Principles of justice, individual responsibility and redistribution behaviors: an experimental investigation

Camille Dorin[1], Vincent de Gardelle[1], Marine Hainguerlot[1], Hélène Huber-Yahi[1,2], Jean-Christophe Vergnaud[1]

[1]CES, Université Paris 1; [2]PSE

Journée de la Chaire Santé
Université Paris Dauphine
24/03/2017

Outline

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Context

- Opinions in terms of fair redistribution depend on the social situation of individuals[1]
- However, most people share some basic principles of justice such as the accountability principle[2]
- People might disagree on what exactly is due to luck and to effort, depending on their social status
- The concept of responsibility is central to theories of fairness[3]: what if its interpretation fluctuates ?

[1] Deffains, Espinosa, and Thöni, 2016.
[2] Konow, 2001.
[3] Fleurbaey, 2008.

Motivation

- Views on redistribution can be shaped by self-interest, individual preferences, but also economic experience
- The well-known Self-Serving Bias is often put forward as the likely channel from economic experience to redistribution choices[4]: is it really ?
- Self Deception, Social Image or Social Group Preferences are alternative channels

[4] Deffains, Espinosa, and Thöni, 2016.

Our contribution

- Goal: to investigate how economic experience can shape redistribution preferences
- Method: controlled experiments in a laboratory
- Various competing theories are tested

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Self-Serving Bias (1)

- Most popular mechanism
- SSB is a self-serving *attributional* bias regarding the determinants of task outcome[5]
- If success, self-enhancing attribution: subject will congratulate herself for her efforts *(internal factors)*
- If failure, self-protecting attribution: subject will blame the situation *(external factors)*
- SSB is a motivated belief

[5] Miller and Ross, 1975.

Self-Serving Bias (2)

- SSB is often evidenced in relation with economic experience (success or failure) and redistribution decisions[6]
- Evidence: Status $\Rightarrow$ SSB and Status $\Rightarrow$ Redistribution choices
- However, does that mean that:
  Status $\Rightarrow$ SSB $\Rightarrow$ Redistribution choices ?
- Plus, the impact of status on redistribution choices might be mediated by various other mechanisms
- Root: concept of Cognitive Dissonance[7]

[6] Deffains, Espinosa, and Thöni, 2016.
[7] Festinger, 1957.

Cognitive Dissonance

Psychological conflict resulting from
incongruous beliefs and attitudes held simultaneously[8]

- E.g. believing in fairness principles while choosing an unfair allocation rule
- Individuals do not tolerate very well Cognitive Dissonance, and will strive to redeem internal consistency
- Self-Serving Bias is just *one* way of achieving a reduction of this Cognitive Dissonance

[8] Merriam-Webster

Outline

Mechanisms investigated

- Self-Serving Bias (Miller and Ross, 1975)
- Self-Deception (Konow, 2000)
- Social Image (Andreoni and Bernheim, 2009)
- Group Identification (Klor and Shayo, 2010)

Self-Serving Bias and redistribution

- Subjects distort their interpretation of the sources of inequality: a deprived individual will perceive that the main determinant of inequalities is luck, while a wealthy person will invoke effort
- So, successful individuals sincerely believe that in accordance with the accountability principle, no redistribution should take place
- Individuals can sincerely adhere to the accountability principle while preserving their self-interest

Self-Deception and redistribution

- Cognitive Dissonance reduction is operated through a *change* in one's views on social justice principles
- Goal: to make self-interest more in line with normative preferences
- Individuals sincerely believe that this new set of values is fair
- So the deprived will hold strong views in favor of egalitarianism, whatever the determinants of inequalities, while the wealthy will argue for *Laissez-faire*

Social Image and redistribution

- The accountability principle is a social norm
- Individuals might not care at all for this principle
- Their only goal might be only to *look* fair, while caring about their self-interest only
- So to justify their actions in terms of redistribution, they will *unsincerely* report beliefs about the determinants of inequalities
- A deprived person will unsincerely invoke bad luck to benefit from the accountability principle

Self-Serving Bias and Social Image thus give way to identical predictions in terms of stated beliefs about the role of luck vs. effort

Group Identification and redistribution

- Individuals might implement principles of justice only towards their fellow group members
- The poor might want high transfers from the rich to the poor just because they prefer the poor, same for the rich
- Even when favoring one's group is costly

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Setting (1)

Starting point: experimental paradigm of Deffains, Espinosa, and Thöni, 2016

- Subjects are assigned a computerized effort task where performance determines profit
- Task: count the number of 1's in various sequences of 0's and 1's of variable length
- Feedback: informed if performed above median (Overachievers) or below median (Underachievers)
- They know level of difficulty was randomly assigned (easy or difficult)
- But they *don't know* the level they were assigned to
- ⇒ They face ambiguity as regards the respective roles of luck and effort in their profit

Setting (2)

- Perfect correspondence between task difficulty and status
- In each session, all subjects assigned to the easy task ended up as Overachievers (O)
- And all subjects assigned to the difficult task ended up as Underachievers (U)
- Status O or U is thus exogenously manipulated

Outline

Design (1)

1. Task completion and determination of status: O or U
2. Questionnaire on subjective determinants of outcome (internal or external factors)
3. Disinterested dictator game (redistribution choices between a poor target and a rich target in the room)
4. Same as above knowing status of targets (OO, UU, OU)
5. Interested dictator game (redistribution choices between oneself and a richer/poorer target in the room)

Steps 1 to 3 are a replication of Deffains, Espinosa, and Thöni, 2016

Design (2)

6. Elicitation of beliefs on difficulty and performance: stated and revealed (incentivized)
7. Elicitation of redistribution preferences (hypothetical castaway scenarios)
8. Opinion questionnaire
9. Payment: effort task + potential redistribution (1/3) or revealed belief (2/3)

Sessions have been run so far on 100 subjects.

Dictator game and scenarios

- Dictator game[9]: the first player, the "dictator", determines how to split an endowment between himself and the second player, who is passive
- Castaway scenario[10]: Bob and John are identical in terms of physical and mental abilities. They become shipwrecked on an unhabited island where the only food is bananas. They can pick as many bananas as they want by climbing up a tree.
- Bob picks 12 bananas per day and John 6 per day.
- Luckily, John gets 2 extra bananas that have fallen from the tree.

[9] Kahneman, Knetsch, and Thaler, 1986.
[10] Konow, 2001.

Scenarios: ratings

Bob picked 12 bananas, John picked 6 and got 2 "for free".

At the end of the day, they decide to split the bananas. How fair do you rate the following propositions ?
(from totally unfair to totally fair, 7 levels)

1. Each keep the bananas he picked and they share equally the bananas fallen from the tree (Bob: 13 ; John: 7)
2. They share equally all the bananas (Bob: 10 ; John: 10)
3. Each keep the bananas he got (Bob: 12 ; John: 8)

Outline

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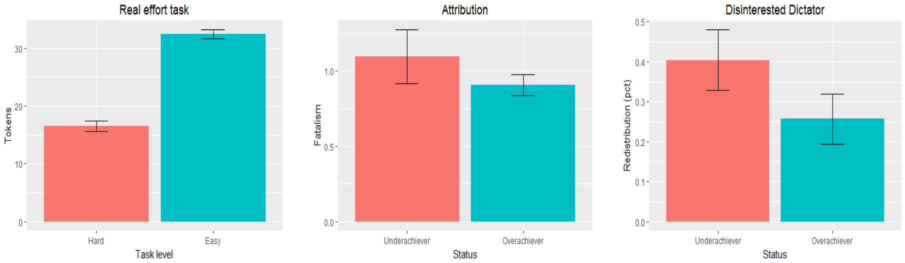
Status and SSB (1)

We replicate results by Deffains, Espinosa, and Thöni, 2016:

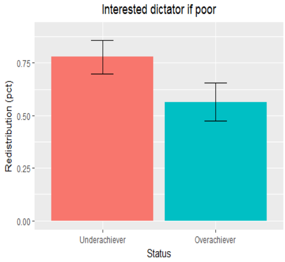
- Task difficulty determines status
- $Fatalism\ Ratio = \frac{\sum external\ \ factors}{\sum internal\ \ factors}$ higher for U's than for O's
- Disinterested dictator: U's redistribute more than O's

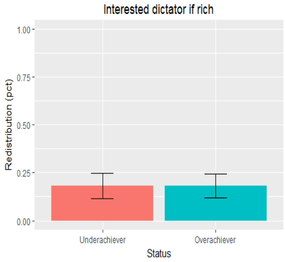


Status and SSB (2)

Additional result: interested dictator

- If poorer than partner: O's redistribute less than U's
- O's will claim less tokens than U's ⇒ stable decisions
- If richer than partner: lower redistribution, no difference between O's and U's





Status and SSB (3)

In addition to the *Fatalism Ratio*, we compute other measures likely to capture SSB:

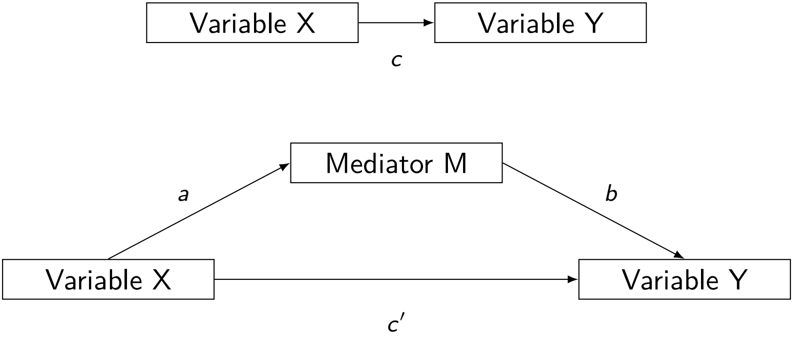
- $F_{int} = \sum$ *internal factors*: significantly greater for O's than U's (16.3 vs. 11.6)
- Belief in luck $P(O|E, L)$[11]: significantly greater for U's than O's (0.53 vs. 0.18)

Evidence of SSB ; however, no proof yet that the effect of status on redistribution choices is channeled by SSB.
Only F_{int} is correlated to redistribution choices in disinterested dictator game ⇒ mediation analysis[12]

[11] Probability that they can be overachievers (O) given that the task level was easy (E) but that their relative performance within their difficulty group was low (L)

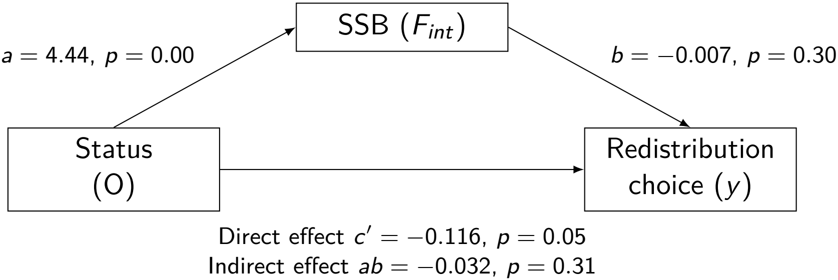
[12] Sobel, 1982.

Mediation analysis: presentation



3 regressions: $Y = \alpha_1 + cX + \varepsilon_1$; $M = \alpha_2 + aX + \varepsilon_2$;
$Y = \alpha_3 + bM + c'X + \varepsilon_3$
Total effect (c) = direct effect (c') + indirect effect (ab)

SSB: mediation analysis



The impact of status on redistribution choices is not channeled by SSB

Outline

Social Image measures

After task completion and once status is known:

- Stated: difficulty level they think they faced (Easy or Difficult)
- Given this stated level group, whether they think they were O's in this group
- Then asked to bet on their answers[13]

No significant difference between stated and revealed beliefs: subjects are likeky to be sincere. No evidence of Social Image.

[13] Subjects must choose how they will get their payment: either by betting on their answer (they get a payment if they were right, and no payment if not), or by choosing a given lottery (6 choices proposed)

Outline

Group Preference measures

After task completion and once status is known:

- Disinterested dictator games where target statuses are known (OO, UU, OU)
- Measure: $GP = \frac{y_{OO}+y_{UU}}{2} - y_{OU}$
- GP is significantly higher for O's than U's
- However, GP is not correlated to the redistribution decisions in the disinterested dictator game

No evidence of Group Preference as a mechanism.

Outline

Self-Deception

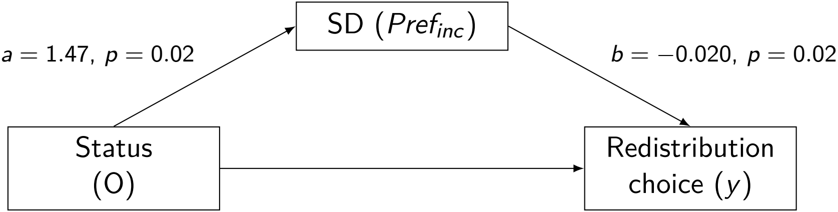
Are fairness beliefs distorted by status knowledge?

- Castaway scenarios: fairness ratings of systems *(laissez-faire, egalitarian, social-liberal)*
- Measures: score of *laissez-faire* (LF) and LF *minus* score of *egalitarian* ($LF - E$)
- Preference for incentives vs. equalization of incomes ($Pref_{inc}$)
- All 3 measures correlate as expected with status: LF and $Pref_{inc}$ higher for O's, ($LF - E$) higher for U's

Only $Pref_{inc}$ mediates the impact of status on redistribution decisions.

Evidence: the impact of status on redistribution decisions is channeled by beliefs on fairness, that have been distorted by status knowledge.

SD: mediation analysis



Direct effect $c' = -0.118,\ p = 0.02$
Indirect effect $ab = -0.029,\ p = 0.09$

Conclusion

- Views on redistribution are shaped by economic experience
- Our results suggest that subjects change their fairness principles according to their self-interest
- This is likely to stem from an attempt to reduce the cognitive dissonance due to a gap between fairness principles and self-interest
- We found evidence of Self-Serving Bias, consistently with previous literature
- Although Self-Serving Bias was likely to channel the impact of status on redistribution choices, our results do not support this hypothesis

Outline

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Drugs, Show-Rooms and Financial Products: A Theory of Competing Experts

D. Bardey	D. Gromb	D. Martimort	J. Pouyet
U. Los Andes	HEC-Paris	PSE (EHESS)	PSE (CNRS & ENS)

Journée de la Chaire Santé - March 2017

Motivation: Drugs markets and pharmacists

Prescription Drugs markets and pharmacists

- Pharmaceutical sector subject to price regulation and restriction on competition
- Community pharmacists detect drugs interactions and side-effects
- Pharmacists are expert who provide valuable information
- Arrêté of November 2014 compensate pharmacists for their advising role
- But restrictions on competition may also reflect vested interest to protect rents associated to market power

Non-prescription Drugs markets and pharmacists

- No price regulation
- Price of a non-prescription drug varies from one to four (France)
- Dispersion may be explained by differences in the cost of purchasing these drugs from pharmaceutical companies
- Differences may lead to a biased recommendation from pharmacists to favor higher-margin drugs

Motivation: E-commerce and ‘Showrooming’

Snowsport industry

- Some brick-and-mortar shops offer expert advice
- But the temptation to go online is strong
- Some retailers charge customers 50$ as a ‘fitting fee’, refunded in they buy in-store and do not ‘change room’

Issue applies to many other industries as well

- Bookstore owners suspect that customers who type into their smartphones while browsing in the store, and then leave, are planning to buy the books online later. 39% of people who bought books from Amazon said they had looked at the book in a bookstore before buying it from Amazon.
- Some retailers suggested that suppliers create special products that would set them apart from competitors and shield it from the price comparisons
- Others are planning to match the prices of Internet competitors
- Does competition hinder the provision of expert advice? Is some regulation necessary?

Motivation: Let us step back

Buyers often rely on sellers for expert advice

- Pharmacists advise clients on which non-subscription drugs to use
- Retailers of high-tech products often educate customers
- Bankers advise clients on investment opportunities
- Situation prone to conflicts of interests because sellers have private information on their margins

Two views on competition/regulation

- Lack of competition $\Rightarrow$ sellers slack on the provision of advice?
- Too much competition $\Rightarrow$ lower the sellers' incentives to offer expert advice?
- How competition and regulation affect sellers' provision of expert advice to buyers

Analysis: a market for experience good where sellers (i) may collect info about the buyers' needs (ii) may be biased towards some of the products (iii) different forms of competition regulation are considered

Model

3 key elements

1. Buyer has needs for a specific product
2. Seller collects info about the best product for the buyer, but this is costly: moral hazard
3. Seller may be biased towards some product, but this is unobservable: adverse selection

Model

Key element 1: buyer looks for the right product

- Buyer's needs: $\theta \in \{A, B\}$, θ unknown, prior $\Pr(\theta = A) = \Pr(\theta = B) = \frac{1}{2}$
- Two products available, A or B
- Buyer gets surplus v from the product if the product matches his needs and gets 0 otherwise
- Buyer demands one unit at most and the value v is distributed according to a cdf $F(\cdot)$ on $[0, \overline{v}]$:
  - Buyer with need θ buys if seller recommends product θ and if $v \geq p_\theta$
  - Correct recommendation boosts sales
  - Demand $D(p_i) = 1 - F(p_i)$, surplus $S(p_i) = \int_{p_i}^{\overline{v}} (v - p_i) dF(v)$
  - Buyer surplus is the same for both products

$\rightarrow$ Buyer buys only when the seller makes the correct recommendation

Model

Key element 2: seller provides an expert recommendation

- Info collection about the buyer's needs: at cost ψ, seller obtains a signal σ correlated with θ
- Signal's precision is the proba that the seller's recommendation matches the buyers' needs

$$\varepsilon = \Pr(\sigma = A \mid \theta = A) = \Pr(\sigma = B \mid \theta = B) > \frac{1}{2}$$

- Info-collection decision and realization of the signal are unobservable: moral hazard on the seller's side

$\rightarrow$ Info collection by the seller improves the likelihood of a sale but is costly: moral hazard

Model

Key element 3: expertise may be biased

- different products have different margins
- marg. cost of good B is known and equal to c
- marg. cost of good A is equal to either c or $c - \Delta c$ with proba $(1 - \nu, \nu)$, and is the seller's private information
- low (high) cost seller is a seller with $c_A = c - \Delta$ ($c_A = c$)

$\rightarrow$ A low-cost seller who remains uninformed about the buyer's needs is biased towards selling good A which has a higher expected margin a priori

Social optimum

Two decisions

- pricing: at marginal cost ($p_\theta = c_\theta$) to maximize welfare ($W^*(c_\theta)$)
- information collection

No info collected

- buyer purchases good A as its cost is weakly lower
- expected welfare

$$\Pr(\theta = A)\, W^*(c_A) + \Pr(\theta = B)\, 0$$

Info collected

- expected welfare

$$\sum_{\{i,j\}=\{A,B\}} \Pr(\theta = i)\, [\Pr(\sigma = i \mid \theta = i)\, W^*(c_i) + \Pr(\sigma = j \mid \theta = i)\, 0] - \psi$$

Assumption: Information collection is socially desirable for all c_A

$$\underbrace{\frac{\varepsilon}{2} W^*(c_B)}_{\text{better match when } \theta = B} - \underbrace{\frac{(1-\varepsilon)}{2} W^*(c_A)}_{\text{mismatch when } \theta = A} \geq \underbrace{\psi}_{\text{effort cost}}$$

Implementable profits

Two steps

1. characterize seller's profits on good A and good B such that the seller has incentives to collect information and to reveal it truthfully to the buyer
   - abstract but useful preliminary step
   - keep in mind that profits come from the competitive and regulatory environment
2. study the unregulated monopoly case

1. **The cone of implementable profit**
   - let $\pi_A(c_A)$ and $\pi_B(c_A)$ be some profits when seller makes a recommendation which matches the buyer's needs
   - seller has incentives to collect and reveal info iff

$$\underbrace{\frac{\varepsilon}{2}\pi_A(c_A)+\frac{\varepsilon}{2}\pi_B(c_A)-\psi}_{\substack{\text{effort}\\ \text{truthful recommendation}}} \geq \underbrace{\max\left\{\frac{\pi_A(c_A)}{2},\frac{\pi_B(c_A)}{2}\right\}}_{\substack{\text{no effort}\\ \text{recommendation of most profitable product}}}$$

   - such profits $\{\pi_A(c_A),\pi_B(c_B)\}$ define a cone

1. The cone of implementable profit: Graphical representation

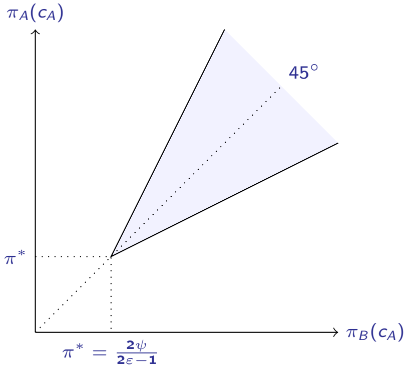


Figure: Profits $\{\pi_A(c_A), \pi_B(c_B)\}$ which lie inside the cone provide the seller with the incentives to collect and reveal truthfully the signal on the buyer's needs.

2. Unregulated monopoly: prices and info collection

- Timing
  (1) seller learns c_A and chooses p_A and p_B
  (2) seller chooses whether to collect info and recommends a good
  (3) buyer buys if advice matches needs.
- Monopoly outcome

$$p^m(c) = \arg\max_p (p - c)D(p)$$

$$\pi^m(c) = \max_p (p - c)D(p)$$

- Info collection is optimal iff

$$\frac{\varepsilon}{2}\pi^m(c_B) - \frac{(1-\varepsilon)}{2}\pi^m(c_A) \geq \psi$$

- Assumption: At the unregulated monopoly outcome, only the high-cost seller collects information and reports truthfully

$$\underbrace{\frac{\varepsilon}{2}\pi^m(c) - \frac{(1-\varepsilon)}{2}\pi^m(c) - \psi}_{\text{high-cost seller collects info}} \geq 0 \geq \underbrace{\frac{\varepsilon}{2}\pi^m(c) - \frac{(1-\varepsilon)}{2}\pi^m(c - \Delta c) - \psi}_{\text{low-cost seller collects info}}$$

2. Unregulated monopoly: Graphical representation

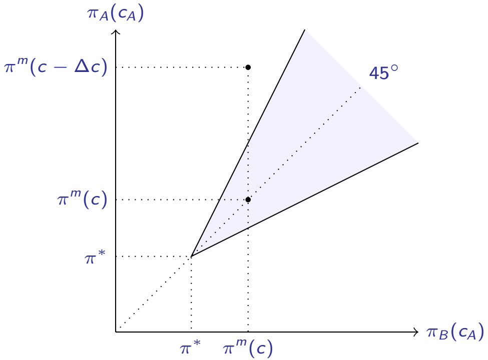


Figure: A high-cost seller ($c_A = c$) has incentives to collect and reveal truthfully; a low-cost seller ($c_A = c - \Delta c$) does not collect and recommends A

2. Unregulated monopoly: Equilibrium

Proposition

At the unique perfect Bayesian equilibrium

- the seller charges monopoly prices for both goods: $p_A = p^m(c_A)$ and $p_B = p^m(c_B)$
- a high-cost seller collects information and offers truthful advice
- a low-cost seller remains uninformed and recommends good A

$\rightarrow$ Does competition/regulation boost the seller's incentives to collect info and reduce market power?

Competition

Two forms of competition

- Ex ante competition: buyer chooses either one of two sellers, then sticks to its advice
  - $\rightarrow$ Sellers cannot free-ride on each other's advice
- Ex post competition: following the recommendation obtained from a seller, buyer can switch to a different seller
  - $\rightarrow$ Sellers can free-ride on each other's advice
- Different assumptions about switching costs

Ex ante competition

Hotelling with multiple products

- Two identical sellers, 1 and 2, located at the extremes of $[0, 1]$
- Unit mass of buyers distributed on $[0, 1]$, each buyer has a value v drawn from cdf $F(\cdot)$
- Transport cost t (inverse proxy for competition intensity)

Timing

- Buyers choose first one of the two sellers
- Sellers then decide whether to gather info

Ex ante competition

Step 1: Sellers' demands

- A buyer located in $x \in [0,1]$ buys from seller 1 rather than from seller 2 iff

$$\frac{\varepsilon}{2} S(p_{A1}) + \frac{\varepsilon}{2} S(p_{B1}) - tx \geq \frac{\varepsilon}{2} S(p_{A2}) + \frac{\varepsilon}{2} S(p_{B2}) - t(1-x)$$

- Ex ante market share faced by seller i: $\mathcal{D}_i(p_{A1}, p_{B1}, p_{B1}, p_{B2})$.

Step 2: Work with ex post profits rather than prices

- Define $P(c, \pi)$ such that

$$\pi = (P(c,\pi) - c)\, D\,(P(c,\pi))$$

- Ex ante profit of seller i expressed in terms of profits $\{\pi_{Ai}, \pi_{Bi}\}$

$$\left(\frac{\varepsilon}{2}\pi_{Ai} + \frac{\varepsilon}{2}\pi_{Bi} - \psi\right) \mathcal{D}_i(\pi_{A1}, \pi_{B1}, \pi_{A2}, \pi_{B2})$$

Step 3: Locus condition

- FOCs at symmetric equilibrium $\{\pi_A, \pi_B\}$ in which sellers collect information

$$\frac{(P(\pi_A, c_A) - c_A)D'(P(\pi_A, c_A))}{D(P(\pi_A, c_A))} = \frac{(P(\pi_B, c) - c)D'(P(\pi_B, c))}{D(P(\pi_B, c))} \quad \text{(Locus)}$$

- traduce a form of complementarity between products to attract buyers

Wrapping-up: Whatever the degree of ex ante competition (t), for an equilibrium in which sellers exert collect info to merge, profits $\{\pi_A, \pi_B\}$ must be such that

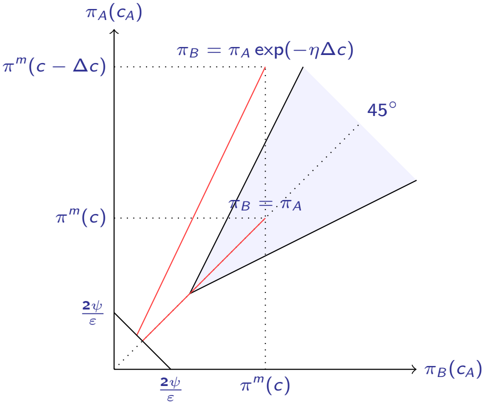
(i) (Locus) is satisfied

(ii) they lie within the implementability cone

Ex ante competition

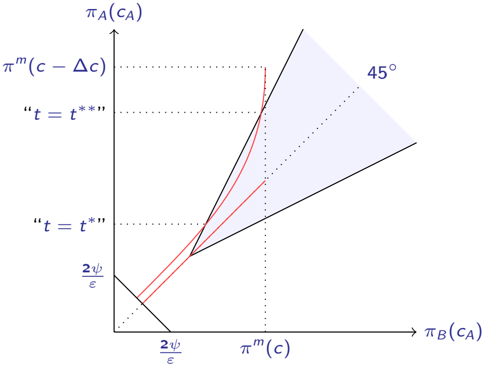
- For a high-cost seller ($c_A = c = c_B$), locus coincides with 45°-line
- With an exponential distribution, for a low-cost seller ($c_A = c - \Delta c < c_B$) the locus is a straight line which never enters the implementability cone
- As ex ante competition increases, profits 'move down' the locus conditions

→ **With exponential distribution, ex ante competition does not improve the low-cost seller's incentives to collect info**



Ex ante competition

- With other distributions, moderate competition may allow to boost the low-cost seller's incentives to collect info
- Competition should erode profits more on good A than on good B



Proposition

Assume

$$\max_{\{\pi(c-\Delta c),\pi(c)\}\in(\mathbf{Locus})} \frac{\varepsilon}{2}\pi(c) - \frac{1-\varepsilon}{2}\pi(c-\Delta c) > \psi$$

Then, two thresholds t^* and t^{**} exist (with $t^{**} > t^* > 0$) such that the sellers gather and reveal information in a symmetric equilibrium if and only if $t \in [t^*, t^{**}]$.

Ex post competition

Framework

- Starting point: unregulated monopoly
- After receiving the recommendation by the seller, the buyer can switch to the cheapest of n non-strategic rivals
- Ex post competition on good A only
- Demand faced by the seller on product A writes now as $D(p, n)$

$\rightarrow$ Possibility to switch to a more competitive supplier but only if the recommendation is correct

Competition vs. free-riding

- Free-riding in the provision of advice increases with the intensity of competition
- Yet, competition may bring both profits in the implementability cone

Ex post competition

Proposition

- A low-cost seller collects and reveals his information iff $n \in [n^{*}, n^{**}]$
- A high-cost seller collects information if $n \leq n^{***}$ and remains uninformed and recommends good B otherwise
- $\max\{n^{*}, n^{***}\} \leq n^{**}$

Provided that it is asymmetric and moderate, competition can promote truthful advising even if rivals free ride on advice provision

Regulation

Competition may fail to induce info collection because sellers lack instruments to both extract surplus and preserve incentives: unit prices play both roles

Regulator can use additional instruments (fixed fees) but faces moral hazard and adverse selection

Roadmap

- Moral hazard only
  - prices equal to marg cost to maximize welfare
  - fees need to ensure info collection
  - dichotomy between pricing and info gathering incentives
- Moral hazard and adverse selection
  - Low-cost seller can mimick a high-cost one and earns a information rent
  - Prices used to limit these rent

Regulation

Contracts

- based on reports of cost $\hat{c}_A$ and signal $\hat{\sigma}$
- specify prices p for both goods, fixed payment $T \geq 0$ in the event of a good match

Objective: customer's expected net surplus

$$\frac{\varepsilon}{2} \sum_{\sigma \in \{A,B\}} S(p_\sigma(c_A)) - T_\sigma(c_A) = \frac{\varepsilon}{2} \sum_{\sigma \in \{A,B\}} W(c_\sigma, p_\sigma(c_A)) - \pi_\sigma(c_A)$$

Regulation: Moral hazard only

Moral hazard only

- (c_A, σ) known, effort to collect info is not
- Profits earned by the seller must lie within the cone

$$\frac{\varepsilon}{2}\pi_A(c_A) + \frac{\varepsilon}{2}\pi_B(c_A) - \psi \geq \max\left\{\frac{\pi_A(c_A)}{2}, \frac{\pi_B(c_A)}{2}\right\}$$

$\rightarrow$ Suggests to set prices to marginal cost in order to maximize welfare and set fixed payments to ensure info collection

Regulation: Moral hazard only

Proposition (Optimal regulation under moral hazard only)

Suppose cost c_A is common knowledge. Then

- Both goods are priced at marginal cost
- Profits and fixed fees are constant across goods

$$\pi_\sigma(c_A) = T_\sigma(c_A) = \pi^* = \frac{2\psi}{2\varepsilon - 1}, \quad \forall (c_A, \sigma)$$

- Information gathering is induced by the regulator when

$$\frac{\varepsilon}{2} W^*(c) - \frac{(1-\varepsilon)}{2} W^*(c - \Delta c) \geq \psi + \underbrace{\frac{\psi}{2\varepsilon - 1}}_{\text{limited liability rent}}$$

Since the seller cannot be punished in the event of a mismatch, regulation must give up a rent to ensure info collection

Regulation: Moral hazard and adverse selection

Seller has private information about his cost for good A

- this information has no value in an unregulated context because it does not affect the buyer's utility...
- ...but it has value in a regulation context: manipulating information revelation on the cost structure to a regulator becomes a way for the seller to channel customers towards the informationally sensitive good that provides information rent

→ Private information impacts on incentives for information gathering

Incentives to lie on margin and shirk on info collection effort

- start from the optimal contract under moral hazard only
- consider a low-cost seller who makes no effort and reports a high cost
- this does not change the fees but brings an extra gain

$$\underbrace{\frac{1}{2}}_{\text{prior with no effort}} \underbrace{\Delta c}_{\text{cost-saving}} \underbrace{D(c)}_{\text{demand for good } B \text{ at reulated price}} > 0$$

Regulation: Moral hazard and adverse selection

A low-cost seller's "triple-deviation" incentive constraint

$$\begin{array}{c}\text{report cost truthfully}\\ \text{gather info}\\ \text{give truthful advice}\end{array} \geq \begin{array}{c}\text{inflate cost}\\ \text{remain uninformed}\\ \text{recommend good } A\end{array} \Leftrightarrow \mathcal{U}(\underline{c}_A) \geq \frac{\pi_A(\overline{c}_A)}{2} + \frac{\Delta c}{2} D(p_A(\overline{c}_A))$$

Recommending good A must be less attractive

- reducing a high-cost seller's fixed fee for selling good A
  - might bias a high-cost seller towards good B
  - requires increasing the reward for good B and thus a high-cost seller's reward for gathering information
- increasing good A's price to lower demand

→ trade-off between decreasing a low-cost seller's information rent and increasing a high-cost seller's liability rent

Proposition

The optimal contract is such that:

- both seller types charge prices equal to marginal cost for good B
- a low-cost seller charges a price equal to marginal cost for good A while a high-cost seller charges a price above marginal cost for that good
- a high-cost seller makes the same profits on each good than when cost is common knowledge
$$\pi_A^{sb}(\overline{c}_A) = \pi_B^{sb}(\overline{c}_A) = \pi^*$$
- a low-cost seller's profits on each good can be chosen equal but greater than when cost is common knowledge
$$\pi_A^{sb}(\underline{c}_A) = \pi_B^{sb}(\underline{c}_A) = \pi^* + \frac{1}{2\varepsilon}\Delta c D(p_A^{sb}(\overline{c}_A)) > \pi^*$$

$\rightarrow$ An optimal contract must afford a low-cost seller an extra rent to shift profits inside the cone

Regulation: Moral hazard and adverse selection

Like competition, regulation has a difficult time eliminating price distortions (induced by private information, not market power) while inducing information gathering

Under adverse selection, a tension appears between the traditional information rent that induces price distortions and information gathering

Buyer-seller dynamics

Experience goods are usually 'experienced' through repeat purchases

A buyer can use retrospective rules to control the seller

Relevant to the analysis of the physician-patient relationship

Dynamic issue modeled as follows

- an infinitely repeated trading relationship
- the seller's cost c_A is time-invariant
- the buyer's types θ_t in different periods t are i.i.d.
- δ is the discount factor

In each period

- the seller must (i) learn which good is the best match with the buyer's preferences (at cost ψ) and (ii) choose the prices charged for both goods
- the buyer can switch (at some cost) to a symmetric rival seller

Buyer-seller dynamics

Assume the buyer commits to probabilities of dropping the seller following a good or bad match (β and γ)

Some resemblance with regulation setting

- continuation payoff plays the role of the fee in a regulatory setting
- that the buyer adopts a retrospective rule to retain the seller or not resembles the commitment power given to the regulator

$\rightarrow$ Although the control of the seller by retrospective buyers is an imperfect substitute for regulation, it exhibits similar patterns

Buyer-seller dynamics: Moral hazard only

Continuation value for the seller with cost c_A on the equilibrium path

$$\text{Continuation value} = \max_{(p_A,p_B)} \begin{array}{c}\text{buyer's need is } A\\ \text{recommendation is correct}\\ \text{buyer stays with prob } \beta_A\end{array} + \begin{array}{c}\text{buyer's need is } A\\ \text{recommendation is incorrect}\\ \text{buyer stays with prob } \gamma_A\end{array}$$
$$+ \begin{array}{c}\text{buyer's need is } B\\ \text{recommendation is correct}\\ \text{buyer stays with prob } \beta_B\end{array} + \begin{array}{c}\text{buyer's need is } B\\ \text{recommendation is incorrect}\\ \text{buyer stays with prob } \gamma_B\end{array} - \psi$$

or

$$\mathcal{U}(c_A) = \max_{(p_A,p_B)} \frac{\varepsilon}{2}\left((p_A - c_A)D(p_A) + \delta\beta_A(c_A)\mathcal{U}(c_A)\right) + \frac{1-\varepsilon}{2}\delta\gamma_A(c_A)\mathcal{U}(c_A)$$
$$+ \frac{\varepsilon}{2}\left((p_B - c)D(p_B) + \delta\beta_B(c_A)\mathcal{U}(c_A)\right) + \frac{1-\varepsilon}{2}\delta\gamma_B(c_A)\mathcal{U}(c_A) - \psi$$

Buyer-seller dynamics: Moral hazard only

Incentives for information gathering (one-shot deviation)

$$\mathcal{U}(c_A) \geq \max\{\underbrace{\frac{1}{2}\pi^m(c_A) + \frac{\delta}{2}(\beta_A(c_A) + \gamma_A(c_A))\mathcal{U}(c_A)}_{\substack{\text{no info collection} \\ \text{recommends good } A \\ \text{continue with gathering and revealing}}},$$

$$\underbrace{\frac{1}{2}\pi^m(c) + \frac{\delta}{2}(\beta_B(c_A) + \gamma_B(c_A))\mathcal{U}(c_A)\}}_{\substack{\text{no info collection} \\ \text{recommends good } B \\ \text{continue with gathering and revealing}}}$$

Buyer-seller dynamics: Moral hazard only

Quitting as an incentive device

- buyer uses (costly) quitting to induce information gathering
- no problem in continuing with a high-cost seller since this type provides advice in a static relationship
- with a low-cost seller biased in a one-shot relationship towards good A, make continuation after a wrong recommendation for good A less likely

$\rightarrow$ threat of quitting is akin to lowering the stage-profit for good A

$\rightarrow$ such an asymmetry in the seller's forthcoming profits provides incentives to gather information

Quitting as a screening device

- buyer now wants to avoid that a low-cost seller unduly recommends good A without having collected information while charging the same price as a high-cost seller for that good and pocketing thereby some information rent
- relationship should now be also terminated with some probability following a high price for and a recommendation for good A even if this is indeed the choice that would be made by a high-cost seller who has gathered information

Buyer-seller dynamics: Moral hazard and adverse selection

Comparison with the Optimal Regulation

- Regulator and buyer are concerned with the low-cost seller's incentives to mimic a high-cost seller, charge high prices and recommend good A
- Buyer has no control on prices and fees are limited to be equilibrium continuation values.
- Only tool is to stop the relationship
- Relaxing the low-cost seller's incentive constraint requires
  - to terminate more often the relationship if a high price is charged for good A
  - to terminate this relationship less often in case good A is recommended and a low price is charged for that good although such distortion is necessary in a pure moral hazard environment

Conclusion

Ex post competition on good A and Buyer-seller dynamics: some competition is beneficial as it disciplines the seller on the good where it has a high margin

Ex ante competition: buyers are more passive, competition erodes profits symmetrically and may fail to improve incentives for info collection.

When competition fails, regulation may help... but comes with its own curse due to the rents associated to moral hazard and adverse selection which generate distortions.

In progress

- unified framework for ex ante and ex post competition
- possibility to gather several recommendations

Is there a retirement health care utilization puzzle? Evidence from SHARE data in Europe

Eve Caroli [1] Claudio Lucifora [2] Daria Vigani [3]

[1]PSL-Paris Dauphine University, PSE and IZA

[2]UCSC and IZA

[3]UCSC

Health Chair

Paris Dauphine University, March 24th, 2017

Motivation

Retirement is associated with significant changes in lifestyles and behaviors.

The literature has evidenced unexpected jumps in health status and consumption around the age of retirement.

- Hard to reconcile with life-cycle theory.
- Debate as to whether health investments and consumption should vary smoothly over the life cycle or experience discontinuities at the time of retirement.

$\longrightarrow$ In this paper, we investigate the existence of a discontinuous change in health investment at the time of retirement.

Theoretical background: the Grossman's model

The standard conceptual framework for analyzing the demand for health and health investment: Grossman (1972; 2000).

- The stock of health depreciates with age (at an increasing rate in old age), but it can be increased by investment in health inputs (e.g. medical care utilization, diet, exercise, no smoking/drinking).
- Individuals invest in health (medical care, healty life-styles) for both 'consumption' (health provides utility) and 'production' motives (healthy individuals have higher earnings).
- There is no retirement.

$\Rightarrow$ Health care utilization is expected to increase smoothly with the aging process, until it becomes too costly doing so: death occurs when the health stock falls below a given threshold.

Theoretical background: Galama et al. (2013)

Galama et al. (2013) extended Grossman's model to retirement decision.

- Upon retirement the 'optimal' level of the health stock may be discontinuous (corner solution).
- After retirement health only provides consumption benefits. Production benefits disappear since retirement income is independent from the health stock $\Rightarrow$ individuals reallocate away from health expenditures towards more goods consumption.

$\Rightarrow$ Health investments are expected to be discontinuous upon retirement: this is what we investigate in this paper.

Empirical evidence: consumption patterns

The literature has evidenced a 'retirement-consumption puzzle': consumption significantly decreases upon retirement (Banks et al, 1998 ; Battistin et al., 1997).

Recent papers suggest that the drop in consumption following retirement is due to substitution across categories of goods.

- Consumption shifts from work-related goods (e.g. clothes, transportation) that are bought on the market, toward time-intensive consumption goods (e.g. recreation, sports, cooking etc.) that are home-produced (Aguila et al., 2011; Miniaci et al., 2010).
- This is optimal since the opportunity cost of leisure decreases.

$\longrightarrow$ In this paper, we investigate how health-care utilization varies upon retirement.

In this paper

We provide causal evidence of the effect of retirement on health care utilization (i.e. the use of medical care services) taking into account the potential endogeneity of retirement.

Using SHARE data, we show that:

- The number of doctor's visits increases at the time of retirement and this increase is driven by visits to the GP's as opposed to specialists'.
- This effect is larger for individuals who used to work long hours when employed.

⇒This suggests that at least part of the increase in medical care use following retirement is due to the decrease in the opportunity cost of time.

Related Literature

Only a limited number of studies have addressed the issue of health care utilization after retirement.

They yield quite mixed results:

- Using respectively US and German data, Gorry et al. (2015) and Eibich (2014) hardly find any significant impact of retirement on health care utilization.
- Regarding Europe, Celidoni and Rebba (2015) do not find any effect of retirement on doctor's visits.
- In contrast, Coe and Zamarro (2015) show that the number of doctor's visits decreases when individuals transit from employment to retirement, unemployment or inactivity.

$\longrightarrow$ We focus on EU countries and on retirement strictly speaking. We show that medical care use increases when individuals retire, and that at least part of this increase is due the sharp reduction in the opportunity cost of time taking place at retirement.

Empirical Strategy

As a starting point, we estimate the effect of retirement on medical care use with a Fixed-Effect model of the form:

$$V_{it} = \gamma R_{it} + X'_{it}\beta_1 + H'_{it}\beta_2 + \alpha_i + u_{it} \qquad (1)$$

where

- V_{it} is the number of doctor's visits in the past 12 months;
- R_{it} is the retirement status of individual i at time t;
- X_{it} is a vector of demographic and job characteristics including individual's age;
- H_{it} is a vector of individual health controls (poor self-rated health, diagnosed conditions and mental health status);
- α_i is the individual fixed-effect (including country fixed-effects);

IV Strategy

Retirement may be endogenous ⇒ we estimate a Fixed-Effect Instrumental Variable model.

Identification strategy: we exploit the fact that as individuals reach legal retirement age, the financial incentive they have to retire strongly increases. This generates a discontinuity in the probability of retirement when individuals reach Early and/or Official Retirement Ages in their country of residence.

Our instrument Z_{ict} is defined as:

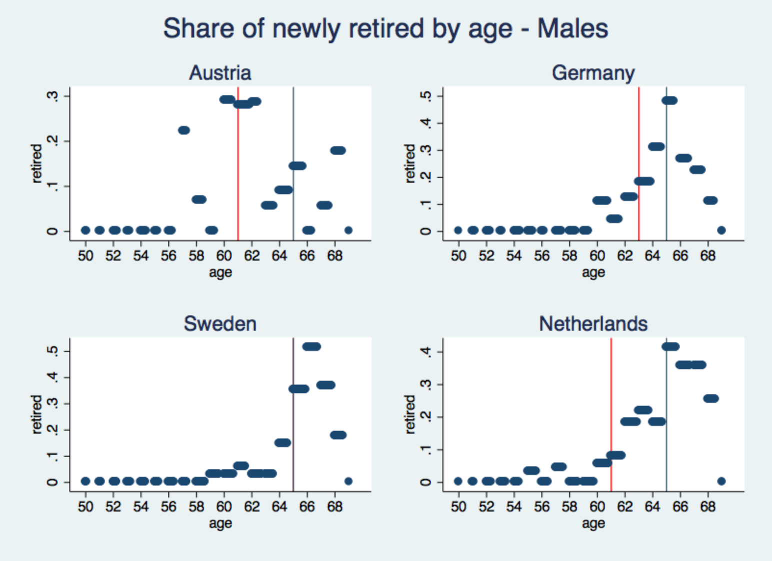
$$Z_{ict} = 1 \qquad if \qquad age_{it} > ERA/ORA_{c,t}$$

where

- ERA_{ct} is the minimum statutory age at which individuals can claim pension benefits in country c, in year t
- ORA_{ct} is the age at which workers are eligible for full old-age pension in country c, in year t.

Share of newly retired by age across countries

Some examples



Share of newly retired by age across countries

Some examples

Data

Survey of Health, Ageing and Retirement (SHARE), 4 waves (2004, 2006, 2011 and 2013), 10 countries (AT,BE, CH, DE, DK, ES, FR, IT, NL and SE).

- longitudinal data
- info on demographics, employment and socio-economic status
- detailed info on health and health care utilization

Sample definition:

- individuals aged 50-69, either employed or retired in each wave;
- except individuals permanently living in nursing homes and retired because of ill health;
- only subjects observed for at least two consecutive waves;

⇒ final sample **2,883** individuals (9,266 observations)

Data

Doctor's visits

"About how many times in total have you seen or talked to a medical doctor about your health (last 12 months)? "

- dentist visits and hospital stays are excluded, but emergency room or outpatient clinic visits are included.
- we also derive a measure of "high intensity" in the use of medical care (i.e. binary indicator for >4 visits)
- up to the 4th wave, SHARE provides a break-down of the total number of visits between general practitioner's and specialist's visits, used for robustness checks.

Retirement

dummy variable taking value 1 if individual i reports to be retired at time t and 0 otherwise.

- **33%** of individuals retire across waves, **35%** are retired in all waves and **30%** are always employed.

Data

In our empirical analysis we also include a set of controls for:

- **demographic characteristics** (age, education, marital status, household size and having children);
- **occupation and industry**;
- **household income** and ability to make ends meet;
- **health status** (poor self-rated health, diagnosed conditions and an index of poor mental health);

Descriptive statistics

Descriptive statistics

Variables	*Whole sample*	*Employed*	*Retired*
Demographics			
Age	60.8	57.8	64.3
Females	0.48	0.50	0.46
Males	0.52	0.50	0.54
Primary/Lower-secondary education	0.30	0.25	0.36
Secondary and upper-secondary education	0.36	0.36	0.36
Tertiary education	0.34	0.39	0.28
Living with a spouse or partner	0.77	0.77	0.78
Household size	2.2	2.3	2.0
Having at least 1 child	0.91	0.90	0.91
Health status			
Poor self-rated health	0.16	0.12	0.20
Diagnosed conditions (total)	0.99	0.80	1.22
Depression index (1-12)	1.68	1.67	1.69
Mean doctor's visits (median)	3.81 (3)	3.23(2)	4.47(4)
More than 4 visits	0.31	0.24	0.38
N.	9,266	4,953	4,313

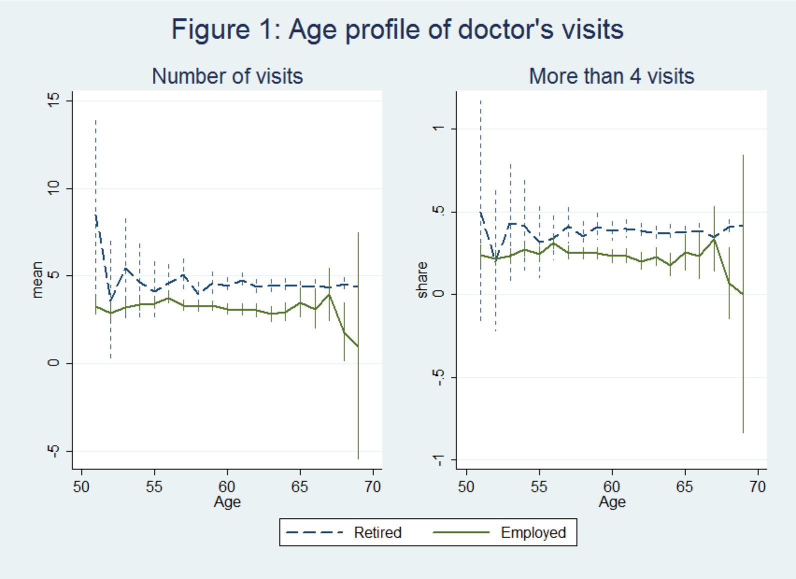


Figure 1: Age profile of doctor's visits
Number of visits
mean
15
10
5
0
-5
50
55
60
65
70
Age
More than 4 visits
share
1
.5
0
-.5
-1
50
55
60
65
70
Age
Retired
Employed

Results

Pooled OLS

Doctor's visits and retirement status - Pooled OLS

	Number of visits			*More than 4 visits*		
	(1)	(2)	(3)	(4)	(5)	(6)
retired	0.572***	0.604***	0.430***	0.0653***	0.0678***	0.0496***
	(0.124)	(0.124)	(0.108)	(0.0154)	(0.0154)	(0.0141)
age	0.0370***	0.0412***	0.00209	0.00390**	0.00453***	0.000427
	(0.0140)	(0.0140)	(0.0123)	(0.00169)	(0.00170)	(0.00156)
female	0.648***	0.555***	0.331***	0.0693***	0.0575***	0.0327***
	(0.102)	(0.114)	(0.102)	(0.0122)	(0.0134)	(0.0124)
poor health			1.642***			0.180***
			(0.130)			(0.0157)
diagnosed conditions (sum)			0.927***			0.0966***
			(0.0430)			(0.00518)
depression index			0.154***			0.0176***
			(0.0258)			(0.00309)
constant	0.610	0.491	1.494*	-0.0586	-0.0599	0.0439
	(0.899)	(0.923)	(0.804)	(0.109)	(0.113)	(0.104)
Demographics	✓	✓	✓	✓	✓	✓
Industry and Occupation		✓	✓		✓	✓
Income		✓	✓		✓	✓
Wave and Country dummies	✓	✓	✓	✓	✓	✓
R^2	0.0962	0.103	0.238	0.0721	0.0771	0.172
N	9,266	9,266	9,266	9,266	9,266	9,266

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01.

Fixed-Effects model

Doctor's visits around retirement - Fixed-Effects

	Number of visits			*More than 4 visits*		
	(1)	(2)	(3)	(4)	(5)	(6)
retired	0.276**	0.283**	0.279**	0.0359**	0.0368**	0.0364**
	(0.124)	(0.125)	(0.121)	(0.0172)	(0.0173)	(0.0170)
age	0.0585***	0.0602***	0.0395***	0.00646***	0.00689***	0.00452***
	(0.0125)	(0.0128)	(0.0125)	(0.00165)	(0.00170)	(0.00169)
poor health			1.153***			0.125***
			(0.144)			(0.0187)
diagnosed conditions (sum)			0.536***			0.0615***
			(0.0572)			(0.00751)
depression index			0.125***			0.0141***
			(0.0297)			(0.00384)
Demographics	✓	✓	✓	✓	✓	✓
Industry and Occupation		✓	✓		✓	✓
Income		✓	✓		✓	✓
Individual fixed-effects	✓	✓	✓	✓	✓	✓
N	9,266	9,266	9,266	9,266	9,266	9,266

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01.

Fixed-Effects IV

Doctor's visits around retirement - FE-IV

	Number of visits			*More than 4 visits*		
	(1)	(2)	(3)	(4)	(5)	(6)
retired	0.552*	1.146***	0.713***	0.0498	0.145**	0.0755*
	(0.300)	(0.431)	(0.272)	(0.0424)	(0.0606)	(0.0392)
age	0.0245	-0.00811	0.0157	0.00379	-0.00143	0.00238
	(0.0202)	(0.0258)	(0.0187)	(0.00275)	(0.00362)	(0.00260)
poor health	1.154***	1.157***	1.155***	0.125***	0.126***	0.125***
	(0.144)	(0.144)	(0.144)	(0.0186)	(0.0187)	(0.0186)
diagnosed conditions (sum)	0.533***	0.527***	0.531***	0.0614***	0.0604***	0.0611***
	(0.0569)	(0.0572)	(0.0570)	(0.00749)	(0.00750)	(0.00748)
depression index	0.127***	0.131***	0.128***	0.0142***	0.0149***	0.0144***
	(0.0297)	(0.0300)	(0.0298)	(0.00385)	(0.00389)	(0.00385)
Demographics	✓	✓	✓	✓	✓	✓
Industry and Occupation	✓	✓	✓	✓	✓	✓
Income	✓	✓	✓	✓	✓	✓
Individual fixed-effects	✓	✓	✓	✓	✓	✓
First stage results						
Above ERA	0.368***		0.315***	0.368***		0.315***
	(0.0145)		(0.0152)	(0.0145)		(0.0152)
Above ORA		0.262***	0.159***		0.262***	0.159***
		(0.0149)	(0.0146)		(0.0149)	(0.0146)
R^2	0.4282	0.3796	0.4458	0.4282	0.3796	0.4456
F-stat of excluded instruments	642.48	311.58	415.44	642.48	311.58	415.44
N	9,266	9,266	9,266	9,266	9,266	9,266

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01.
Hansen J statistic for overidentification is 1.668 ($p = 0.1965$) for column 3 and 2.345 ($p = 0.1257$) for column 6.

Fixed-Effects IV

Doctor visits around retirement and long pre-retirement hours worked

Doctor's visits around retirement and pre-retirement hours worked - FE-IV

	Number of visits		*More than 4 visits*	
	(1)	*(2)*	*(3)*	*(4)*
retired	0.594**	0.593**	0.0572	0.0607
	(0.283)	(0.287)	(0.0411)	(0.0416)
$\geq$ 48hours	-0.138		-0.0327	
	(0.170)		(0.0240)	
retired $\times \geq$ 48hours	1.004**		0.174***	
	(0.407)		(0.0620)	
5^{th}quintile[a]		-0.150		-0.0323
		(0.168)		(0.0238)
retired$\times 5^{th}$quintile		0.877**		0.128**
		(0.377)		(0.0589)
N	9,266	9,266	9,266	9,266

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. All results are obtained using the full set of controls. Retirement is instrumented with both ERA and ORA.

First-stage statistics confirm both the relevance and the validity of the instruments.

[a] Quintiles of weekly hours worked.

Fixed-Effects IV

Introducing gender differences

Doctor's visits around retirement and pre-retirement hours worked - Gender differences - FE-IV

	Number of visits			*More than 4 visits*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
retired	1.307***	1.175***	1.179***	0.132***	0.108**	0.114**
	(0.316)	(0.331)	(0.335)	(0.0443)	(0.0468)	(0.0474)
retired×female	-1.272***	-1.198***	-1.205***	-0.122***	-0.108**	-0.111**
	(0.297)	(0.299)	(0.300)	(0.0433)	(0.0435)	(0.0437)
$\geq$ 48hours		-0.106			-0.0298	
		(0.171)			(0.0240)	
retired× $\geq$ 48hours		0.742*			0.151**	
		(0.414)			(0.0625)	
5^{th}quintile			-0.110			-0.0286
			(0.169)			(0.0239)
retired×5^{th}quintile			0.632*			0.106*
			(0.383)			(0.0593)
N	9,266	9,266	9,266	9,266	9,266	9,266

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. All results are obtained using the full set of controls. Retirement is instrumented with both ERA and ORA.

Fixed-Effects IV

GP and Specialist visits

Number of General practitioner's and Specialist's visits - FE-IV

	General Practitioner		*Specialist*	
	(1)	*(2)*	*(3)*	*(4)*
retired	0.254	0.272	0.0771	0.0713
	(0.268)	(0.272)	(0.0590)	(0.0596)
$\geq$ 48hours	-0.137		0.0275	
	(0.151)		(0.0333)	
retired$\times \geq$ 48hours	1.056**		0.00406	
	(0.416)		(0.0833)	
5^{th}quintile		-0.216		0.0248
		(0.142)		(0.0324)
retired$\times 5^{th}$quintile		0.825**		0.0111
		(0.392)		(0.0815)
N	7,486	7,486	7,486	7,486

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. All results are obtained using the full set of controls and the restricted sample from waves 1, 2 and 4. Retirement is instrumented with both ERA and ORA.

First-stage statistics confirm the relevance of the instruments. However, the overidentification test for both equations of GP visits is rejecting the null at the 10% level.

Robustness checks

We performed a number of robustness checks:

1. **different specifications**
    - adding non linearities in age
    - including individuals who retired because of ill health
    - excluding health controls
    - adding country-specific time and age trends
2. **alternative definitions of retirement**
    - using year and month of retirement
    - using self-reported retirement status but excluding those who performed any paid work during the two weeks preceding the interview
3. **different samples**
    - excluding one country at a time

Robustness

Introducing non linearity in age (1)

Introducing non-linearity in age FE-IV

	Doctor's Visits					
	$\geq 48hours$			5^{th} *quintile*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
retired	0.423	0.655*	0.614	0.421	0.655*	0.614
	(0.334)	(0.365)	(0.384)	(0.338)	(0.369)	(0.388)
$\geq$ 48hours	-0.138	-0.151	-0.151			
	(0.170)	(0.170)	(0.170)			
retired$\times \geq$ 48hours	1.040**	0.980**	0.986**			
	(0.407)	(0.411)	(0.411)			
5^{th}quintile				-0.151	-0.165	-0.165
				(0.168)	(0.168)	(0.168)
retired$\times 5^{th}$quintile				0.916**	0.848**	0.855**
				(0.377)	(0.381)	(0.381)
age	-0.196	6.510**	30.36	-0.196	6.530**	30.20
	(0.189)	(3.135)	(47.16)	(0.189)	(3.136)	(47.15)
age^2	0.00184	-0.111**	-0.719	0.00184	-0.111**	-0.715
	(0.00166)	(0.0526)	(1.204)	(0.00166)	(0.0526)	(1.203)
age^3		0.000628**	0.00749		0.000630**	0.00744
		(0.000292)	(0.0136)		(0.000292)	(0.0136)
age^4			-0.0000290			-0.0000287
			(0.0000575)			(0.0000575)
N	9,266	9,266	9,266	9,266	9,266	9,266

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. All results are obtained using the full set of controls. Retirement is instrumented with both ERA and ORA.

First-stage statistics confirm both the relevance and the validity of the instruments.

Robustness

Introducing non linearity in age (2)

Introducing non-linearity in age FE-IV

	More than 4 Visits					
	$\geq$ *48hours*			5^{th} *quintile*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
retired	0.0329	0.0715	0.0760	0.0361	0.0755	0.0801
	(0.0476)	(0.0521)	(0.0544)	(0.0481)	(0.0526)	(0.0549)
$\geq$ 48hours	-0.0327	-0.0349	-0.0350			
	(0.0239)	(0.0240)	(0.0240)			
retired$\times \geq$ 48hours	0.179***	0.169***	0.169***			
	(0.0622)	(0.0625)	(0.0626)			
5^{th}quintile				-0.0325	-0.0348	-0.0348
				(0.0238)	(0.0238)	(0.0238)
retired$\times 5^{th}$quintile				0.134**	0.122**	0.121**
				(0.0591)	(0.0595)	(0.0596)
age	-0.0277	1.078**	-1.684	-0.0278	1.090**	-1.746
	(0.0261)	(0.441)	(6.611)	(0.0261)	(0.441)	(6.609)
age^2	0.000260	-0.0183**	0.0521	0.000261	-0.0185**	0.0537
	(0.000228)	(0.00739)	(0.169)	(0.000228)	(0.00740)	(0.169)
age^3		0.000104**	-0.000691		0.000105**	-0.000711
		(0.0000410)	(0.00191)		(0.0000411)	(0.00191)
age^4			0.00000335			0.00000344
			(0.00000806)			(0.00000805)
N	9,266	9,266	9,266	9,266	9,266	9,266

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. All results are obtained using the full set of controls. Retirement is instrumented with both ERA and ORA.
First-stage statistics confirm both the relevance and the validity of the instruments.

Robustness

Enlarged sample

Alternative sample (including individuals retired for health reasons) - FE-IV

	Number of visits		*More than 4 visits*	
	(1)	*(2)*	*(3)*	*(4)*
retired	0.409	0.404	0.0480	0.0511
	(0.295)	(0.299)	(0.0424)	(0.0429)
$\geq$ 48hours	-0.144		-0.0325	
	(0.171)		(0.0240)	
retired $\times \geq$ 48hours	1.027**		0.164***	
	(0.411)		(0.0615)	
5^{th}quintile		-0.155		-0.0321
		(0.169)		(0.0239)
retired$\times 5^{th}$quintile		0.918**		0.121**
		(0.382)		(0.0585)
N	9,721	9,721	9,721	9,721

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. All results are obtained using the full set of controls. Retirement is instrumented with both ERA and ORA.

First-stage statistics confirm both the relevance and the validity of the instruments.

Robustness
No health controls

Doctor's visits around retirement - No health controls - FE-IV

	Number of visits		*More than 4 visits*	
	(1)	*(2)*	*(3)*	*(4)*
retired	0.561*	0.554*	0.0535	0.0564
	(0.292)	(0.295)	(0.0418)	(0.0423)
$\geq$ 48hours	-0.145		-0.0336	
	(0.175)		(0.0243)	
retired $\times \geq$ 48hours	1.000**		0.174***	
	(0.425)		(0.0641)	
5^{th}quintile		-0.148		-0.0321
		(0.172)		(0.0241)
retired$\times 5^{th}$quintile		0.896**		0.130**
		(0.394)		(0.0606)
N	9,266	9,266	9,266	9,266

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. All results are obtained using the full set of controls except for health controls. Retirement is instrumented with both ERA and ORA.
First-stage statistics confirm both the relevance and the validity of the instruments.

Robustness

Alternative definitions of retirement

Alternative definitions of retirement FE-IV

	Number of visits		*More than 4 visits*	
	(1)	*(2)*	*(3)*	*(4)*
Panel A - *Year/month of retirement*				
retired[a]	0.515*	0.513*	0.0579	0.0606
	(0.268)	(0.270)	(0.0393)	(0.0396)
$\geq$ 48hours	-0.0816		-0.0349	
	(0.173)		(0.0250)	
retired$\times \geq$ 48hours	0.860**		0.145**	
	(0.412)		(0.0630)	
5^{th}quintile		-0.0908		-0.0326
		(0.169)		(0.0245)
retired$\times 5^{th}$quintile		0.780**		0.117*
		(0.387)		(0.0599)
N	8,730	8,730	8,730	8,730
Panel B - *Self-reported retirement and no work performed*				
retired [b]	1.085**	1.065**	0.127**	0.126**
	(0.424)	(0.426)	(0.0610)	(0.0613)
$\geq$ 48hours	-0.157		-0.0356	
	(0.179)		(0.0245)	
retired$\times \geq$ 48hours	1.080		0.252**	
	(0.791)		(0.121)	
5^{th}quintile		-0.168		-0.0349
		(0.177)		(0.0245)
retired$\times 5^{th}$quintile		1.114		0.239**
		(0.747)		(0.115)
N	7,821	7,821	7,821	7,821

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. All results are obtained using the full set of controls. Retirement is instrumented with both ERA and ORA.

Robustness

Alternative sample and specifications

Alternative sample and specifications - coefficient on the interaction between *retirement* and long hours worked - FE-IV

	≥ 48***hours***	5^{th} ***quintile***	Obs.
Panel A - *Doctor's visits*			
1. Drop countries:range [min;max][a]	[0.856**-1.187***]	[0.765**-1.003**]	[7,990-9,333]
2. Country-specific time trends	1.009**	0.905**	9,266
	(0.400)	(0.370)	
3.Country-specific age trends	1.006**	0.904**	9,266
	(0.401)	(0.371)	
Panel B - *More than 4 visits*			
1. Drop countries:range [min;max][a]	[0.132** - 0.201***]	[0.0912 -0.144**]	[7,990-9,333]
2. Country-specific time trends	0.176***	0.132**	9,266
	(0.0618)	(0.0585)	
3.Country-specific age trends	0.175***	0.131**	9,266
	(0.0616)	(0.0584)	

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. Retirement is instrumented with both ERA and ORA.
[a] The range of estimates is obtained excluding one country at a time from our preferred specification.

Conclusions

In this paper we have shown that health care utilization increases at the time of retirement. Due to the decrease in the opportunity cost of time.

- Larger effect for individuals who used to work long hours
- Driven by males rather than females
- Driven by GP's rather than specialist's visits

Interpretation?

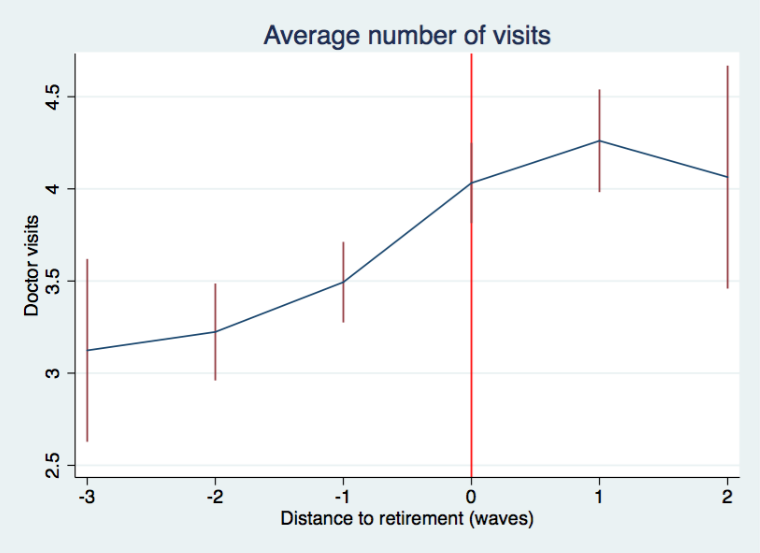
- Change in the optimal amount of health care utilization upon retirement
- Individuals no longer rationed in terms of leisure time after retirement

Thank you for your attention!

Excluding movers long hours

	Number of visits		*More than 4 visits*	
	(1)	*(2)*	*(3)*	*(4)*
retired	0.684**	0.690**	0.0692	0.0737*
	(0.298)	(0.302)	(0.0430)	(0.0435)
$\geq$ 48hours	-0.180		-0.0377	
	(0.188)		(0.0270)	
retired $\times \geq$ 48hours	0.973**		0.173***	
	(0.410)		(0.0621)	
5^{th}quintile		-0.199		-0.0383
		(0.186)		(0.0267)
retired$\times 5^{th}$quintile		0.849**		0.126**
		(0.387)		(0.0599)
N	9,266	9,266	9,266	9,266

Robust standard errors in parentheses, clustered at the individual level. Significance: * p<.1, ** p<.05, *** p<.01. All results are obtained using the full set of controls. Retirement is instrumented with both ERA and ORA.


Average number of visits
Doctor visits
4.5
4
3.5
3
2.5
-3
-2
-1
0
1
2
Distance to retirement (waves)