Behavioral responses to inheritance tax: Evidence from notches in France

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Motivation

Wealth is strongly concentrated
Wealth can be transmitted from generation to generation

Estate tax : Trade-off between equity and efficiency

Equity :

- Limit the perpetuation of inequality
- Limit corporate power on the political process

Efficiency cost due to behavioral responses :

- Real responses harmful to the macroeconomic success of an economy (incentives for entrepreneurship, savings, labor supply)
- Shifting responses reduce efficiency of taxation to curb wealth inequality

Why do behavioral responses matter ?

- Behavioral responses...
  - Increase the efficiency cost of taxation
  - Limit the redistributive ability of governments

- Nature of behavioral responses yields different policy implications : Saez et al. (2012)
  - Real responses limit optimal top tax rate
  - Shifting responses are a symptom of a poorly design tax system

- Very scarce empirical research on the effect of inheritance taxation on wealth accumulation
  - Kopczuk (2012), Holtz-Eakin and Marples (2001), Kopczuk and Slemrod (2000), Joulfaian (2006)
  - Lack of good micro data
  - Issue about how to identify the causal effect of taxation on wealth accumulation

This paper

- **Research Question :**
  Estimation and implications of behavioral responses to inheritance tax
- Use the Preferential Tax Scheme for life insurance in France
  - Generate large discontinuities in tax liability depending on :
    - Life insurance policy start date (before and after November 20, 1991)
    - Age at which the premiums was paid (before or after 70 years old)
- Estimate different behavioral responses to estate taxation over time
  - Timing responses using bunching estimation
  - Aggregate of real and shifting responses using diff-in-diff method

The Preferential tax scheme for life insurance

- Introduced in 1965 ; entirely exempt life insurance from inheritance tax
- Reform of 1992 not retroactive
  - For life insurance policy taken out after 11/20/1991 :
    recall life insurance premiums paid after age 70 in the inheritance tax base
- Reform of 1998
  - All life insurance premiums not recalled in the inheritance tax base are taxed at a flat rate of 20% after an exemption of 152,500 € by inheritor
- Generate large discontinuities in tax liability depending on :
  - Life insurance policy start date (before and after November 20, 1991)
  - Age at which the premiums was paid (before or after 70 years old)

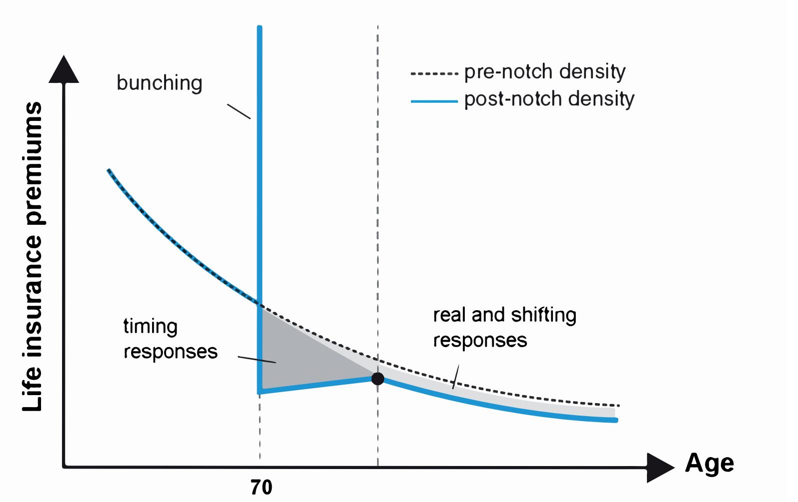
The Preferential tax scheme for life insurance

TABLE 1: Life insurance taxation at death since 1998

	Insurance premiums paid	
	Before aged 70	After aged 70
Life insurance taken out		
Before 11/20/1991	Flat tax rate of 20%	
After 11/20/1991	Flat tax rate of 20%	Recalled into the inheritance tax base

Note : Top inheritance tax rate goes up to 40% for spouses and direct descendants and 60% for collateral heirs.

FIGURE 1: Behavioral responses to the reform of the preferential tax scheme



- Reform of the preferential tax scheme should induce :
  - Re-timing responses at age 70
  - Shifting among asset portfolio
  - Wealth dis-accumulation

- Source of variations and estimation methods :
  - Bunching estimation for timing responses
    - Difference in taxation at age 70
      (*for life insurance policies taken out after 11/20/1991*)
  - Diff-in-diff estimation for aggregate real and shifting responses
    - Comparison of life insurance premiums paid before or after age 70 for life insurance policy taken out before or after 11/20/1991

Contributions :

1. Estimate different behavioral responses to estate taxation over time
   - Timing responses in short and medium run :
     - Important short-term timing responses reflect moderate inter-temporal shifting in the medium term
   - Aggregate elasticity of real and shifting responses
     - Medium-term elasticity = 0.35
     - Long-term elasticity = 0.24
2. Implications on wealth accumulation and bequest motives :
   - Evidence that individuals fail to plan for the disposition of an estate well in advance
   - Evidence of “Wealth loving” motive
3. Develop an inter-temporal model of transfer taxation to rationalize findings 1 to 2
4. Derive Optimal inheritance tax rate from estimated elasticity

Outline

TABLE 2: Life insurance and wealth in France, 1984-2013

Year	Private Wealth (in % of national income)	Wealth composition (in % of private wealth)				Life ins. assets (in % of financial assets)
		Tangible assets	Liabilities	Financial assets	inc. life insurance assets	
1985	304%	74%	-9%	35%	3%	*8%*
1995	330%	67%	-14%	47%	10%	*21%*
2005	466%	70%	-11%	41%	14%	*34%*
2013	597%	73%	-13%	40%	15%	*38%*

Sources : National Accounts from INSEE (France's National Institute of Statistics)

TABLE 3: Life insurance transmitted at death,1984-2006

Year	Wealth at death			Wealth of the living		
	(1) Bequest flow	(2) Life insurance	(3) Life insurance (in % of (1))	(4) Private wealth	(5) Life insurance	(6) Life insurance (in % of (4))
1984	33,1	3,4	10%	3 512	94	3%
1987	35,4	4,5	13%	3 859	136	4%
1994	43,2	7,4	17%	4 584	386	8%
2000	59,2	12,5	21%	5 782	835	14%
2006	86,2	20,2	23%	8 962	1 198	13%

Sources : FFSA (French life insurance association), MTG surveys from DGFiP and National Accounts from INSEE.
All the aggregate flows are in billion 2013 euros.

Data

- French longitudinal data set from Axa (2003-2013)
  - Detailed information about life insurance policy
- Two types of insured
  - Insured taken out a standard life insurance policy (classical insured)
  - Wealthy insured that entrust Axa the management of their wealth (wealthy insured)

Data

- Three motives for life insurance
  1. Cash reserve
  2. Supplemental retirement benefit
  3. Transmission at death
     - Only 3 is affected by the preferential scheme
- Conditions of inclusion in the data set
  - Aged between 60 and 80 years old
  - Having not terminated the life policy during lifetime
- Huge database :
  350 000 individuals $\times$ 23 quarterly years = 8 millions of observations

Bunching sample Diff and diff sample

Outline

- Reform of the preferential tax scheme should induce :
  - **Re-timing responses at age 70**
  - Shifting among asset portfolio
  - Wealth dis-accumulation

- Source of variations and estimation methods :
  - **Bunching estimation for timing responses**
    - Difference in taxation at age 70
      (*for life insurance policies taken out after 11/20/1991*)
  - Diff-in-diff estimation for aggregate real and shifting responses
    - Comparison of life insurance premiums paid before or after age 70 for life insurance policy taken out before or after 11/20/1991

The Preferential tax scheme for life insurance

TABLE 4: Life insurance taxation at death since 1998

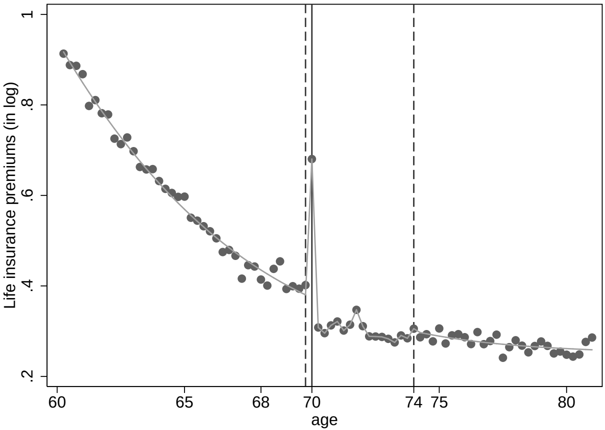
	Insurance premiums paid	
	Before aged 70	After aged 70
Life insurance taken out		
Before 11/20/1991	Flat tax rate of 20%	
After 11/20/1991	Flat tax rate of 20%	Recalled into the inheritance tax base

Note : Top inheritance tax rate goes up to 40% for spouses and direct descendants and 60% for collateral heirs.

- Timing responses using bunching estimation
  - Increase in taxation at age 70
  - Formation of a notch around age 70
  - Identification assumption :
    Distribution of life insurance premiums would have been smooth if there were no jump in the tax rate at age 70

    $\Rightarrow$ No other factors can explain bunching at age 70

FIGURE 2: Life insurance premiums around the notch, (France 2003-2013)



Sample : Life insurance with portfolio manager
(taken out after 11/20/1991)

Estimating the empirical distribution

- Fit a flexible polynomial to the empirical distribution, excluding data in a range around the notch

$$\log y_a = \sum_{j=0}^{J} \beta_j \cdot (age_a)^j + \sum_{k=a_l}^{a_u} \gamma_k \cdot \mathbb{1}_{age_a=k} + \varepsilon_a$$

where $\log y_a$ is the log of life insurance premiums paid by individuals of age a, J is the order of polynomial, *age* is the age normalized to be equal to 0 at the cutoff, $[a_l, a_u]$ is the excluded range around the notch point, $\mathbb{1}$ is the indicator function and ε_a is the error term

Estimating the counterfactual distribution, Bunching and Holes

- Estimate of counterfactual distribution :

$$\log y_a^c = \sum_{j=0}^{J} \hat{\beta}_j \cdot (age_a)^j \tag{1}$$

- Estimates of excess bunching and hole (missing mass) :

$$\hat{b} = \frac{\sum_{a=a_l}^{\bar{a}} \log y_a - \log y_a^c}{\log y_{\bar{a}}^c}$$

$$\hat{m} = \frac{\sum_{a=\bar{a}}^{a_u} \log y_a^c - \log y_a}{\log y_{\bar{a}}^c}$$

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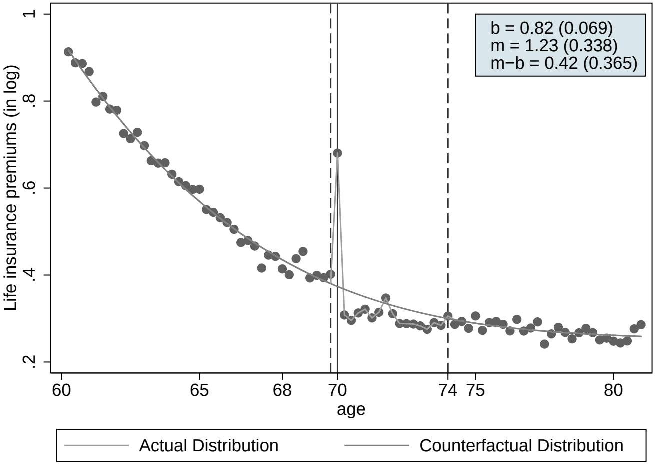

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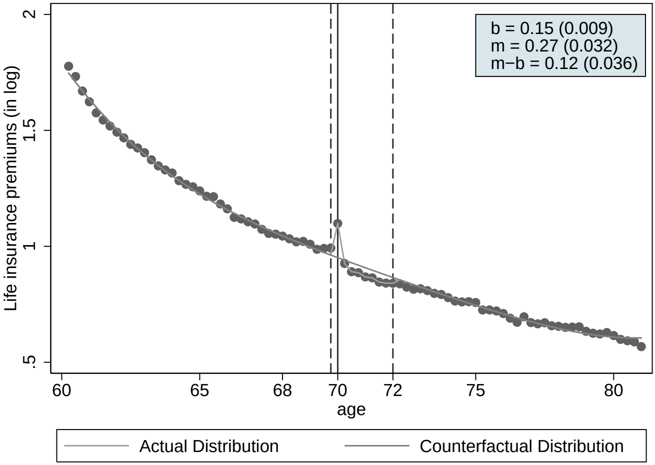
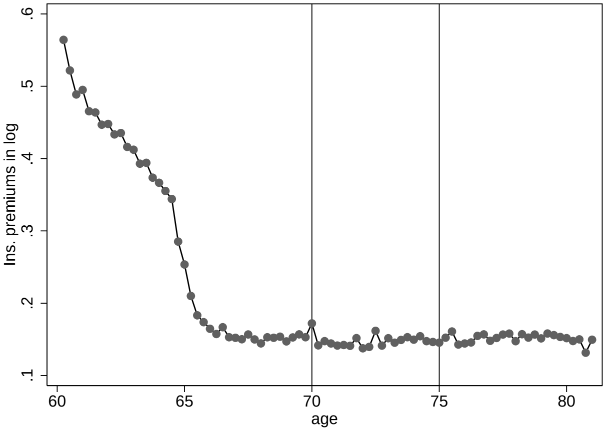


Sample : Standard life insurance policies
(taken out after 11/20/1991)

FIGURE 5: Robustness Check : Life insurance taken out before 11/20/1991



Source : Life insurance policy from Axa, France 2003-2013

Estimating timing responses

$$\log y_a = \sum_{j=0}^{J} \beta_j \cdot (age_a)^j + \gamma_1 \cdot \mathbb{1}_{a_l \leq age_a \leq \bar{a}} + \gamma_2 \cdot \mathbb{1}_{\bar{a} < age_a \leq a_u} + \varepsilon_a \qquad (2)$$

- $\mathbb{1}_{a_l \leq age_a \leq \bar{a}}$ and $\mathbb{1}_{\bar{a} < age_a \leq a_u}$ are respectively age dummies for being in the excluding range below or above the notch.
- γ_1 : short-term timing responses
- γ_2 medium-term timing responses

TABLE 5: Absolute value of timing responses and reduced-form elasticity estimates

	Timing responses		**Reduced-form elasticity**		Horizon of
	short term	medium term	short term	medium term	timing responses
Standard insured	0.15*** (0.008)	0.03*** (0.004)	0.51*** (0.028)	0.11*** (0.013)	2 years
Wealthy insured	0.31*** (0.023)	0.03*** (0.008)	1.07*** (0.081)	0.10*** (0.029)	4 years

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Bootstrap standard errors in parentheses. The reduced-form elasticities are computed by dividing timing responses by $\log(1-0.4) - log(1-0.2)$ and the standard errors associated are derived by the delta method.

TABLE 6: Absolute value of timing responses and reduced-form elasticity estimates for insured with life insurance between 100,000€ and 700,000€

	Timing responses		**Reduced-form elasticity**		Horizon of
	short term	medium term	short term	medium term	timing responses
Standard insured	0.36*** (0.03)	0.035*** (0.012)	1.24*** (0.10)	0.12*** (0.041)	4 years
Wealthy insured	0.37*** (0.046)	0.049*** (0.015)	1.29*** (0.16)	0.17*** (0.052)	4 years

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Bootstrap standard errors in parentheses. The reduced-form elasticities are computed by dividing timing responses by $\log(1-0.4) - \mathit{log}(1-0.2)$ and the standard errors associated are derived by the delta method.

Results on timing response estimation :

- Strong short-term inter-temporal shifting elasticity
  - varying with level of wealth
- Moderate medium-term inter-temporal shifting elasticity around 0.1
- Difference among short-term elasticities is explained by the difference in time horizon

- Life insurance taxation can also generate :
  - Shifting among asset portfolio
  - Wealth dis-accumulation
- Empirical Strategy : Difference-in-differences
  - Life insurance tax change implemented in 1992 is not retroactive
  - No tax change at age 70 for life insurance policy taken out before 11/20/1991 (control group)
  - Tax change at age 70 for life insurance policy taken out after 11/20/1991 (treated group)
- Comparability issue
  - Life insurance premiums observed only during 2003-2013
  - Sample restricted to life insurance policies taken out $\pm$ 2 years around 11/20/1991

The Preferential tax scheme for life insurance

TABLE 7: Life insurance taxation at death since 1998

	Insurance premiums paid	
	Before aged 70	After aged 70
Life insurance taken out		
Before 11/20/1991	Flat tax rate of 20%	
After 11/20/1991	Flat tax rate of 20%	Recalled into the inheritance tax base

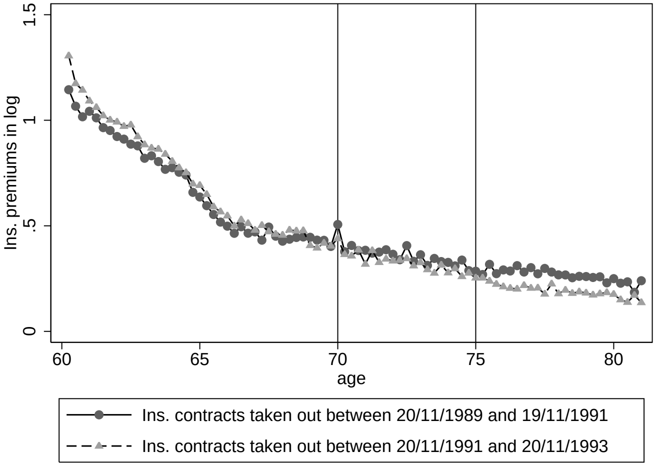
Note : Top inheritance tax rate goes up to 40% for spouses and direct descendants and 60% for collateral heirs.

Potential selection problem :

- Sample includes only life insurance policies :
  a) not terminated before 2003
  b) not terminated during lifetime between 2003 and 2013
  - Reform should not play on a) and b) because of the existence of a supplemental tax exemption for life insurance
- individuals could anticipate the reform by subscribing life insurance policy just before its implementation
  - the 1992 law was applied to life insurance policies taken out after 20/11/1991, i.e 40 days before the law was voted

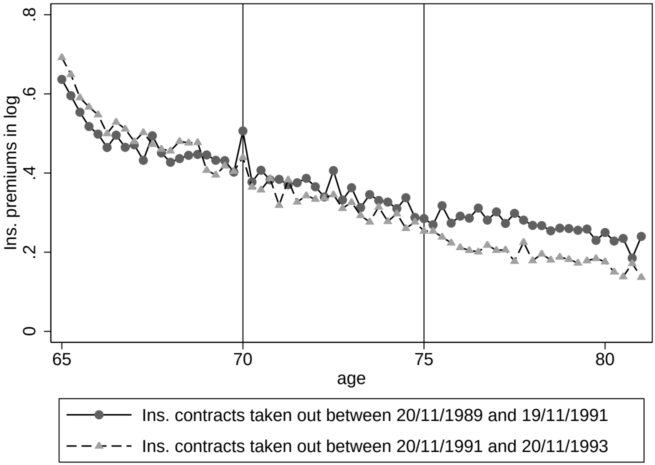
Selection bias

FIGURE 6: Life insurance premiums by age of the owners, France 2003-2013



Robustness Robustness 70

FIGURE 7: Life insurance premiums by age of the owners, France 2003-2013



Robustness Robustness 70

Diff-in-Diff estimation

$$\log y_{iat} = \delta \cdot \mathrm{Diff}_{ia} \qquad + \alpha_i + \gamma_a + \nu_t + \varepsilon_{iat} \tag{3}$$

$$\log y_{iat} = \delta_1 \cdot \mathrm{Diff1}_{ia} + \delta_2 \cdot \mathrm{Diff2}_{ia} \qquad + \alpha_i + \gamma_a + \nu_t + \varepsilon_{iat} \tag{4}$$

- $\log y_{iat}$ = log of life insurance premiums paid by individual i of age a at time t
- α_i, γ_a and ν_t are respectively individual, age and time fixed effects
- $Diff_i a$: being in the treatment group and aged more than 70 years old
- $Diff1_{ia}$ being in the treatment group and aged between 70 and 75 years old
- $Diff2_{ia}$: being in the treatment group and aged between 75 and 80 years old

TABLE 8: Panel estimates of the effect of inheritance tax change on life insurance premiums in France, 2003-2013

	(1)	(2)	(3)
	Treatment : Aged 70 or more		
	Average effect	Between 70 and 75	After 75
Reduced-form estimate	-0.073***	-0.068***	-0.100***
	(0.020)	(0.020)	(0.024)
Elasticity $\frac{d \log y}{d \log 1-\tau}$ estimate	0.254***	0.236***	0.346***
	(0.069)	(0.069)	(0.084)
Number of observations	673128	673128	673128
Number of individuals	25858	25858	25858

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The standard errors in parentheses are clustered at the individual level.
The reduced-form elasticities are computed by dividing timing responses by $\log(1-0.4) - log(1-0.2)$ and the standard errors associated are derived by the delta method.

Robustness checks

- Varying the window width for sample selection : Robustness 1
- Falsification experiments :
  - Both groups not affected by the tax change : Robustness 2
  - Both groups affected by the tax change : Robustness 3

Findings

- Aggregate elasticity of real and shifting responses
  - Medium-term elasticity = 0.35
  - Long-term elasticity = 0.24
- Implications on wealth accumulation and bequest motives :
  - Increasing effect of inheritance taxation with respect to age :
    Evidence that individuals fail to plan for the disposition of an estate well in advance
  - Timing responses less important than aggregate shifting and real responses
    Evidence of “Wealth loving” motive

Outline

Novelty of the model

- Introduction of two assets in an inter-temporal framework
- Life insurance does not yield utility during lifetime but tangible assets do
  - Housing or Business ownership may yield power or social status.
  - Utility of wealth per se (secondary residence next to the sea, family house)
- Trade-off between life insurance and tangible assets
  - Life insurance benefits from preferential inheritance taxation
  - tangible assets yield utility during lifetime and at death

Set up

- Three periods
  - Period 1 : individuals aged between 20 and 70 years old
  - Period 2 : individuals aged between 70 and 80 years old
  - Period 3 : individuals die at age 80 and leave a bequest
- For each period during lifetime, individuals choose between
  - Consuming C_t
  - Accumulating life insurance X_t for bequest purpose
  - Saving to increase their tangible asset holdings

- During lifetime, individuals derive utility from consumption and tangible asset holdings but not from life insurance accumulation

$$U(C_t, W_t) = u(C_t) + v(W_t) = \frac{c_t^{1-s_c}}{1-s_c} + \frac{W_t^{1-s_w}}{1-s_w} \tag{5}$$

- At death, individuals derive utility from bequeathing total life insurance accumulation and end-of-life wealth

$$\phi(B) = \phi(W_2, X_1, X_2) = \frac{\left(R_x^2(1-\tau_1)X_1 + R_x(1-\tau_2)X_2 + R_w \cdot (1-\tau_w) \cdot W_2\right)^{1-s_b}}{1-s_b} \tag{6}$$

Decision Problem

$$
\begin{cases}
V(W_t, C_t, X_t) = \max(\sum_{t=1}^{2} \beta^{t-1} \cdot U(C_t, W_t) + \beta^2 \phi(B)) \\
\text{subject to} \\
W_t = R_w \cdot W_{t-1} + Y_t - C_t - X_t \\
B = R_x^2(1-\tau_1)X_1 + R_x(1-\tau_2)X_2 + R_w \cdot (1-\tau_w) \cdot W_2 \\
R_x > R_w, \tau_1 < \tau_2 < \tau_w
\end{cases}
\tag{7}
$$

Impact of the reform of the preferential tax scheme ?

When τ_2 increase then X_2 decreases and is substituted by

- C_1 and C_2 (real responses)
- W_1 and W_2 (Shifting among asset portfolio responses)
- X_1 (timing responses)

- Retiming responses

$$\frac{\partial v}{\partial W_1} = \beta^2 [R_x^2 (1-\tau_1) - R_x R_w (1-\tau_2)] \frac{\partial \phi}{\partial B}$$

- Shifting among asset portfolio

$$\frac{\partial v}{\partial W_2} = \beta \left(R_x (1-\tau_2) - R_w (1-\tau_w) \right) \frac{\partial \phi}{\partial B}$$

- Increase of the consumption

$$\frac{\partial u}{\partial C_2} = \beta R_x (1-\tau_2) \frac{\partial \phi}{\partial B}$$

Outline

Policy implications

- Optimal inheritance tax design
  - Tax-neutrality across assets
  - Broadening the tax base
- Life insurance reform
  - Improve partially the inheritance tax design
  - But introduce new avoidance opportunities through timing responses
- Optimal inheritance tax in absence of the preferential tax scheme ?

- The government want to maximise social welfare of a particular group
- Sufficient statistic formula for optimal inheritance tax rate (Piketty and Saez (2013))

$$\tau_B = \frac{1 - \left[1 - \frac{e_L \tau_L}{1-\tau_L}\right] \left[\frac{\bar{b}^{\text{received}}}{\bar{y}_L}(1+\hat{e}_B) + \frac{\nu}{R/G}\frac{\bar{b}^{\text{left}}}{\bar{y}_L}\right]}{1 + \hat{e}_B - \left[1 - \frac{e_L \tau_L}{1-\tau_L}\frac{\bar{b}^{\text{received}}}{\bar{y}_L}(1+\hat{e}_B)\right]} \quad (8)$$

- $\bar{b}^{\text{left}}$,$\bar{b}^{\text{received}}$ and $\bar{y}_L$ are respectively the ratios of bequest left, bequest received and earnings of the sub-group targeted by the government to population averages.
- e_B and e_L are respectively the elasticities of aggregate taxable bequests and taxable income.
- $R/G = e^{(r-g)H}$ with r the return on capital and g the growth rate.
- ν is the parameter for pure bequest motive.

TABLE VII – OPTIMAL INHERITANCE TAX RATE CALIBRATIONS

	Optimal Tax Rate (by Percentile of Bequest Received)									
	France					U.S.				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fraction of the Bequest Elasticity due to Real Responses	100%	75%	50%	25%	0%	100%	75%	50%	25%	0%
Real Elasticity	0,25	0,19	0,13	0,06	0,00	0,25	0,19	0,13	0,06	0,00
1. Optimal Linear Tax Rate by Percentile of Bequest Received										
Meritocratic Rawlsian Case : P0-50	61%	64%	67%	71%	76%	56%	59%	63%	66%	70%
Median Voter Case : P40-60	59%	63%	66%	70%	74%	56%	59%	63%	66%	71%
Pro-Capitalist Case : P90-95	-340%	-328%	-315%	-300%	-284%	-93%	-82%	-70%	-57%	-43%
2. Optimal Top Tax Rate Above Positive Exemption Amount for Zero Receivers (bottom 50%)										
Above 500,000	61%	66%	72%	79%	88%	55%	58%	62%	67%	73%
Above 1,000,000	61%	67%	74%	82%	92%	54%	58%	62%	67%	73%

- Optimal tax rate in Meritocratic Rawlsian case and Median Voter case :
  - in France : 60%-70%
  - in the USA : 55%-65%
  - When elasticity is due entirely to real responses : $\tau_B = 60\%$
- Bottom 50% receivers and Median voter
  - leave substantially less wealth than average to their heirs
  - have earnings close to average
- Optimal policy is to increase inheritance tax rate and reduce labor tax rate
- In the Pro-capistalistic case, inheritance should be subsidized

Conclusion

- First comprehensive study of behavioral responses to inheritance tax
- We have benefited from :
  - First-time access to longitudinal data set of life insurance policies
  - Compelling variation created by the French preferential tax scheme for life insurance transmitted at death
- Estimation of two kinds of behavioral responses
  - Timing responses using bunching estimation :
    Strong short-term timing responses reflect moderate inter-temporal shifting in the medium term
  - Aggregate real and shifting among asset portfolio responses :
    Medium-term elasticity = 0.35 Long-term elasticity = 0.24

Conclusion

- Motivations behind bequest motives :
  - Increasing effect of inheritance taxation with respect to age :
    Evidence that individuals fail to plan for the disposition of an estate well in advance
  - Timing responses less important than aggregate shifting and real responses
    Evidence of “Wealth loving” motive
- Policy implications :
  - Optimal tax rate might be as large as 60%–70% in the median voter or meritocatric rawlsian case
  - Inheritance should be subsidized in the Pro-capitalistic case

Outline

BACK UP SLIDES

The Preferential tax scheme for life insurance

TABLE 9: Life insurance taxation at death since 1998

	Insurance premiums paid	
	Before aged 70	After aged 70
Life insurance taken out		
Before 11/20/1991	Flat tax rate of 20%	
After 11/20/1991	Flat tax rate of 20%	Recalled into the inheritance tax base

Note : Top inheritance tax rate goes up to 40% for spouses and direct descendants and 60% for collateral heirs.

Return bunching Return Diff-in-Diff

Panel A : Life insurance policies taken out after 20/11/1991

	All life insurance owners	Wealthy insured	Standard insured
Age	68.5	69.5	68.4
	(5.88)	(6.04)	(5.85)
Life insurance policy (in '000s of 2013 euros)			
mean	60.2	192.7	41.7
p50	14.5	54.7	11.5
p99	611.2	2,002.5	419.1
P99-100	1,757.7	6,473.7	829.8
Life insurance premiums (in '000s of 2013 euros)			
mean	1.2	3.0	0.9
p99	20.1	41.8	17.8
Number of observations	7,826,454	958,265	6,868,189
Number of individuals	347,253	41,074	306,179
Average number of spells	22.5	23.3	22.4
Duration of the contract (in years)	12.4	13.5	12.3

Panel B. Life insurance policies taken out between 20/11/1989 and 20/11/1993

	All	policies taken out before 20/11/1991	policies taken out after 20/11/1991
Age	70.2	70.1	70.2
	(6.25)	(6.24)	(6.27)
Life insurance policy (in '000s of 2013 euros)			
mean	89.5	73.5	106.4
p50	26.3	23.5	29.5
p99	822.3	719.1	967.7
P99-100	2,970.7	1,987.6	3,978.3
Life insurance premiums (in '000s of 2013 euros)			
mean	0.6	0.6	0.6
p99	2.9	2.5	3.2
Number of observations	747,307	383,153	364,154
Number of individuals	31,073	15,514	15,559
Average number of spells	24.1	24.7	23.4
Duration of the contract (in years)	21.9	23.0	20.8

Return

Estimating the empirical distribution

- Fit a flexible polynomial to the empirical distribution, excluding data in a range around the notch

$$\log y_a = \sum_{j=0}^{J} \beta_j \cdot (a)^j + \sum_{k=a_l}^{a_u} \gamma_k \cdot \mathbb{1}_{a=k} + \varepsilon_a$$

where $\log y_a$ is the log of life insurance premiums paid by individuals of age a, J is the order of polynomial, a is the age normalized to be equal to 0 at the cutoff, $[a_l, a_u]$ is the excluded range around the notch point, $\mathbb{1}$ is the indicator function and ε_a is the error term

Estimating the counterfactual distribution, Bunching and Holes

- Estimate of counterfactual distribution :

$$\log y_a^c = \sum_{j=0}^{J} \hat{\beta}_j \cdot (a)^j \tag{9}$$

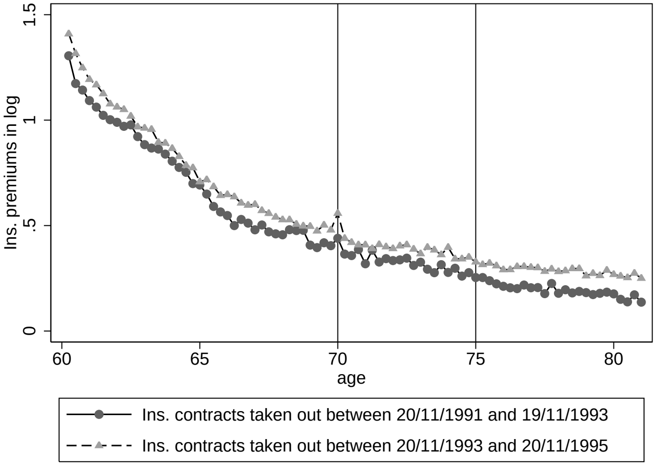
- Estimates of excess bunching and hole (missing mass) :

$$\hat{b} = \frac{\sum_{a=a_l}^{\bar{a}} \log y_a - \log y_a^c}{\log y_{\bar{a}}^c}$$

$$\hat{m} = \frac{\sum_{a=\bar{a}}^{a_u} \log y_a^c - \log y_a}{\log y_{\bar{a}}^c}$$

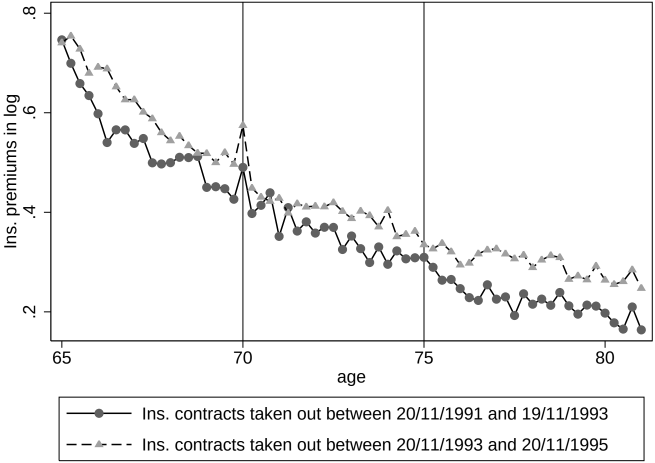
Return

FIGURE 8: Falsification experiment with both groups affected by the tax change



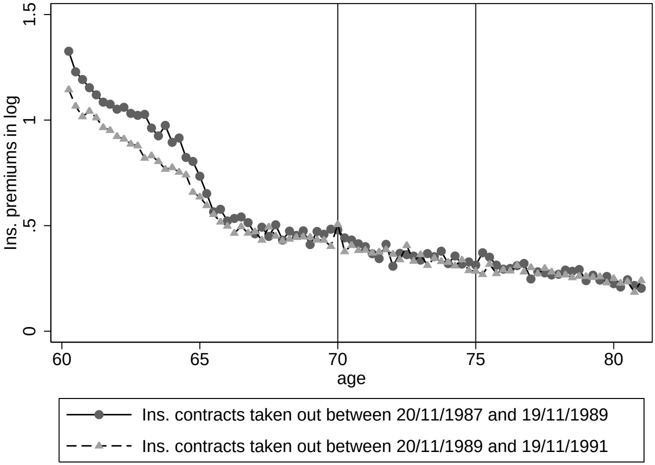
Return

FIGURE 9: Falsification experiment with both groups affected by the tax change



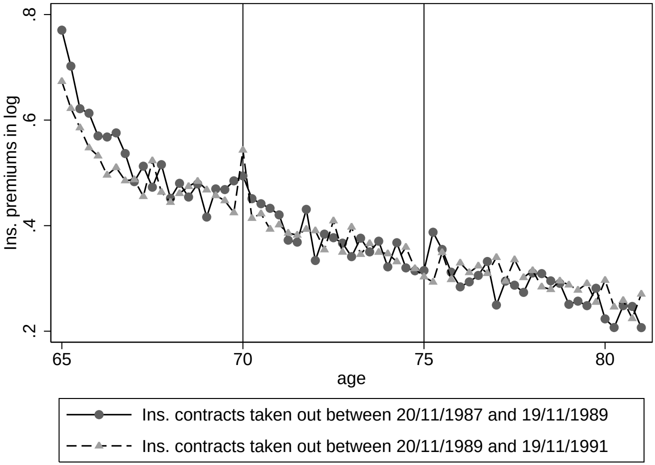
Return

FIGURE 10: Falsification experiment with both groups unaffected by the tax change



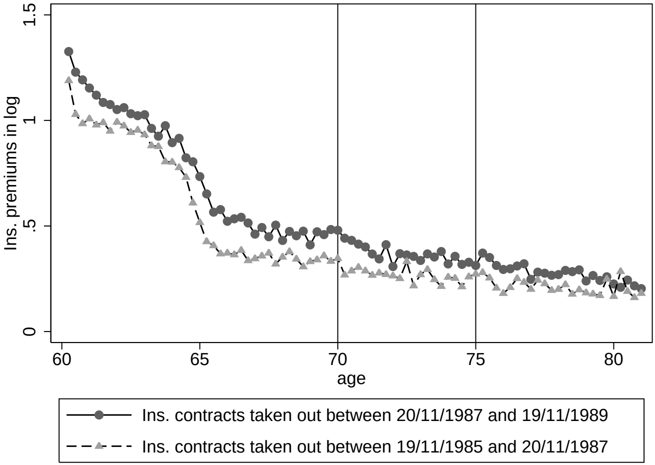
Return

FIGURE 11: Falsification experiment with both groups unaffected by the tax change



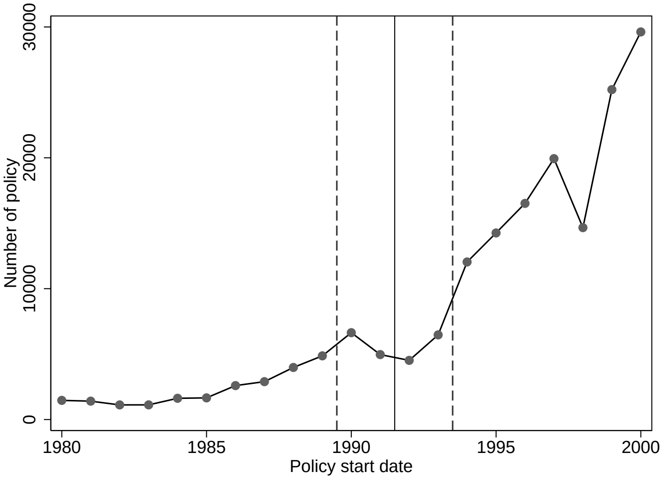
Return

FIGURE 12: Other distributions from life insurance taken out before 11/20/1991



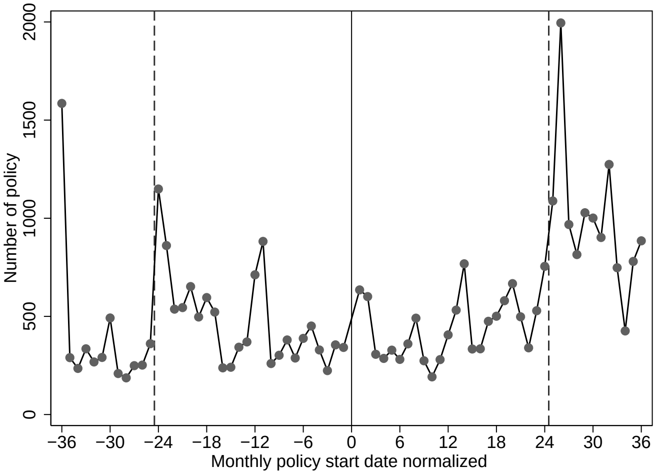
Return

FIGURE 13: Number of life insurance policies by year of subscription



Return

FIGURE 14: Number of life insurance policies by date of subscription



Return

TABLE 10: Narrowing the window "±1 year"

	(1)	(2)	(3)
	Treatment : Aged 70 or more		
	Average effect	Between 70 and 75	After 75
(Policy taken out between 20/11/1990 and 20/11/1992)			
Reduced-form estimate	-0.059**	-0.048	-0.115***
	(0.030)	(0.030)	(0.037)
Elasticity $\frac{d \log y}{d \log 1-\tau}$ estimate	0.204**	0.168	0.401***
	(0.103)	(0.103)	(0.130)
Number of observations	286425	286425	286425
Number of individuals	10864	10864	10864

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The standard errors in parentheses are clustered at the individual level.

TABLE 11: Widening the window "±5 years"

	(1)	(2)	(3)
	Treatment : Aged 70 or more		
	Average effect	Between 70 and 75	After 75
(Policy taken out between 20/11/1986 and 20/11/1996)			
Reduced-form estimate	-0.061***	-0.059***	-0.072***
	(0.011)	(0.011)	(0.014)
Elasticity $\frac{d \log y}{d \log 1-\tau}$ estimate	0.210***	0.203***	0.249***
	(0.039)	(0.039)	(0.049)
Number of observations	2269600	2269600	2269600
Number of individuals	87286	87286	87286

* p < 0.1, ** p < 0.05, *** p < 0.01. The standard errors in parentheses are clustered at the individual level.

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TABLE 12: Robustness Check 2 : Both groups unaffected by the reform

	(1)	(2)	(3)
	Treatment : Aged 70 or more		
	Average effect	Between 70 and 75	After 75
(Policy taken out between 20/11/1987 and 20/11/1991)			
Reduced-form estimate	-0.035*	-0.037*	-0.025
	(0.019)	(0.019)	(0.024)
Elasticity $\frac{d \log y}{d \log 1-\tau}$ estimate	0.122*	0.128*	0.087
	(0.066)	(0.065)	(0.084)
Number of observations	586490	586490	586490
Number of individuals	23448	23448	23448

* p < 0.1, ** p < 0.05, *** p < 0.01. The standard errors in parentheses are clustered at the individual level.

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TABLE 13: Robustness Check 3 : Both groups affected by the reform

	(1)	(2)	(3)
	Treatment : Aged 70 or more		
	Average effect	Between 70 and 75	After 75
(Policy taken out between 20/11/1991 and 20/11/1995)			
Reduced-form estimate	0.027	0.024	0.042*
	(0.018)	(0.018)	(0.022)
Elasticity $\frac{d \log y}{d \log 1-\tau}$ estimate	-0.093	-0.083	-0.147*
	(0.062)	(0.062)	(0.077)
Number of observations	1113739	1113739	1113739
Number of individuals	42325	42325	42325

* p < 0.1, ** p < 0.05, *** p < 0.01. The standard errors in parentheses are clustered at the individual level.

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