# Who Owns Children and Does It Matter?

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November 2009

# What we do

1. Parents have lost rights over children's labor income.
2. Explore implications in theoretical model:

   OLG with altruistic fertility choice:

   - Fertility decreases as parents loose rights (positive).
   - Fertility may be inefficiently low (normative).

     $\rightarrow$ Relation to Coase's theorem

     $\rightarrow$ Relation to OLG efficiency results

   Policy implications:

   PAYG pensions, Fertility dependent PAYG, Fertility subsidy and Gov. debt
3. Conclusion and what's next

# Who owns children's labor income?

Who can legally (and feasibly) make decisions about a child as a resource?

- the parents? the child? the government?
- Clearly a child cannot decide to be born.
- Laws and cultural norms determine
  - mandatory parental support;
  - parent's control over children;
  - allocation of power between generations.

We document historical shift in rights from parents to children (U.S., U.K. & France)

# Stubborn Son Law

## Act of the General Court of Massachusetts in 1646:

*If a man have a stubborn or rebellious son, of sufficient years and understanding, viz. sixteen years of age, which will not obey the voice of his Father or the voice of his Mother, and that when they have chastened him will not harken unto them: then shall his Father and Mother being his natural parents, lay hold on him, and bring him to the Magistrates assembled in Court and testify unto them, that their son is stubborn and rebellious and will not obey their voice and chastisement . . .* ***such a son shall be put to death****.*

States that followed were Connecticut 1650, Rhode Island 1668, New Hampshire 1679.

history next

# Old Age Support for Parents

## English Poor Laws of 1601:

"The family, as a unit, was to be responsible for poverty-stricken kinfolk[...] The Poor Law did not concentrate on the children of elderly, but extended the network of potential support to include the fathers and mothers, and the grandfathers and grandmothers, of the poor[...] **When these laws passed over into the American scene, during the seventeenth and eighteenth centuries, the focus was on the responsibilities of children towards their elderly parents[...]**" (Callahan 1985, pg 33)

## Code Napoléon (1804), Art. 205:

"Children are liable for the maintenance of their parents and other ascendants in need."

# Other Legal Ways of Controlling Children

Patria Potestad (Spain and France) – “The control which a father exercised over his children, a control similar to that over material things and one which permitted a father to sell or pawn a child if necessary and even to eat it in an extreme case”

Lettres de Cachet – “Letters signed by the king often used to enforce authority and sentence someone without trial. They could be used by parents when their child refused to follow parental direction with respect to a marriage partner or **career**.”

Parental consent in marriage decisions (Code Napoléon 1804) – “[...]children, regardless of age, were bound to seek the consent of their parents (or grandparents if both parents were deceased) (Article 151).”

# Living Arrangements

*"Considerable evidence suggests that parents in the now-developed countries once enjoyed important economic benefits from child-rearing, not only because children began to work at an early age, but also because parental control over assets such as family farms gave them leverage over adult children."* (Folbre, 1994)

*"[...] the decline of intergenerational coresidence resulted mainly from increasing opportunities for the young and declining parental control over their children."* (Ruggles, 2007)

# Shift in Rights over Children (Children's Income)

Pre-1900:

- Mandatory parental support:
  - Poor Law Act 1601
  - Code Napoléon, Art. 205.
- Indirect control:
  - Corporal punishment/ physical cruelty legal.
  - Patria potestad and lettres de cachet.
  - Indenture of children legal.
  - Parental consent required for marriage, medical,...
- Living arrangements
  - Extended family

Parents own children's income

20th Century:

Laws revoked/weaker.

- Abused children removed from parents.
- Age of majority decreased.
- Banned child labor.
- Parental consent not required.

- Nuclear family

Children own their income

# The Model

## Households:

$$\max U_t = u(c_t^m) + \beta u(c_{t+1}^o) + \gamma u(n_t) + \zeta \frac{\int_0^n U_{t+1}^i di}{n_t}$$

$$c_t^m + \theta_t n_t + s_{t+1} \leq w_t(1 + b_t)$$

$$c_{t+1}^o + \int_0^{n_t} b_{t+1}^i w_{t+1} di \leq r_{t+1} s_{t+1}$$

$$b_{t+1}^i \geq \underline{b}_{t+1}$$

$$c_t^m, c_{t+1}^o, n_t, s_{t+1} \geq 0$$

# The Model

## Households:

$$\begin{aligned}\max U_t =& u(c_t^m) + \beta u(c_{t+1}^o) + \gamma u(n_t) + \zeta U_{t+1} \\ & c_t^m + \theta_t n_t + s_{t+1} \leq w_t(1 + b_t) \\ & c_{t+1}^o + n_t b_{t+1} w_{t+1} \leq r_{t+1} s_{t+1} \\ & b_{t+1} \geq \underline{b}_{t+1}\end{aligned}$$

$\underline{b}_{t+1}$ can be interpreted as property rights:

- $\underline{b}_{t+1} = -1$ parents own children's income
- $\underline{b}_{t+1} = 0$ children own their own income

# The Model

## Households:

$$\begin{aligned}\max U_t =& u(c_t^m) + \beta u(c_{t+1}^o) + \gamma u(n_t) + \zeta U_{t+1} \\ & c_t^m + \theta_t n_t + s_{t+1} \leq w_t(1 + b_t) \\ & c_{t+1}^o + n_t b_{t+1} w_{t+1} \leq r_{t+1} s_{t+1} \\ & b_{t+1} \geq \underline{b}_{t+1}\end{aligned}$$

## Production:

$$\begin{aligned}L_t &= n_{t-1} \\ K_t &= s_t = k_t n_{t-1} \\ w_t &= F_L(k_t, 1) \\ r_t &= F_K(k_t, 1)\end{aligned}$$

# Costs and Benefits of Child-rearing

$$\gamma u'(n_t) = u'(c_t^m)\left[\theta_t + \frac{b_{t+1} w_{t+1}}{r_{t+1}}\right]$$

The higher $\underline{b}_{t+1}$, the more likely constraint is binding

$\rightarrow$ increases cost of children.

Distorts incentive to have children.

Equalizing intergenerational MU:

$$\beta u'(c_{t+1}^o) n_t = \zeta u'(c_{t+1}^m) + \lambda_{b,t+1}$$

$\lambda_{b,t+1}$: how far off most preferred allocation?

# Optimal Transfer
## $\underline{b} = -\infty$

Assume: $\gamma > \zeta(1+\gamma+\beta) > 0$, $u(\cdot) = \log(\cdot)$.

$$b^* = \frac{\theta r^* \zeta(1+\beta+\gamma) - w^*\gamma}{w^*(\gamma - \zeta(1+\gamma+\beta))}$$

Note:

- $b^*$ may be negative – even with altruism.
- Especially if $\zeta$ small, $\gamma$ large, $w$ high or $r$ low.
- Suggests that even altruistic parents want to "steal" from their children in many circumstances.

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# Solution with binding constraint $\underline{b} > b^*$

$$\beta\theta_t \frac{F_K(\hat{k}_{t+1}, 1)}{F_N(\hat{k}_{t+1}, 1)} + (\beta + \gamma)\underline{b}_{t+1} = \gamma \frac{F_K(\hat{k}_{t+1}, 1)}{F_N(\hat{k}_{t+1}, 1)} \hat{k}_{t+1}.$$

Comparative Statics:

The capital-labor ratio next period, $k_{t+1}$, is independent on $\underline{b}_t$.

If $K$ and $L$ substitutable enough, then

the capital-labor ratio next period, $k_{t+1}$, is increasing in $\underline{b}_{t+1}$.

# Solution with binding constraint $\underline{b} > b^*$

$$\beta\theta_t \frac{F_K(\hat{k}_{t+1}, 1)}{F_N(\hat{k}_{t+1}, 1)} + (\beta + \gamma)\underline{b}_{t+1} = \gamma \frac{F_K(\hat{k}_{t+1}, 1)}{F_N(\hat{k}_{t+1}, 1)} \hat{k}_{t+1}.$$

Comparative Statics:

$\Rightarrow$ As parents loose rights over children's labor income, $\underline{b}_{t+1} \nearrow$,

the relative returns to savings and children change;

substitute away from children towards savings, $k_{t+1} = \frac{s_{t+1}}{n_t} \nearrow$.

$$\Rightarrow \quad \frac{d\hat{k}_{t+1}}{\underline{b}_{t+1}} > 0 \quad \Rightarrow \quad \frac{d\hat{w}_{t+1}}{\underline{b}_{t+1}} > 0, \quad \frac{d\hat{r}_{t+1}}{\underline{b}_{t+1}} < 0.$$

# Solution with binding constraint

$$b^* < \underline{b}_t \leq \underline{b}_{t+1}$$

$$\hat{n}_t = \frac{\gamma}{1+\beta+\gamma}\left(\frac{\hat{w}_t + \underline{b}_t}{\theta_t + \frac{\underline{b}_{t+1}\hat{w}_{t+1}}{\hat{r}_{t+1}}}\right)$$

Result 1: Holding $\underline{b}_t$ (and $\hat{w}_t$) fixed: $\frac{d\hat{n}_t}{d\underline{b}_{t+1}} < 0$

$\rightarrow$ Equil. fertility initially decreases in $\underline{b}_{t+1}$.

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# Solution with binding constraint $b^* < \underline{b}_t = \underline{b}_{t+1}$

$$\hat{n}_t = \frac{\beta + \gamma}{1 + \beta + \gamma} \left( \frac{\hat{w}_t(\underline{b}) + \underline{b}}{\theta_t + \hat{k}_{t+1}(\underline{b})} \right)$$

Result 1: Holding $\underline{b}_t$ (and $\hat{w}_t$) fixed: $\frac{d\hat{n}_t}{d\underline{b}_{t+1}} < 0$

$\rightarrow$ Equil. fertility initially decreases in $\underline{b}_{t+1}$.

Result 2: Total derivative wrt $\underline{b} = \underline{b}_t = \underline{b}_{t+1}$: $\frac{d\hat{n}_t}{d\underline{b}} \gtreqless 0$

$\rightarrow$ If $\underline{b}$ large enough, then st. st. fertility decreases in $\underline{b}$.

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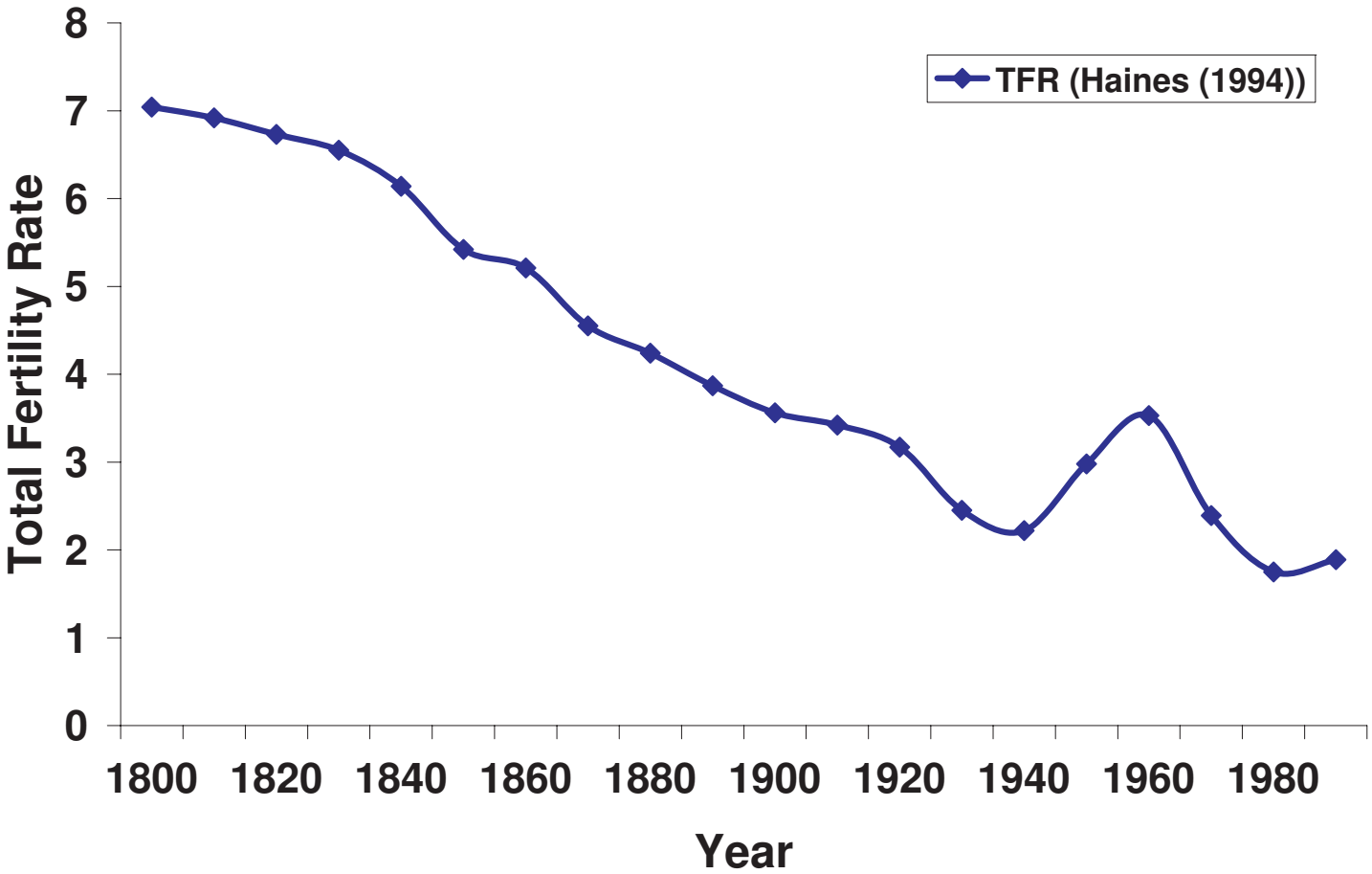
# U.S. Total Fertility Rate




Property rights shift may have contributed to fertility decline.

# $\mathcal{A}$- and $\mathcal{P}$-Efficiency

Golosov, Jones and Tertilt (2007)

## Definition

A feasible allocation is $\mathcal{A}$-efficient if there is no other feasible allocation such that all people *alive* under both allocations are no worse off and at least one is strictly better off.

## Definition

A feasible allocation is $\mathcal{P}$-efficient if there is no other feasible allocation such that all *potential* people are no worse off and at least one is strictly better off. (*)

[(*)Note: requires a utility function that is defined over states of the world where a person is not born.]

# Efficiency Results

## Proposition

*If $\underline{b}_t = -\infty$ for all $t$, then the equilibrium allocation, $a^* = \{c_t^{m*}, c_{t+1}^{o*}, n_t^*, s_{t+1}^*, k_t^*, b_{t+1}^*\}_{t=0}^{\infty}$, is $\mathcal{A}$- (and $\mathcal{P}$-) efficient.*

## Proposition

*If $\lambda_{b,s+1} > 0$ for some generation $s$, then the equilibrium allocation, $\hat{a} = \{\hat{c}_t^m, \hat{c}_{t+1}^o, \hat{n}_t, \hat{s}_{t+1}, \hat{k}_t, \hat{b}_{t+1}\}_{t=0}^{\infty}$, is $\mathcal{A}$- (and $\mathcal{P}$-) inefficient.*

# $\mathcal{A}$-superior allocation to $\hat{a}$

Generation $s$ receives:

$$\widetilde{c}_s^m = \hat{c}_s^m - \theta_s \varepsilon \qquad \widetilde{n}_s = \hat{n}_s + \varepsilon$$
$$\widetilde{c}_{s+1}^o = \hat{c}_{s+1}^o + (\delta - \underline{b}\hat{w}_{s+1})\varepsilon \qquad \widetilde{s}_{s+1} = \hat{s}_{s+1}.$$

$\varepsilon$ mass of newborn children (adult in $s+1$) receive:

$$\widetilde{c}_n^m = \frac{F(\hat{s}_{s+1}, \widetilde{n}_s) - F(\hat{s}_{s+1}, \hat{n}_s)}{\varepsilon} - \hat{s}_{s+2} - \theta_{s+1}\hat{n}_{s+1} + \underline{b}\hat{w}_{s+1} - \delta$$
$$\widetilde{c}_n^o = \hat{c}_{s+2}^o \qquad \widetilde{n}_n = \hat{n}_{s+1} \qquad \widetilde{s}_n = \hat{s}_{s+2}$$

Everyone else receives the same as in $\hat{a}$.

# $\mathcal{A}$-superior allocation to $\hat{a}$

Allocation $\mathcal{A}$- and $\mathcal{P}$-superior:

- Generation $s$: $\frac{\frac{\partial \widetilde{U}_S(\epsilon,\delta)}{\partial \epsilon}\Big|_{\epsilon=0}}{\partial \delta}\Big|_{\delta=0} = \frac{\lambda_{b,s+1}}{\hat{n}_s} > 0$
- All others alive in $\hat{a}$: $\widetilde{U}_{i,t} = \hat{U}_{i,t} \quad \forall i \in [0, \hat{n}_t], \forall t \neq s$
- Mass $\varepsilon$ new children: $U(\widetilde{a}) > u(\mathit{unborn})$.

# Efficiency Results and Coase's Theorem

## Coase's Theorem

Property rights don't matter for efficiency of allocation

—if bargaining is possible.

## Our results

1. When parents "own" children, costs and benefits of having children borne by same people: parents.
   $\rightarrow$ equilibrium fertility is efficient
2. When parents don't "own" children, costs and benefits of having children borne by different people. Parents bear cost, children reap benefits.
   $\rightarrow$ equilibrium fertility not efficient
3. Unborn children cannot write contract with parents when property rights are assigned to them by law.

# Literature: Efficiency in OLG

| | exogenous fertility | endogenous fertility |
|---|---|---|
| no altruism | Samuelson (1958), Cass (1972), Balasko and Shell (1980)<br>$(r > n)$ nec. & suff. for PO | Michel, Wigniolle (2007), Conde-Ruiz, Giménez and Pérez-Nievas (2004)<br>$(r > n)$ not suff. for M-eff.<br>$(\theta r > w)$ suff. for M-eff. |
| with altruism | Barro (1974), Burbidge (1983)<br>"operative transfers" nec. & suff PO | Pazner and Razin (1979)<br>$(r > n)$ always, efficient |

What our analysis adds:

- Non-altruistic models implicity assume children own themselves, while altruistic models implicitly assume parents own children.
- Dichotomy w/ and w/o altruism is not key for efficiency. Property rights are!

# $\mathcal{A}-$efficiency and Pareto efficiency

## Proposition

- *If $\underline{b} < b^*$, the equilibrium allocation is $\mathcal{A}$-efficient and $r > n$.*

  $\Rightarrow$ *Pareto efficient*

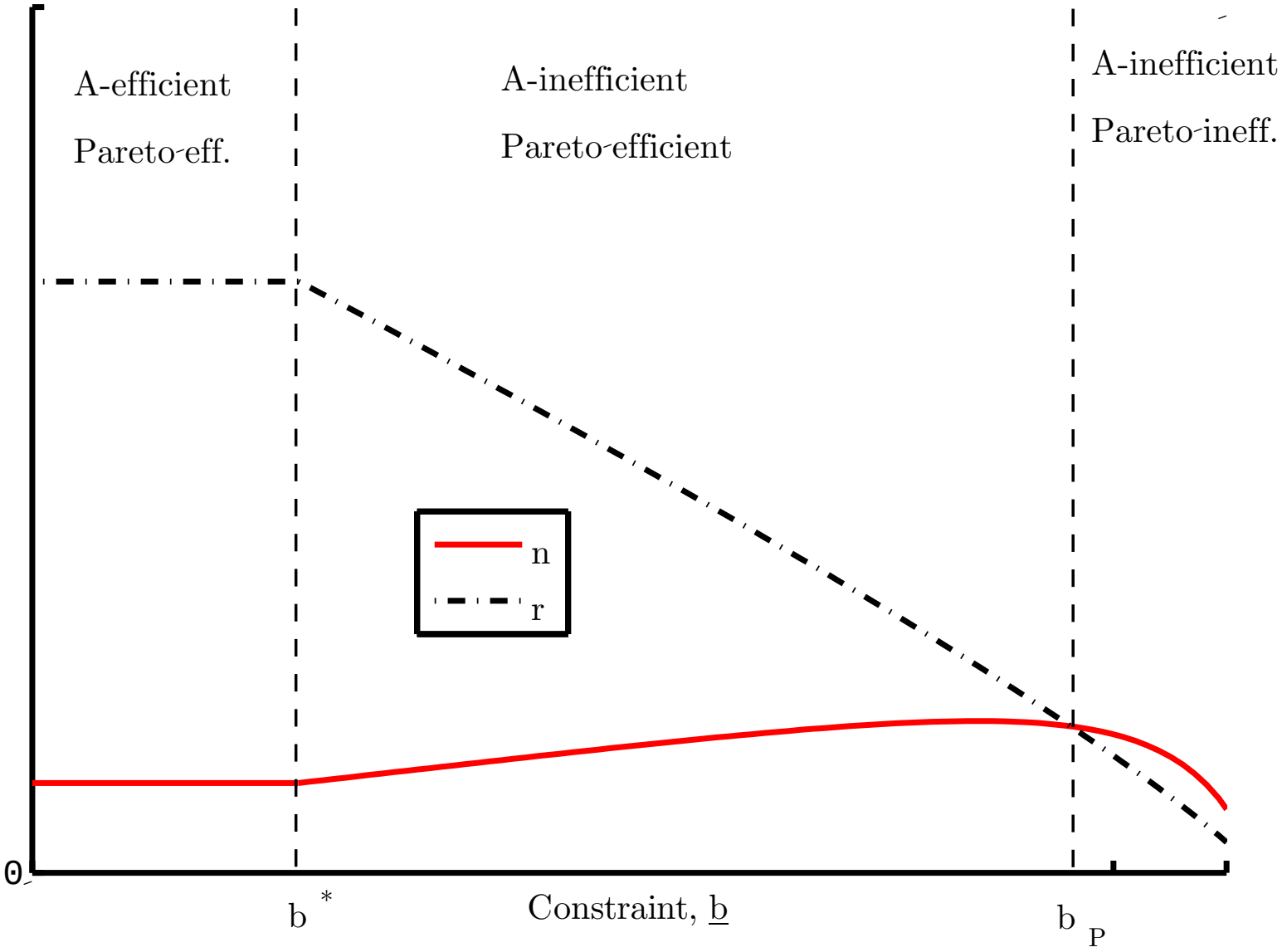
- *Let $\underline{b}_P > b^*$ be such that $\hat{n} = \hat{r}$.*

  *If $\underline{b} > \underline{b}_P$, the equilibrium allocation is Pareto inefficient.*

  $\Rightarrow$ *$\mathcal{A}$-inefficient*

- *If $\underline{b} \in (b^*, \underline{b}_P]$, the equilibrium allocation is Pareto efficient but NOT $\mathcal{A}$-efficient.*

# Steady State Efficiency Results



# Millian Efficiency

## Definition

A symmetric feasible allocation is Millian efficient if there is no other symmetric feasible allocation such that all generations are no worse off and at least one generation is strictly better off.

Used by

- Michel, Wigniolle (2007),
- Conde-Ruiz, Giménez and Pérez-Nievas (2009)

Under what conditions can $\hat{a}$ be dominated by a symmetric allocation?

# $\mathcal{A}-$efficiency and Millian efficiency

## Proposition

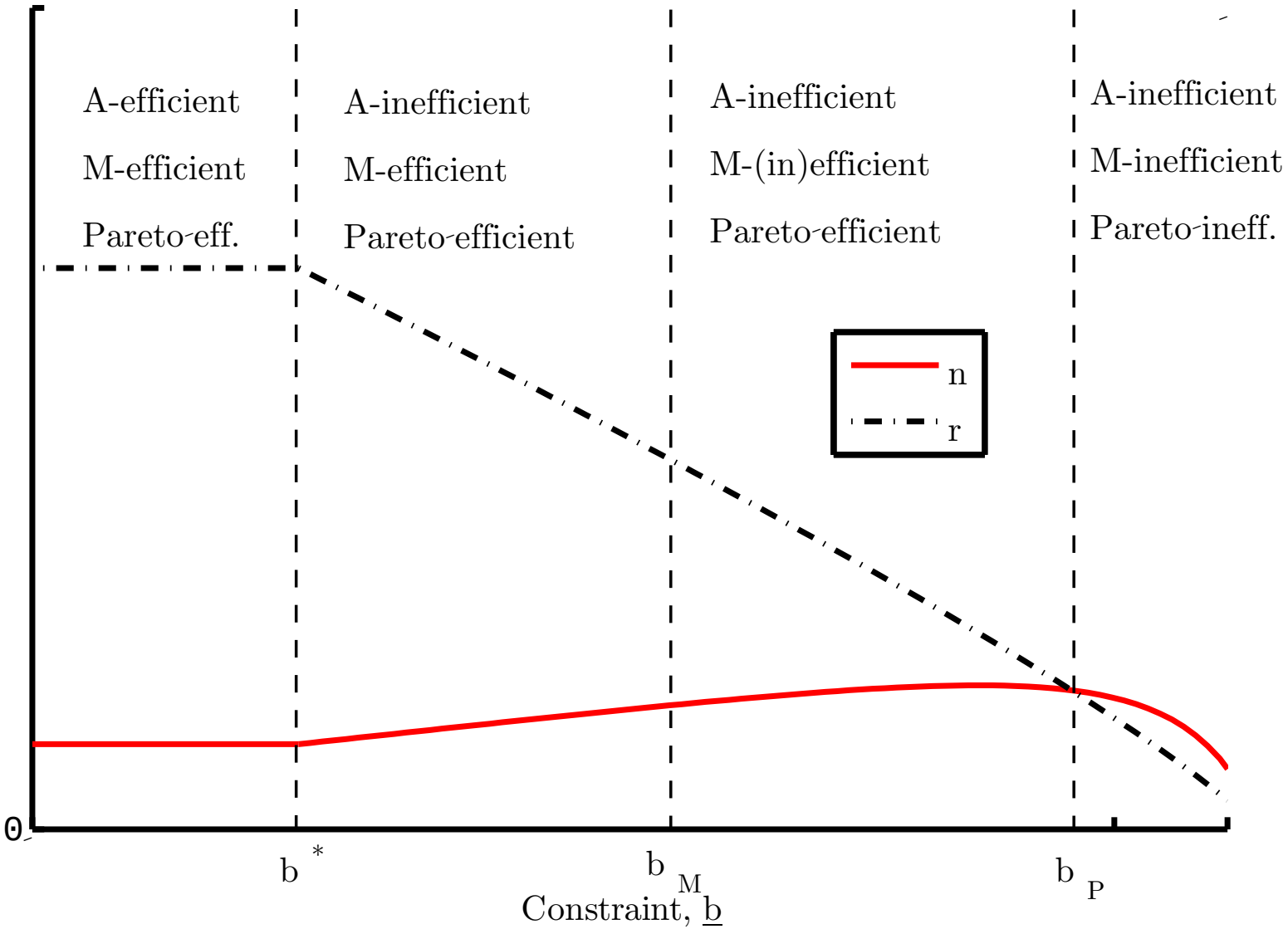
- *If* $\underline{b} < b^*$, *the equilibrium alloc. is* $\mathcal{A}$*-efficient and* $\theta r > w$.

  $\Rightarrow$ *Millian efficient*

- *Let* $\underline{b}_M > b^*$ *be such that* $\theta \hat{r} = \hat{w}$.

  *If* $\underline{b} \in (b^*, \underline{b}_M]$, *the equilibrium allocation is Millian efficient but NOT* $\mathcal{A}$*-efficient.*

# Steady State Efficiency Results



# Policy Implications

1. The introduction of standard PAYG pensions
   - alleviates downward pressure on fertility (at first);
   - relaxes transfer constraint;
   - equilibrium allocation NOT $\mathcal{A}-$efficient.

2. Alternative I: Fertility dependent PAYG pensions (FDPAYG)
   - alleviates downward pressure on fertility;
   - aligns costs and benefits of having children;
   - equilibrium allocation $\mathcal{A}-$efficient.

3. Alternative II: Fertility subsidy and Government debt
   - same as FDPAYG

# PAYG Pension System

Households:

$$\begin{aligned}\max U_t =& u(c_t^m) + \beta u(c_{t+1}^o) + \gamma u(n_t) + \zeta U_{t+1} \\ & c_t^m + \theta_t n_t + s_{t+1} \leq w_t(1 + b_t) - \tau_t \\ & c_{t+1}^o + b_{t+1} w_{t+1} n_t \leq r_{t+1} s_{t+1} + T_{t+1} \\ & b_{t+1} \geq \underline{b}_{t+1}\end{aligned}$$

Gov.ment budget balance: $T_t = n_t \tau_t$

# Efficiency of PAYG Pension System?

Budget constraint:

$$c^o_{t+1} + [c^m_{t+1} + \theta_{t+1} n_{t+1} + s_{t+2} - w_{t+1} + \tau_{t+1}] n_t \leq r_{t+1} s_{t+1} + T_{t+1}$$

- Lump-sum taxes (per person) are not really lump!
- They distort fertility decision (more children = more taxes).
- Parent does not realize that more children also increase $T_{t+1}$.
- Even if constraint not binding: Fertility inefficiently low.

$\Rightarrow$ “Operative transfers” not sufficient with fertility choice

# Alternative I: Pay-out depends on $n$
# $T(n_t) = n_t \tau_t$

Households:

$$\begin{aligned}
\max U_t = & u(c_t^m) + \beta u(c_{t+1}^o) + \gamma u(n_t) + \zeta U_{t+1} \\
& c_t^m + \theta_t n_t + s_{t+1} \leq w_t(1 + b_t) - \tau_t \\
& c_{t+1}^o + b_{t+1} w_{t+1} n_t \leq r_{t+1} s_{t+1} + n_t \tau_{t+1} \\
& b_{t+1} \geq \underline{b}_{t+1}
\end{aligned}$$

- Note that $b$ and $\tau$ enter symmetrically.
  $\rightarrow$ increase $\tau$ increases $b^*$ one for one
- Choose $\tau$ s.t. $b^* \geq \underline{b}$ not binding.
- Allocation is $\mathcal{A}$-efficient.
- Aligns costs and benefits of child-rearing.

# Alternative II: Fertility subsidy and Government debt

Households:

$$\begin{aligned}\max U_t =& u(c_t^m) + \beta u(c_{t+1}^o) + \gamma u(n_t) + \zeta U_{t+1} \\ & c_t^m + \theta_t n_t + (s_{t+1} + d_{t+1}) \leq w_t(1 + b_t) + \tau_t^s n_t - \tau_t^d \\ & c_{t+1}^o + b_{t+1} w_{t+1} n_t \leq r_{t+1}(s_{t+1} + d_{t+1}) \\ & b_{t+1} \geq \underline{b}_{t+1}\end{aligned}$$

Gov.ment budget: $n_{t-1}(d_{t+1} + \tau_t^d) = r_t d_t + n_{t-1}\tau_t^s n_t$

Set $\tau_t^d = \tau_t$.

Set $\tau_t^s = \frac{\tau_{t+1}}{r_{t+1}}$.

$\rightarrow$ same solution as FDPAYG, with $d_{t+1} = \tau_t^s n_t$.

"Ricardian Equivalence"

# Summary

- Document shift in property rights over children
- As constraint becomes binding:
  1. Fertility declines.
  2. Inefficiently low fertility.

  $\longrightarrow$ Coase's Theorem.

  $\longrightarrow$ Property rights and Efficiency in OLG.
- PAYG pensions:
  1. Alleviates downward pressure on fertility
  2. Distorts fertility decision.
  3. Alternatives: Fertility dependent PAYG or
     Fertility subsidy and Gov debt

What's next?

# What's next?

- Analogy investment in children's human capital
- Quantitative importance?
  - How much of a contribution to fertility history in the US?
    - Average decrease, boom and bust? Differential fertility?
  - Which countries experience(ed) inefficiently low fertility?
    - Welfare gains from policy reform?
- Political economy of shift in property rights?
  - Who wanted to pass laws and why?
  - Who was constrained?

# Adding Human Capital

- Parents cannot borrow against children's income and resulting inefficiencies in human capital investment
  $\longrightarrow$ pointed out before in the literature.
- Fernandez and Rogerson (2001),
  Aiyagari, Greenwood, Seshadri (2002),
  Boldrin and Montes (2005), ...
- Focus in literature:
  borrowing constraints in *exogenous* fertility context.

next

# Analogy: Fertility and Human Capital decisions

- Both *e* and *n* are inefficiently low when constraint binding.
- One critical difference:

  costs and benefits of HK investments aligned if *child* makes decisions and credit markets function.
- *Not* possible for fertility decisions

  – a child can never decide to be born!

next

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