdom in 1700 (including 4 in agricultural land). Sources and series: piketty.pse.ens.fr/capital21c.
In Italy, private capital rose from 240% to 680% of national income between 1970 and 2010, while public capital dropped from 20% to -70%. Sources and series: piketty.pse.ens.fr/capital21c.
Figure 5.7. National capital in rich countries, 1970-2010

Net foreign assets held by Japan and Germany are worth between 0.5 and 1 year of national income in 2010.

Sources and series: see piketty.pse.ens.fr/capital21c.
Key distinction: taxes on flows versus stock

- Total tax burden EU27 ≈ 39% of GDP, incl. 9% in capital taxes (US: 28%, incl. 8% in capital taxes). See Eurostat 2013
- With a capital share $\alpha = \frac{Y_k}{Y} \approx 30\%$, this is equivalent to an average tax rate $\approx 30\%$ on all capital income flows
- With a capital/income ratio $\beta = \frac{K}{Y} \approx 600\%$, this is equivalent to an average tax rate $\approx 1.5\%$ on the capital stock
→ both forms of capital taxes raise $\approx 9\%$ of GDP

- In practice, there is a large diversity of capital taxes: **stock-based** (one-off inheritance and transfer taxes, annual property or wealth taxes) or **flow-based** (corporate income taxes, taxes on capital income: rental income, interest, dividend, $k$ gains etc.); why are they not all equivalent?
• In the simplest economic models, we have a general equivalence result: if the rate of return on capital is equal to \( r \) and is the same across all individuals & over all assets (=perfect capital markets), then a tax at rate \( t_k \) on the capital income flow is exactly equivalent to a tax at rate \( \tau_k \) on the capital stock, with:

\[
\tau_k = r \times t_k, \text{ or } t_k = \frac{\tau_k}{r}
\]

• If \( r=5\% \), it is equivalent to tax capital stock at \( \tau_k=1\% \) per year or to tax capital income flow at \( t_k=20\% \) per year

• If \( r=4\% \), then \( \tau_k=1\% \) on stock \( \leftrightarrow \) \( t_k=25\% \) on income flow
• Exemple: assume that you own an appartement worth $k=1$ million €, and that its annual rental value is equal to $y_k=40\,000€$, i.e. $r = 4\%$

• Assume you have to pay a property tax (taxe foncière) at a rate $\tau_k=1\%$: $1\%$ of $k=10\,000€$ in tax

• It is equivalent to pay a tax at rate $t_k=25\%$ on the rental income (real or imputed):
  \[
  25\% \text{ of } y_k=40\,000€ = 10\,000€ \text{ in tax}
  \]

• Same computations with $k=100\,000€$, $y_k=4\,000€$

• Note: in France, average rate of property tax $\approx 0,5\%$; in the US or UK, it is closer to $\approx 1\%$
In practice, the key reason why taxes on the capital stock and taxes on the capital income flow are not equivalent is the existence of capital market imperfections: the rate of return $r_i$ varies across assets & individuals.

For individuals with $r_i >$ average $r$, then it is better to have stock taxes than flow taxes (& conversely for individuals with $r_i <$ average $r$).

- If $r_i=10\%$, $\tau_k=1\%$ on stock $\leftrightarrow$ $t_k=10\%$ on income flow
- If if $r_i=2\%$, $\tau_k=1\%$ on stock $\leftrightarrow$ $t_k=50\%$ on income flow

Key argument in favor of taxes on capital stock rather than on flow (i.e. capital tax rather than income tax): they put incentives to get a high return on $k$ (Allais) (see also Guvenen et al 2016)
• In the EU & US, capital taxes = 8%-9% GDP
• Typical structure:
  • inheritance taxes <1% GDP
    (say, 5%-10% of a 10% tax base)
  • + annual wealth & property taxes 1%-2% GDP
    (say, 0.5% of a 200%-400% tax base)
  • + corporate profits tax 2%-3% GDP
    (say, 20%-30% of a 10% tax base)
  • + personal capital income tax 2%-3% GDP
    (say, 20%-30% of a 10% tax base)
Exemple of inheritance taxes

• Basic distinction:

• **Estate taxes**: tax rates depend on the total “estate” (real estate: immobilier + personal estate: mobilier, incl. financial), i.e. the total wealth left by the decedent, irrespective of how it is split between successors
  
  = **applied in US & UK** (complete testamentary freedom... but egalitarian default rules if no testament)

• **Inheritance taxes**: tax rates depend on the wealth received by each successor (part successorale) and the kin relationship (children vs stangers)

  = **applied in France & Germany** (limited testamentary freedom; rigid transmission rules)

→ in order to understand how the tax is computed, one first needs to understand how the wealth is divided
• Rigid transmission rules in France: the 1/n+1 rule
• « Réserve héréditaire » (this has to go to the children, no matters what) = n/n+1
• « Quotité disponible » (what you can transmit to individuals other than your children) = 1/n+1, with n = number of children
• With n = 1, free disposal of 50% of your wealth
• With n = 2, free disposal of 33% of your wealth
• With n = 3 or more, free disposal of 25% of your wealth; the other 75% is divided equally among children
• These basic rules were unchanged since 1804
• Default matrimonial regime: « community of acquisition » (« communauté réduite aux acquêts »)
• Married couple wealth $w = w_c + w_1 + w_2$
• with $w_c =$ community assets = assets acquired during marriage
  
  $w_1, w_2 =$ own assets (biens propres) = inherited by each spouse (or acquired before marriage)
• Only $w_c$ is split 50-50

• Other matrimonial regimes: separate property (more & more common); universal community (very rare)
• Inheritance data can be used to study family strategies with wealth, porfolio reallocation during marriage, etc.
Figure 4: Portfolio reallocations during marriage

- Share of uncappedilized inherited assets (currently owned + sold or given during marriage) in total assets
- Share of uncappedilized inherited assets (currently owned only) in total assets
### Marginal vs average tax rates: illustration with French 2012-2013 Inheritance Tax

<table>
<thead>
<tr>
<th>Inheritance brackets (in excess of exemption)</th>
<th>Marginal tax rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (€)</td>
<td>5,0%</td>
</tr>
<tr>
<td>8 072</td>
<td>10,0%</td>
</tr>
<tr>
<td>12 109</td>
<td>15,0%</td>
</tr>
<tr>
<td>15 932</td>
<td>20,0%</td>
</tr>
<tr>
<td>552 324</td>
<td>30,0%</td>
</tr>
<tr>
<td>902 838</td>
<td>40,0%</td>
</tr>
<tr>
<td>1 805 677</td>
<td>45,0%</td>
</tr>
</tbody>
</table>

**French 2012-2013 tax schedule (applied to 2012-2013 decedents):** *(barème des droits de successions)*

**(see www.impots.gouv.fr)**

- This tax schedule applies "in direct line", i.e. for transmissions from parents to children, on individual estate shares ("parts successorales")
- **The exemption for children is equal to:** 100 000 €
- **Inter vivos gift:** exemption every 15 year
- Spouses: tax exempt
- **Note:** until 2011, top rate = 40% instead of 45%
- **Key change in 2012:** in 2007-2011, children exemption = 150 000€, every 6 year
- I.e. if they start giving to their children at age 50 and die at age 80, each parent could transmit 6 x 150 000€ = 900 000€ to each children with zero tax; i.e. a couple with two children could transmit 3,6 millions € with zero tax.
- Since 2012, such parents can "only" transmit 4 x (3 x 100 000€) = 1,2 millions € with zero tax.
- In practice, less than 5% of direct line transmissions pay inheritance taxes (but this depends a lot on tax planning)

_(in 1992-2006: children exemption = 50 000€, every 10 year)_
**Exemple 1: married couple with wealth \( w = 1 \text{ million } \€ \) and two kids, no inter vivos gift**

Assumption: each spouse owns 500 000€, and the couple wishes to transmit 500 000€ to each kid

Assume that the first decedent transmits the full property of 500 000€ to kids; then the second decedent transmits the remaining 500 000€ to the kids

Inheritance tax at first death: 
\[
5\% \times (8072-0) + 10\% \times (12109-8072) + 15\% \times (15932-12109) + 20\% \times (250000 - 15932 - 100000) \\
= 28194 \€ = 11,3\% \text{ of } 250000\€ 
\]

Estate tax at second death = same computation = 28194 \€ = 11,3\% \text{ of } 250000\€

Total estate tax paid by each children = 56389 \€ = 11,3\% \text{ of } 500000\€

**Total inheritance tax paid = 112777 \€ = 11,3\% \text{ of } 1000000\€**

Effective tax rate = 11,3\%  < Marginal tax rate=20%

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**Exemple 2: married couple with wealth \( w = 10 \text{ million } \€ \) and two kids, no inter vivos gift**

Assumption: each spouse owns 5 millions €, and the couple wishes to transmit 5 millions € to each kid

Assume that the first decedent transmits the full property of 5 millions € to kids; then the second decedent transmits the remaining 5 millions € to the kids

Inheritance tax at first death: 
\[
5\% \times (8072-0) + 10\% \times (12109-8072) + 15\% \times (15932-12109) + 20\% \times (552324 - 15932) \\
+ 30\% \times (902838 - 552324) + 40\% \times (1805677 - 902838) + 45\% \times (2500000 - 1805677 - 100000) \\
= 842394 \€ = 33,7\% \text{ of } 2500000\€ 
\]

Estate tax at second death = same computation = 842394 \€ = 33,7\% \text{ of } 2500000\€

Total inheritance tax paid by each children = 1684789 \€ = 33,7\% \text{ of } 5000000\€

**Total inheritance tax paid = 3369577 \€ = 33,7\% \text{ of } 10000000\€**

Effective tax rate = 33,7\%  < Marginal tax rate = 45%
• Other exemples of computations using tax schedules from France and the US: see excel file

• Chaotic evolution of top inheritance tax rates over time and across countries: see graph

• On the historical evolution of inheritance taxes:
  • See also: J. Beckert, Inherited wealth, PUP 2008

Fisher, « Economists in Public Service », AER 1919

The top marginal tax rate of the inheritance tax (applying to the highest inheritances) in the U.S. dropped from 70% in 1980 to 35% in 2013. Sources and series: see piketty.pse.ens.fr/capital21c.
Progressive wealth taxes

• Exemple with French ISF: see [excel file]
• On the evolution of the French wealth tax (ISF):
• See also G. Du Rietz, M. Henrekson, « Swedish Wealth Taxation (1911–2007) », in Swedish Taxation: Developments since 1862, Palgrave 2015, Chap. 6
Marginal vs average tax rates: illustration with French 2008-11 Wealth Tax

French 2008 wealth tax schedule (applied to 1/1/2008 wealth): threshold marg. rate
(\textit{barème de l’impôt sur la fortune (ISF)})

<table>
<thead>
<tr>
<th>Threshold (€)</th>
<th>Marginal Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>770 000</td>
<td>0,55%</td>
</tr>
<tr>
<td>1 240 000</td>
<td>0,75%</td>
</tr>
<tr>
<td>2 450 000</td>
<td>1,00%</td>
</tr>
<tr>
<td>3 850 000</td>
<td>1,30%</td>
</tr>
<tr>
<td>7 360 000</td>
<td>1,65%</td>
</tr>
<tr>
<td>16 020 000</td>
<td>1,80%</td>
</tr>
</tbody>
</table>

(no major reform in 2008-2011, except small adjustment for inflation)

\textbf{Exemple with wealth } w = 1 \text{ million €}

\[0,55\% \times (1 000 000 - 770 000) = 1 265€ = 0,13\% \text{ of } 1 000 000 €\]

\textbf{>>> marginal wealth tax rate = 0,55\%, average wealth tax rate = 0,13\%}

Implicit wealth income tax rate:
If \( r = 2\% \), i.e. \( rw = 20 000€ \), then average wealth income tax rate = 6,32\%
If \( r = 10\% \), i.e. \( rw = 100 000€ \), then average wealth income tax rate = 1,26\%

\textbf{Exemple with wealth } w = 10 \text{ million €}

\[0,55\% \times (1 240 000 - 770 000) + 0,75\% \times (2 450 000 - 1 240 000) + 1\% \times (3 850 000 - 2 450 000)\]
\[+ 1,30\% \times (7 360 000 - 3 850 000) + 1,65\% \times (10 000 000 - 7 360 000) = 114 850€ = 1,15\% \text{ of } 10 000 000 €\]

\textbf{>>> marginal wealth tax rate = 1,65\%, average wealth tax rate = 1,15\%}

Implicit wealth income tax rate:
If \( r = 2\% \), i.e. \( rw = 200 000€ \), then average wealth income tax rate = 57,43\%
If \( r = 5\% \), i.e. \( rw = 500 000€ \), then average wealth income tax rate = 22,96\%
If \( r = 10\% \), i.e. \( rw = 1 000 000€ \), then average wealth income tax rate = 11,48\%
### Marginal vs average tax rates: illustration with French 2012 Wealth Tax

French 2013 wealth tax schedule (applied to 1/1/2013 wealth):  

<table>
<thead>
<tr>
<th>Threshold (€)</th>
<th>Marg. Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800,000</td>
<td>0.50%</td>
</tr>
<tr>
<td>1,310,000</td>
<td>0.70%</td>
</tr>
<tr>
<td>2,570,000</td>
<td>1.00%</td>
</tr>
<tr>
<td>5,000,000</td>
<td>1.25%</td>
</tr>
<tr>
<td>10,000,000</td>
<td>1.50%</td>
</tr>
</tbody>
</table>

*(barème de l’impôt sur la fortune (ISF)) (see www.impots.gouv.fr)*
Wealth taxes vs property taxes

- Progressive taxes on net wealth (real estate + business + financial assets – debt) exist in Switzerland, France, Spain. They used to exist in Sweden and Germany (abolished during 2000s, mostly because of valuation problems)
- Most common wealth tax: « property tax » = proportional tax on real estate assets
- UK « mansion tax »: progressive tax on real estate transactions (higher rate above 1m£ or 2m£)